Design for Narrative Experience in Product Interactions

Silvia Grimaldi

A Thesis submitted in partial fulfilment of the requirements for the degree of PhD at the University of the Arts London

July 2018

Table of Contents

List of Figures

List of Tables

Acknowledgements

A particular thank you to my mother, Elaine Luti, who actually read the whole PhD to point out all the grammar problems, colloquialisms, repetitions, and areas that didn't make sense. Only a mother would do that for free!

And last but not least thank you to my father Michele and brother Luca, my husband Rob, my daughter Clara who won't remember a time before I was a PhD student, and my son Dario, who was born half way through it, for encouraging me throughout.

Abstract

This practice-led investigation asks if and how design can enhance the user's experience of interacting with everyday physical domestic objects through the application of narrative storytelling devices derived from film.

The concepts of tellability and narrativity are used to explore the way people interpret interactions with objects and to develop methods for product designers to integrate narrativity into the product experience of mundane objects, things we use every day, objects which are often overlooked.

The interest of the design community in experience and interaction design has tended to focus on digital products or interfaces because these fields emerged in large part from computer science in the area of Human Computer Interaction. By contrast, this investigation draws attention to the way users can also have meaningful and interesting interactions with tangible non-digital products.

Since interactions with products happen over time, the concept of narrative is useful to help envision how experiences will unfold. Narratives are used in everyday life to communicate, engage others, and interpret our experiences. Narrative is closely tied to memory and we tend to remember information better when this is presented in narrative form. This research focuses on how products can prompt or reveal a narrative through their use, and how the designer of a product can embed qualities that enhance the narrativity of the user experience.

This research develops design work, a set of domestic kettles, specifically to address the area of design praxeology, or research into the process of designing, so that in the first instance its direct audience is product designers, in particular those designers working within speculative design and product design research. However, the scope of the study has also produced approaches and design methods applicable to product design for mass production and design for social impact.

Introduction. Why look at narrative in product design?

0.0 Introduction

This research originated from the reflection on a Master's Thesis and Major Project on Surprise, and how this emotion can be used by designers to create memorable product experiences. After further reflection, the thesis was reworked through a conference paper (Grimaldi, 2006) and following that a book chapter (Grimaldi, 2008). Throughout this iteration, the focus shifted from an initial interest in how this element of surprise as an emotion could be designed into products, to an interest in how surprise can create imaginative engagement within an experience, how it structures the experience over time, and how the user tends to retell the surprising experience in narrative terms (Grimaldi, 2017). This led to investigating the ways in which narrative shapes the user's interpretation of a product experience, identifying what narrative elements from other mediums could be applied to product design, with the aim of designing a product focussing on the narrative of the product experience.

This formed into the research question:

*Can design enhance the user's experience of interacting with a
non-digital product through the application of narrative devices
derived from film?*

The focus developed into an inquiry about how people interpret interactions with products through narrative. When a user engages with a product, the resulting product experience can be interpreted in a more or less narrative manner. The narrative qualities of the product experience and of the product are described in this research using the concepts of narrativity and tellability.

Narrativity is a quality of narratives, and is often used to refer to how "storylike" the text or media is; it is a term that is particularly relevant in transmedia narratology as it is applicable to non-traditional narrative media such as art, games and conversations (Abbott, no date; Herman, 2004). Narrativity is used in this thesis to

indicate the narrative quality of the user's interpretation of a product experience (through in-the-moment interpretation, memory or retelling).

Tellability refers to "the features that make a story worth telling" (Baroni, 2013, p. 1), and the noteworthiness of the events being told (Baroni, 2013). Tellable events are easier to make into interesting or more story-like narratives, narratives that show more narrativity. Tellability is used throughout this thesis to refer to the qualities of the product which encourage the user to form a narrative interpretation of the related product experience, or in other words the *potential narrativity* of the product.

The concepts of narrativity and tellability, and the related concepts of agency, emotion, schemata, memory, identity, and reflection, form the theoretical basis of the investigation into the tellability of domestic objects. This results in methods for product designers to "direct" the narrativity in the user experience.

User experience with products is not only researched in the field of product design, but it is a particularly relevant subject of interaction design research, though interaction design focusses primarily on digital products. In the last fifteen years there has been a trend towards humanising interaction design by looking beyond the technological realm and exploring the practice within a cultural sphere (Bardzell, 2011), in relation to non-digital objects (Gaver, 2006; Hassenzahl, 2010) and within narrative contexts (Forlizzi and Ford, 2000; Blythe and Wright, 2006; McCarthy and Wright, 2010). This has coincided with a re-evaluation of the role of the product designer, who moved away from focusing primarily on the form of products, and moved towards exploring different ways of interacting with users. Of particular interest to this thesis are the moves towards addressing the effects of product design on societal assumptions and individual experiences through critical design (Dunne, 2008; Malpass, 2013) and addressing the user's needs through user-centred design.

The focus on users and society has led to product designers incorporating narrative techniques within the design process, to humanise user research through methods such as design ethnographies and cultural probes (W. Gaver, Dunne and Pacenti, 1999), and to aid creativity and communication within the design process through methods such as design fiction and fictional inquiry (Dindler and Iversen, 2007; Markussen and Knutz, 2013).

However, the role of narrative as a way of interpreting the user experience with a non-digital product has not been investigated in depth within design research. To address this gap, this research suggests two related strategies. Focussing on the product experience implies looking at the literature on user experience design and interaction design, but applying it within a non-digital, product design context. Focussing on the narrative interpretation of this experience implies the analysis of product experiences over time, investigating how the interpretation of the experience might be governed by narrative principles.

Several papers have specified the need for a time-based approach to experience; Djajadiningrat outlined the need to look at interaction as a process that unfolds over time (Djajadiningrat, Gaver and Fres, 2000; Löwgren, 2009); Löwgren analysed interaction design in terms of dramaturgy (Löwgren, 2009). Forlizzi and Ford talk about "experience as story" (Forlizzi and Ford, 2000, p.420) and underline the growing interest in the user experience, but state that "very little has been done to demystify the idea of 'designing the user experience' and how interaction design and product design achieve specific user experience goals" (Forlizzi and Ford, 2000, p.419). These examples show that there has been research within the design fields on user experience and its relationship to narrative; however, the focus is mostly theoretical and a posteriori analysis, and not primarily on generative methods for designing narrative into the user experience.

Key concepts from product design and narrative theory were used to investigate the research question. In product design theory, there has been interest in moving away from discussing the physical object itself and towards discussing the user's experience of interacting with the object, which develops over time (Forlizzi and Ford, 2000; Desmet and Hekkert, 2007). Narrative Theory was used because time-based events are necessarily described, but also remembered and interpreted as a story, in narrative form (Bruner, 1991; Forlizzi, 1997; Dewey, 2005; Hassenzahl, 2010). Narrative plays a central role in the way we organise and remember experiences (Forlizzi and Ford, 2000; Young and Saver, 2001; Abbott, 2008). It evokes more meaning, emotion and empathy than a series of facts (Lloyd, 2000; Wright and McCarthy, 2008; Steffen, 2009), and is central to the formation of our sense of self (Sacks, 1998; Young and Saver, 2001; Michele L Crossley, 2002). Narratives such as those found in films or novels are particularly effective in creating engaging and memorable experiences (Bordwell, 1985; McKee, 1999). Thus, it makes sense to investigate methods which product designers can use narrative to "direct" the way a product experience may unfold over time (Forlizzi,

1997; Löwgren, 2009; McCarthy and Wright, 2010; Steven Fokkinga and Desmet, 2012; Grimaldi, 2013, 2015).

0.1 Research Design and Methodological Approach

The methodological approach to this research has been to build frameworks and frames of reference that allow to move from the field of narrative theory and design theory into design practice.

Because my MA was the start of my interest in this space, I built on the background to this research to position the PhD in an epistemological space. Products are looked at through the lens of emotional design and product experience, as well as within the context of interaction design and HCI. In addition, how meaning is attached to products, and the agency of the product, were looked at through the lenses of sociology and anthropology.

The Practice Review in Chapter 1 (p. 31) draws together examples of design that are described by the designers or by other theorists as being in some way narrative. The examples cited are drawn from a database put together through a workshop with Steven Fokkinga and Ioana Ocnarescu at TU Delft in 2013, at which we each brought those examples from our PhD research that were identified as narrative by the designers themselves or in other theoretical papers (Grimaldi, Fokkinga and Ocnarescu, 2013). Out of this review two frameworks were built, one identifying why narrative is used in design and the effects that the use of narrative has on the user or designer (Narrative Functions), and one describing ways in which narrative is used in design (Typology of Narrative Use in Design). The Typology of Narrative Use in Design also validated a gap in knowledge about this particular use of narrative in design.

The Literature Review in Chapter 2 (p. 51) builds two frameworks. The Framework of Narrative Product Experience by expanding on Desmet and Hekkert's Framework of Product Experience (Desmet and Hekkert, 2007), conceptualising product experiences as narrative experiences. Product experiences are put in relation to their narrative interpretation, drawing upon the literature on product experience, interaction design and experience design (Forlizzi and Ford, 2000; Desmet and Hekkert, 2007; Löwgren, 2009). This focusses on the ways in which products are interpreted by the user, through emotions, affordances, meaning,

aesthetics, and interaction, and takes as a starting point the idea that as product experiences happen through time, they form an implicit narrative. Emotions are looked at through a psychology, neurology and emotional design approach (Damasio, 2000; Desmet, 2002; Norman, 2003; Ekman, 2014). Affordances, meaning, aesthetics and agency are looked at through sociological and anthropological lenses (Csikszentmihalyi, 1981; Gell, 1998; Miller, 2001, 2008; Bourdieu, 2010). Ideas of narrative are looked at primarily through cognitive narratology, as it allows to focus on the interpretation of the product experience in narrative form, as well as the production of meaning through this experience (Bordwell, 1985; Bruner, 1991; Bal, 1997, 2002; Young and Saver, 2001; Ryan, 2005). The focus is on the narrative that the user creates when interacting with a product, either in terms of in-the-moment interpretation, or in terms of memory or retelling the experience. The Narrative Definitions framework synthesise elements of narrative theory from the literature review into a series of definitions of narrative, based on the essential elements that are needed to create a narrative, in order to identify elements that could be used by designers.

Film is used as an example of a narrative medium in order to build a number of design case studies that are informed by narrative. The methodology develops two strands in parallel. Firstly, kettles are identified as an everyday object that has potential for being used as an example in this research (Section 3.3.1, p. 97), and the "typical" product experience of a kettle is mapped through design ethnography research (Section 3.3.3, p. 102). At the same time, a number of films in which kettles appear in a significant role are identified and analysed to outline the role of the kettle in the film and the ways in which it informs the film narrative (Section 3.3.2, p. 98). The analysis of the films and the kettle analysis are used to create design briefs, focussing on the content of the film, and the role the product plays in that film, to inject the product designed with narrative meaning (Section 4.1.1 p. 126, and Section 4.3.1, p. 173).

A first round of design practice work addresses briefs that come out of the film analysis, using the narrative frameworks as a design method (Section 4.1, p. 126). This design method is codified into the Narratives in Design Toolkit (Section 4.2, p.146) and two prototypes, K1 and K2, are developed. The Narratives in Design Toolkit is also tested with design students at different levels to see how it functions as an analytical and generative tool. This toolkit helps designers to focus on the narrative structures, sequences of events and narrative qualities that might be designed into the user experience of the product and facilitates designers to design

for narrativity of the product experience, or to design products that are more tellable. A second round of design practice work used a second version of the Narratives in Design Toolkit and produced two more prototypes, K3 and K4 (Section 4.3, p. 173).

Finally, the designed prototypes were tested with users (Section 5.1, page 195) and the results were qualitatively analysed, analysing the users' accounts of the product experience for "markers of narrativity", to determine what types of narratives were prompted by the different prototypes (Section 5.2, p. 204, and Section 5.3, p. 209). The prototypes were found to activate different types of narratives than those prompted by the users' own products; these accounts showed the users engaged with the prototypes and created product narratives that were sparked by associations within the prototypes, engaging memories and storyworlds, engaged emotionally as a response to the interactions, and assigned agency to the prototypes. In addition, the prototypes were found to "direct" or structure user experience over the duration of the interaction (Section 5.3, p. 209 and Section 5.4, p. 230).

The research confirmed the initial hypothesis, that designers can harness narrative elements from other mediums to create products that direct the user experience, in order to enhance their narrative interpretation (Section 6.2, p. 239). The Narratives in Design Toolkit makes the methods transparent and applicable by other designers.

chapter   actions   output   conclusions brought forward

Practice Review

review examples of narrative in design

Narrative Functions

Typology of Narrative Use

NF1-9   why

T1.1-3.1   who, where, when

gap in knowledge

Literature Review

review definitions of narrative

Narrative Definitions

D1-5   what

review literature on product experience

Framework of Narrative Product Experience

design parameters

review literature on narrative interpretation

identify key concepts

K - Key concepts

Metholodlogy

research question and hypothesis

product selection

experience analysis

microevents in the interaction

film selection

film analysis

briefs

Design Practice

design K1 and K2

prototype K1 and K2

Narratives in Design Toolkit V1

test Toolkit

revise Toolkit

design K3 and K4

prototype K3 and K4

Narratives in Design Toolkit V2

Testing and Analysis

Test K1-K4 prototypes

Qualitative Analysis

Markers of Narrativity

Discussion and Conclusions

findings

contributions to the knowledge

classifications and frameworks

tellability as applied to products

methods for design, testing and analysis

prototypes

Further Development and Applications

explorative papers applying aspects

identification of other speculative applications

Figure 1 Diagram of the research process. Author's own.

0.2 Contributions to the knowledge

There are several levels of contribution to the knowledge resulting from this research. These are described in more detail in Section 8.2 (p. 279).

Chapter 1 (p.31) creates a classification of the ways in which narratives are used in product design (Section 1.2, p. 42, Typology of Narrative Use in Design), as well as a classification of the effects of using narrative in product design (Section 1.1, p. 35, Narrative Functions). Defining and categorising ways in which narrative is used within product design makes it possible to define precisely the type of narrative use that will be within the scope of this research, and the uses that will be outside the scope of this research. Consequently, the classifications provide a framework for other designers to define the scope of narrative within their projects. These classifications identify the following gap in knowledge: how to use design as a way to structure the user's product experience over time as a narrative.

Chapter 2 (p. 51) classifies definitions of narrative that can be used in the design process (Section 2.3, p. 67, Narrative Definitions), qualifying different types of narrative that might be present in design, and the elements that constitute these narrative types. The definitions of narrative are aimed at designers, to allow enough specificity in the ways that narrative elements are defined to be meaningful in a design process, but to be simple enough to be understandable to someone not familiar with narrative theory.

Chapter 2 also creates a Framework of Narrative Product Experience (Section 2.2, p. 55). The Framework of Narrative Product Experience positions the user's narrative experience at the centre of the product experience, and focusses on the element of time in the user's interpretation of that experience. It then outlines key concepts related to narrative within product experiences, described as "markers of narrativity", which inform the ways in which these experiences can be analysed.

The classifications and framework inform the idea generation and design methodology for the practice-based aspects of the research, mapping directly onto a

number of the categories used in the idea generation process, and incorporated into the Narratives in Design Toolkit (Section 4.2, p. 146, and Section 4.4, p. 191).

The concept of tellability as applied to products.

The concept of tellability as applied to products can be seen as a contribution to the product design literature and to the field of narratology, in particular transmedia and cognitive narratology.

The fields of transmedia narratology and cognitive narratology have incorporated wider definitions of what can be seen as a narrative, diverging from the written text and including media as disparate as film, videogames, installations and fine art. Transmedia narratology is interested in "the narrative potential of media and of the modalities that they encode; how can the narrative affordances of a given medium be emulated in another medium; what is it that the narratives of a certain medium can do that others cannot" (Ryan, 2016, p. 38). From this point of view, this is the first research looking at product as a narrative medium.

In terms of contributing to the product design literature, tellability frames products as a narrative medium, containing the *potential* to elicit narrative responses in users. This implies that narrative responses can be designed for and considered as part of the product experience.

The concept of tellability can be used to establish narrative as a quality of products. Defining the concept of Tellability helps designers consider which elements of their design could elicit a narrative response, and provides a language for designers and design researchers to assess in what ways particular products are affecting the narrative interpretation, memory and retelling of their product experience.

Methods: Narratives in Design Toolkit, other design methods, testing methods and analysis methods.

The Narratives in Design Toolkit and other design methods deriving from this research contribute to the field of product design, in particular addressing the gap identified in Section 0.0 (p. 17), between the theoretical analyses of product experiences as narratives, and the lack of tools and methods that can help designers

to design for users' narrative interpretation of product experiences. These methods incorporate narrative elements into design practice, with the focus on the narrativity of the designed product. The contribution to the knowledge includes the methods that are codified into the Narratives in Design Toolkit, as well as the description of the design process in this research, applying elements from films to product design.

The Narratives in Design Toolkit provides a tool and language for designers to talk about narratives within design work, and make it easier for designers to focus on elements of narrative in the design process. Case Study 1 (Section 4.1, p. 126) and Case Study 2 (Section 4.3, p. 173) show an example of how elements of narrative theory can be used by designers to design products focusing on the narrative aspects of their product experiences.

The specific methods that lead from film examples to briefs for kettle design (Section 4.1.1, p. 126 and Section 4.3.1, p. 173), which are not included in the Narratives in Design Toolkit, could be followed as a model or adapted in other projects, and thus are identified as a further contribution to the knowledge.

The methods for testing and analysing products for narrativity contribute to the knowledge, as this type of test and analysis has not been carried out in the design literature before. This includes the methods for collecting and qualitatively analysing test data to build a picture of the narrativity of the product experience; the testing methods, to test prototypes for narrativity with participants and elicit qualitative narrative data from a product experience (Section 5.1, p. 195); and the methods used to analyse interview transcripts about product experiences through "markers of narrativity", to assess the quality of the narrative that the products elicit (Section 5.2, p. 204).

The practice-based outcomes as examples

The practice-based outcomes of the study, Kettles 1, 2, 3 and 4, are examples of how to use the design methods and what effects these may obtain (Sections 4.1.3, p. 134, Section 4.1.4, p. 139, Section 4.3.3, p. 180, and Section 4.3.4, p. 185). These are not the main contributions to the knowledge, nor the main outcomes of the research; they function as examples of how this process could be followed and to what effect.

0.3 Chapter outlines

In order for the practice-based elements of this study to contribute to the theoretical findings, the research has been designed using a systematic approach. As a consequence, the chapters in this document follow on from one another and should be read in sequence.

The Practice Review (Chapter 1, p. 31) surveys a number of examples of the use of narrative within product design practice. These examples were selected because they had already been interpreted by the designers themselves or by researchers as being narrative in nature. The examples are analysed and codified into two classifications: Narrative Functions analyses and classifies the effects that narrative has on the user or designer, why narrative is used and what effect it has; Typology of Narrative Use in Design classifies who creates and who is the audience of the narrative, and whether the narrative occurs in the design process or the user experience. These classifications make it possible to define a gap in the knowledge within the field of design research: how narrative can be used to structure the product experience over time.

The Literature Review (Chapter 2, p. 51) outlines different ways of analysing the product experience and defines a Framework of Narrative Product Experience based on Aesthetic, Meaning, Emotional and Narrative Experience. The chapter also analyses narrative theory in order to come to a number of simplified Definitions of Narrative, each of which possesses different narrative dimensions. Narrative is also analysed in terms of how it is used within cognitive processes of interpretation, leading to the definition of the concepts of Narrativity and of Tellability in product design, and how they relate to product experience. The key narrative concepts analysed in the chapter are used as "markers of narrativity" in the analysis of the product experience with the prototypes designed during this study.

The Methodology chapter (Chapter 3, p. 84) positions the research within the field of study and describes how the design methods and analysis methods are linked to the Practice and Literature Review, and are then applied to the Design Process, Testing and Analysis. Tellability is used throughout the Methodology as a key concept through which the practice work is assessed in user testing. The Narrative Functions and Typology of Narrative Use in Design deriving from the Practice Review, as well as the Definitions of Narrative outlined in the Literature Review are

used as the basis for generative design methods. These generative methods are used in conjunction with an analysis of specific product experiences, to break these down into micro-events that form the time-based product experience. Throughout the study, methods that are grounded in narrative are preferred.

Design Process, Methods and Outcomes (Chapter 4, p. 123) outlines in detail the design process that was followed throughout two case studies to arrive at four product prototypes. Case Study 1 outlines the design process and methods used to design Kettle 1 (K1) and Kettle 2 (K2) and Case Study 2 outlines the design process and methods used to design Kettle 3 (K3) and Kettle 4 (K4). In addition, the Design Process chapter describes the design, testing and analysis of the Narratives in Design Toolkit, which in its first version codifies the design methods used in Case Study 1, based on a simplified version of Narrative Functions, Typology of Use and Narrative Definitions. In its second version, the Toolkit is modified in line with the design methods used in Case Study 2, adapted following reflection on the process of Case Study 1.

Qualitative Analysis (Chapter 5, p. 195) describes how the product prototypes were tested with participants in testing sessions with semi-structured interviews. The participants' recounting of the user experience with the prototypes, as well as the recounting of their experience with other kettles they owned or used in the past, are qualitatively analysed, based on "markers of narrativity" deriving from the Practice and Literature Reviews. To assess the different types of narrativity that are present in the users' retelling, the analysis focuses on making a distinction between the kettle prototypes designed for this research and the participants' own kettles, as well as distinguishing between the four prototypes, and comparing the ways in which these markers manifest themselves in relation to the different products.

Discussion and Insights (Chapter 6, p.234) outlines the findings of the study, its validity and limitations, and discusses possible implications of the research and recommendations for further research. Further Developments and Potential Applications (Chapter 7, p. 258) outlines several ways in which this research was applied as well as possible further applications. Conclusions (Chapter 8, p. 277) answers the research question, and describes the outcome and contributions to the knowledge in detail.

0.4 Timeline of the PhD

The attached timetable helps to situate the general process of the PhD, outlining the main shifts and decisions through a summary of supervision notes, the main PhD milestones, additional training workshops attended, publications and events.

Year	Season	PhD progress – summary of supervision discussions	PhD milestones	Publications	Events	Jobs/Roles
2011	autumn	map of hypothesis; contextualisation of objects - what lens? methodology discussions; stories about "the making of the object" vs stories about the experience of the object vs. story through the object Gell - Art and Agency; Testing methods?				Course Leader and Senior Lecturer on BA (Hons) Graphic Product Innovation.
2012	spring	wrote Design and Emotion paper; interviews with experts on the role of the object in film; choose films based on objects; parameters; how to select objects and films?; Mieke Bal Travelling Concepts; concept map; questionnaire responses; participant selection; Bruner	Registration			Course Leader and Senior Lecturer on BA (Hons) Graphic Product Innovation.
2012	summer	expert interviews didn't get much; possibility of creative tool as outcome; agency of object; start map literature review; perspective on agency (Gell, Latour, Focault, feminist)?; is it critical design?; Who is the user?; design ethnography				
2012	autumn	intention-agency-narrativity framework; narrativity of product experience/interaction; unpick timing, sequence, structure; start with kettles; writing Experience Design chapter and Nordes 2013; McKee and film analysis; experience analysis; Bordwell; briefs: structural or thematic?; testing narrativity - how?	RNUAL presentation			
2013	spring	Designing Experience book chapter accepted; papers submitted Alt-CHI and Nordes; design ethnography workshop; triangulation of methods; who is pushing the story forward? object or person?; symbolic role of objects in real life; structuralist vs. meaning-based analysis; plans for confirmation		Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences. Methods for Cross-Media Fertilisation of the Design Process', in Proceedings of 8th International Design and Emotion Conference London 2012 Central Saint Martins College of Arts & Design. London.	November 2013 AHRC funded SKIP Workshop on Design Ethnography Week-long course for research students run by the Royal College of Art, University of the Arts and Kingston University. ; November 2013 – Invited presentation on the theme "How I met narrative" for the Narrative in Practice Symposium, NIP2013, London, UK. ; November 2013 – workshop at TU Delft, ID Studiolab devising a framework to analyse narrative use in design. Presentation to the ID Studiolab community.	Course Leader and Senior Lecturer on BA (Hons) Graphic Product Innovation.
2013	summer	methods for kettle ethnographers; role of objects in real life vs. film settings; scripted vs non-scripted -in film actor is the mediator; narrativity vs. fellability as 2 scales; Vera Drake; leitmotif of kettle as caring; ethnographers: micro-event mapping and common vs. quirks; matrix for the design process? theoretical propositions				
2013	autumn	confirmation literature review and writing style; practice: how to go forward?; how do you explain, methodologically, link between ethnographers, film and design?; focus on interaction as sequence of events; are these products provocations?; don't do 4 objects; chart movements of concepts on matrix; what does the matrix say about the project?; methods for design - test with others		Grimaldi, S. (2013) 'Story of use: Analysis of film narratives to inform the design of object interactions', in Nordes 2013 Experiments in Design Research. Nordes 2013, The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation.		
2014	spring	review draft and justify why the choices are made; link back/forward between theory and practice; explicitly translate theory into design process; RNUAL abstract and presentation	RNUAL Presentation	Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces. New York, NY, USA: ACM (DPPI '13), pp. 201–210.	February 2014 Dark City: Workshop on Design Fiction for Sustainability – developed with Thomas Markussen and Eva Knutz of Kolding School of Design in Denmark as part of an Erasmus+ exchange, and delivered to University of the Arts students as part of the Green Week programme.	Course Leader and Senior Lecturer on BA (Hons) Spatial Design; Senior Lecturer on Contextual and Theoretical Studies
2014	summer					
2014	autumn	confirmation draft review; don't use "increase in narrativity" as it indicates quantifiable qualities; how is narrativity assessed? closeness to prototypical narratives?; Qs for confirmation: what are contributions to the knowledge? how is this informing practice? who is audience? how will they access & benefit? what's impact of published papers?	Confirmation	Grimaldi, S. (2014) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in Benz, P. (ed.) Experience Design: Concepts and Case Studies. London: Bloomsbury Academic, pp. 57–68.	November 2014 Delivered lecture and workshops on Narratives in Design Toolkit as part of an Erasmus+ exchange with Kolding School of Design in Denmark.	
2015	spring	minor dos from confirmation; practice review; design for social impact - why suitable for this application? engaging people, communicating ideas in accessible way? conveying values?; pilot: design & prototype; how to select concepts to develop? workshop it?		Narratives in Design Toolkit, for Experience Design Journal – story track. Invited to submit by the editor for the first issue. Peer reviewed and accepted for publication.		maternity leave
2015	summer	testing kettle sketches with students - not much result; taxonomy of kettles; why change form of kettle from the film? only to make it more relevant to the concept; MLRyan - rich narratives with ambiguity and delay, more listener participation; premise: use of a kettle is a (boring) story. Aim of design: make it a more interesting story, introduce more content; what do you enrich?				Acting Programme Director for the Spatial Communication
2015	autumn	practice-based experimenting with theoretical framework to draw out insights; design: look at materials, storyline, form, scale, colour, texture; prototypes to be tested - what am I validating?; how is the narrative theory in the process affecting the interaction?; designers as priority audience for PhD; time-based aspects of the interaction process; toolkit as end?				research sabbatical
2016	spring	K1 should be more explicit? should it help people understand the film's message? could cardigan be surface treatment? evoke rather than literal; duality, closer to structure of the narrative; can user choose the interpretation?; thermochromic ink - timing of the experience				Course Leader and Senior Lecturer on BA (Hons) Spatial Design; Senior Lecturer on Contextual and Theoretical Studies
2016	summer	PhD summer school theatre in design; 2xkettle prototypes (K1+K2); are we looking for "qualities" of the film in the interaction?; what is the process trying to do? helping to design objects with narrative intent for experiences with more narrativity; potential: commercial-memorability, making everyday special, evoking personal interpretation, adding qualities, adding meaning to object; designing potential for narrative to be created; trigger imagination and personal interpretation; reinforcing sense of identity; Testing: 4xkettles, one from each film; film provides content of the design; unfolding and story worlds; testing mechanism; What are we looking for in testing?			August 2016 Theatre in Design International Seminar and PhD Summer School Week-long seminar and PhD training course run by the University of Southern Denmark, Kolding, Denmark.	
2016	autumn					
2017	spring	K3 designed; K1 and K2 tested; K4? caring to dangerous? test K3+K4 in the same way?; interview about the kettle at home - is this comparable, or should it be tested in the same way?; papers being written with Middlesex team; how to analyse conversation transcripts?; markers of narrativity: emotion, agency, engagement, memories, reflection, etc; new toolkit; insights into discussion: what films brought to the design; time-based experience vs touchpoint; prototypical story structures vs non-conventional narratives; no value judgement; don't go back to frameworks to evaluate: tautological; tellability; right word?; why would people resonate with this approach? sustainability and conceptual design to the everyday; thesis writing; new title		Jordan, P. W., Bardill, A., Herd, K., Grimaldi, S. (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', The Design Journal, 20(sup1), pp. S4292–S4306. ; Ali, H., Grimaldi, S. and Biagioli, M. (2017) 'Service Design pedagogy and effective student engagement: Generative Tools and Methods', The Design Journal, 20(sup1), pp. S1304–S1322.		Course Leader MA Service Experience Design and Innovation.; Research Coordinator for the School of Design.
2017	summer		Writing up			
2017	autumn	analysis of testing - qualitative analysis of transcripts; more associations, story worlds, agency, emotion, reflection; intangible elements of film and tangible elements of the story; thesis structure		Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) The Routledge Handbook of Sustainable Product Design. Routledge/Taylor & Francis.	Chaired The Craft of Service Design event as part of the Service Design Fringe, London Design Festival 2017.	
2018	spring		hand-in	Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process , in Design Research Society Conference Proceedings. DRS2018, Limerick, Ireland.		
2018	summer					
2018	autumn					

Chapter 1. Practice Review: How Narrative Is Used in Product Design.

This practice review examines examples of narrative design to show the breadth of ways in which narrative is used in design. This includes not only those designs that use narrative within the design process but also those that deliver a narrative from the user's perspective, predominantly looking at examples in which this was intended by the designer, for example, those designs that may use narratives to structure user experiences over time, though they may not deliver an explicit "story". Despite the scholarly interest and its considerable use in design practice, there is little systematic study of the different uses of narrative in design.

This research applies concepts from narrative theory and from examples of narrative media as guiding principles within the design process. It is not uncommon for design research to appropriate concepts and methods from other disciplines such as psychology, sociology, and the humanities; the resulting design research and practice focusses on concepts such as emotion and critical value or uses appropriated methods such as ethnography. Of particular interest to this study, designers and design researchers are increasingly talking about narratives, stories and storytelling as driving forces for design, and these concepts are becoming more relevant to the discourse within product design. In the field of product design, narrative and stories are being used as a way to better understand users and to create more engaging product experiences.

Narratives are talked about and used in many different ways in relation to products. Typically, narrative is used as a driver for the design process and to communicate a design intention to a user. Narratives are also commonly associated to products through personal anecdotes involving the use of the product or through advertising. Steffen discusses how and to what extent 'products can tell a story' (Steffen, 2009), Lloyd explores the importance of storytelling in the engineering design process (Lloyd, 2000) and Forlizzi and Ford argue how narratives and storytelling are valuable concepts in designing better user experiences (Forlizzi and Ford, 2000). There are also other less common ways in which narrative is used within the design process or within design research, for example as a way to structure user experiences over time and facilitate user interpretation of a product; Löwgren for example talks about the dramaturgy of user experience as it unfolds (Löwgren,

2009) and compares the unfolding of a user experience to a typical dramaturgical structure.

The majority of the design literature uses the term 'story' or 'storytelling' as opposed to 'narrative' (see for example Forlizzi and Ford, 2000; Parrish, 2006). However, story or storytelling are problematic terms within the narratology literature because they lack specificity and can be misinterpreted. Most narratology literature, for example (Abbott, 2008) and (Bordwell, 1985) uses the term 'story' (also 'fabula' or 'histoire') to describe the events that constitute the narrative, and their chronology. This is in opposition to the way these events are told, referred to as narrative discourse (also 'syuzhet' or 'discours'). The term 'narrative' is universally accepted to mean the combination of 'story' and 'narrative discourse', the combination between the plot events and the way these events are told; as such, narrative is a more general term and one that makes it possible to not only look at the events within a particular story, but also the way that story is presented in narrative form. Because this research is appropriating elements from narrative theory, the term narrative is used throughout this research, as it is important that the term 'story' as used in narrative theory is not confused with the more general understanding of the word 'story' to mean 'narrative' or the combination of 'story' and 'discourse'.

There are many reasons for the recent interest of design researchers in narratives. Narratives play a central role in the way we experience the world: they are 'vehicles' that we use to condense and remember experiences (Forlizzi and Ford, 2000), they "'make present' life experience and interpretations of life in a particular time and space" (Schiff, 2012, p.33), narratives "organise not just memory, but the whole of human experience" (Young and Saver, 2001, p. 75), and they are crucial for our understanding of time and time-based events (Abbott, 2008). It can be argued that many product experiences that are memorable or engaging are mentally structured in narrative form by the user.

Narratives are one of the most natural ways for people to exchange information, because they evoke more meaning and emotion than bare facts (Lloyd, 2000; Booker, 2004; Steffen, 2009). The philosopher Richard Kearney wrote: "Telling stories is as basic to human beings as eating" (Kearney, 2002, p. 3). The ability of narratives to communicate ideas and to stimulate imagination allows design to go beyond the object's purely functional purposes and opens new perspectives for designers to use design to imagine, discuss and propose scenarios for the future, as in design fiction (Sterling, 2009; Dunne, 2013; Markussen and Knutz, 2013; Blythe,

2014) or in critical design (Dunne, 2008; Malpass, 2013, 2017). Moreover, for certain products, the accompanying narrative is often an essential dimension to create subjective and rich experiences with products. For example, the Tree Trunk-Bench from Droog design is not just a sitting object, but also a manifesto and a story about customisation and locally available resources: only the chair backs are for sale and customers are expected to source a local tree trunk to install the backs into. Before the object is even delivered to the user's house the user will have had to invest a lot of time and effort into sourcing a tree trunk, thus beginning the personal story of the user's engagement with the object before the object is even in the user's possession (Ocnarescu *et al.*, 2012).

Narratives as manifested in novels, drama and movies are exceptionally effective in creating engaging and memorable experiences and they are used as a tool to understand our own identity and selves (Crossley, 2002). This point has raised interest in incorporating narratives directly into the user experience of products (Grimaldi, 2013) and to use narrative structures to enrich user experiences: "[designers could] create rich experiences in a way that is similar to writing stories: they can carefully plan different emotional narrative elements through time to compose a holistic and meaningful experience" (S. Fokkinga and Desmet, 2012).

The creation of narratives is ubiquitous in the design process of user-centred design. For instance, tools like scenarios, user diaries, personas, and cultural probes use storytelling within design teams to communicate user insights, imagine future contexts, to create brand narratives and to stimulate creativity (W. Gaver, Dunne and Pacenti, 1999; Dindler and Iversen, 2007; McCarthy and Wright, 2010). The ubiquity of these tools, however, creates a communication problem: whenever designers speak about using narratives in design it is usually assumed that these narratives are used in one of the above ways, and it is sometimes harder to explain different approaches to the use of narrative because of these more common methods and perspectives.

This chapter was started as a paper co-written with Steven Fokkinga at TU Delft and Ioana Ocnarescu at Bell Labs Paris, reviewing the use of narrative within product design. This paper was peer reviewed and presented at the 2013 Designing Pleasurable Products and Interfaces conference (Grimaldi, Fokkinga and Ocnarescu, 2013), published in the proceedings and is attached in Appendix 2. The database of design examples derived from a workshop the group organised at TU Delft, in which we brought to the table all the examples from our individual

research in which design was identified as being narrative, and attempted to identify the role of narrative in these. In order to establish a basis for analysing the use of narrative within product design, each researcher in this study brought a number of examples of product design that were narrative, as documented either through the designer's own papers or presentations, or through an a-posteriori analysis carried out by another researcher in writing or presentations. The role of narrative within the design is identified in the source paper and interpreted by the designer or the author of the work itself, so the research team did not have to be concerned with deciding whether a product was narrative, but only with collecting those instances where the designer or another researcher had already identified the product as being narrative.

We clustered the design examples in different ways, in an effort to describe what narrative use in design looks like, and to validate if there were any gaps in knowledge in the literature. After testing several configurations and organising principles, the most productive way to present this field and to cluster these examples was by answering the questions *who*, *where*, *when*, and *why* in relation to the narrative.

Out of this analysis we built two frameworks. The first framework, *Narrative Functions (Why Narrative is Used in Design)* details the functions of narrative in design and their relevant attributes and principles, dividing the reasons for using narrative, or the effects of narrative, according to how they manifest in the design process and in user-product interaction. Focussing on the effects of narrative on the design informs the inquiry, detailing possible motivations to use narrative in design. This is also valuable when applying the findings of this research in different contexts, with different users and aims.

The second framework, *Typology of Narrative Use in Design (Ways in Which Narrative is Used in Design)* combines the answer to *who*, *where* and *when*, showing six ways in which narratives have been used in design. This was classified according to *who* creates the narrative and *who* the audience of the narrative is, *when* in the design process or user experience the narrative is experienced, and also *where* the narrative is located, whether it can be experienced as part of the product itself (internal) or whether it comes with an accompanying narrative (external).

Two strands run through these two frameworks in parallel: one concerns narratives that are used during the design process and one that concerns narratives that emerge from the user experience and interaction with an object, addressing the

question of *when* the narrative is experienced (whether the narrative is experienced in the design process or the user experience*).* This is a deliberate choice in order to better outline the scope of this study, and to identify any gaps in the knowledge. This classification will then be used as part of the practice methodology, with each individual type informing the design methods and the design process.

1.1 Narrative Functions: Why Narrative is Used in Product Design

This section outlines those functions of narrative that have been identified in design research and applied through design practice. The focus is on what the effects of using narrative are, so that the principles can be teased out and applied to specific practice contexts. The examples are sourced from projects in which the narrative qualities were made explicit through either the designer's own writing or presentations or through a documented interpretation in the design literature. This implies that a lot of examples that are obviously narrative but have not been explicitly described as such were excluded from the table below.

Motivations for using narrative and its effects within product design are often multi-layered and complex. However, some examples show a particular effect more clearly than others and have therefore been used to illustrate that particular effect. Though this limits which examples appear in which category, it allows this research to focus on individual functions to clearly analyse and outline narrative use within products. Most functions are detailed in Table 1, but a few examples of products are analysed.

	In design process Where and When	In product use Where and When
NF1 Communicating and Conveying Information	Designers and researchers use narratives to communicate insights more clearly and effectively, for instance in persona stories, context stories, or stories about current product use. Examples: *Cyrrus Technologies* (Lloyd, 2000); *Fictional Inquiry* (Dindler and Iversen, 2007)	Narratives can be used to communicate to users about how they can use their products, for instance in usage scenarios. Example: *Do Design* (Taylor, 2013)
NF2 Evoking Reflectivity	User or product narratives that involve an unusual situation or some kind of conflict can be used by designers to highlight design problems or cultural issues. Examples: *Design Fiction* (Ypma and Wiedmer, 2010)	In critical design, narratives are used to prompt users to reflect on the role of products and technology in their lives. Examples: Gamper, *100 Chairs in 100 Days* (in *Malpass, 2013*); *Design Noir (example: Nipple Chair)* (Dunne and Raby, 2001); *Philosophical Toys* (Hayward, 2013)
NF3 Showing and teaching values	Narratives can be used in the design process to show certain do's and don'ts of user-product interaction, for instance in horror stories of past products. Example: *Cyrrus Technologies* (Lloyd, 2000)	Narratives, such as those used by movements like cradle-to-cradle or modernism, can be used to convey the ideological purposes of the products they set forth. Also in critical and speculative design the main purpose can be to show society's values. Example: Auger's Smell +: Dating and Genetic Compatibility Smell Blind Date *(in Malpass, 2013).*
NF4 Empathy, Identification and Bypassing Social Structures	User or persona narratives are often used to achieve a greater empathy with real users than could be obtained with target group data. Examples: Blythe & McCarthy's Technology Biography, Gaver's Cultural Probes and Blythe's Pastiche Scenarios (all in McCarthy and Wright, 2010); Narrative Inquiry (Danko, 2006); Fictional Inquiry (Dindler and Iversen, 2007).	Personal narratives that a user attaches to an object, for instance its history, or who they received it from, can greatly increase the perceived value of the object. Example: The Comfort of Things (Miller, 2008).
NF5 Imagination and Creativity	Narratives can be used by designers to spark imagination and increase creativity. Examples: Cultural Probes (Gaver, Beaver and Benford, 2003)3); Design as Storytelling (Parrish, 2006).	Product narratives can inspire users to new ways of using the products, or even new ways of fitting the products in their lives. Example: Significant Objects, (Glenn and Walker, 2012).
NF6 Memorability	User insights that take the form of a narrative are easier to remember than facts or bullet points. Example: Invisible Design (Briggs et al., 2012).	Narratives attached to or created through a product increase the memorability of product experience, and increase word of mouth. Examples: *Ta-Da Series* (Grimaldi, 2008); Brand narratives (Steffen, 2009); Narratives in user experience (Forlizzi and Ford, 2000).
NF7 Engaging and Delighting	Narratives that don't just inform but also delight, increase the chance to be used frequently and effectively by the design team. Examples: Invisible Design (Briggs et al., 2012); Fictional Inquiry (Dindler and Iversen, 2007).	Narratives, either as part of a product or external to it, can enrich the user experience. Examples: Ta-Da Series, in particular the On-Edge Lamp (Grimaldi, 2008); Anna G corkscrew by Alessi (Markussen, Ozcan and Cila, 2012)2).
NF8 Persuading	Narratives about particular groups of users can help persuade design teams or funding bodies about the necessity of a particular design approach. Example: Inclusive Design (Moore, 2011).	Narratives created through branding and advertisements persuade users that one product is superior to another
NF9 Cohesion and Comprehension	Narratives can be used to test how different elements within a complex design or system work together. Example: *Design as Storytelling* (Parrish, 2006)	Narratives can help make complex user experiences more coherent and help the user see the connections between different parts of the experience. Example: *Freya's Cabin* by Studio Weave (Ahn and Smith, 2011).

Table 1 Narrative Functions. Long form found in Appendix 3

Figure 3 Nipple Chair by Tony Dunne and Fiona Raby. Source: www.dunneandraby.co.uk

Dunne and Raby's Nipple Chair in Figure 3 is an example of an object designed with the narrative experience of the user in mind. The chair is designed with two "nipples" on the backrest, which, from the user's point of view, start vibrating in seemingly random patterns. Dunne and Raby gave the object to people to test in their own home over a period of a few weeks. The user who was given the object to test responded by assigning a personality to the chair and saying that the chair got excited when he came home from work. By designing an object that is responsive and has a clearly defined behaviour, but that is ambiguous in terms of the trigger of this behaviour, Dunne and Raby fostered several different reactions in the user. Dunne and Raby's aim in designing this object was to make the user reflect about the omnipresence of electromagnetic signals within the home, and this was also evident from testing this object. Therefore, the object was classified under "evoking reflectivity". However, the user also empathised with the object by assigning it a personality to justify the reason for the pattern of vibration; the object stimulated the user's imagination, because the user needed to create a narrative around the

object in order to make sense of its behaviour; and the object delighted the user. Some effects can be completely excluded, for example the narrative did not convey information, persuade the user, or make the design more coherent.

Figure 4 Anna G corkscrew by Alessi. Source www.store.alessi.com

Figure 5 On-Edge Lamp by Silvia Grimaldi. Author's own

Similarly, the narratives implicit in Alessi's Anna G

Figure 4, or in Grimaldi's On-Edge Lamp Figure 5 are meant to delight and to increase memorability, but do not aim to teach values or elicit empathy. Alessi's Anna G is described in the paper Beyond Metaphor in Product Use and Interaction (Markussen, Ozcan and Cila, 2012) as eliciting three different reactions and interpretations in the three authors of the paper; one author read the object as referencing a woman's figure, and fun to look at; the second author concentrates on how the arms lift when the corkscrew is screwed in, making the figure appear happier and happier; the third author was struck by the awkward task of removing the cork from Anna G's skirt after having opened a bottle, and how the name reminded him of one of Freud's patients. Though the interpretations are different they all include an element of delight and an element of agency and narrative, assigning a personality and emotions to the object.

The On-Edge Lamp was described by the designer in two papers (Grimaldi, 2006, 2008) as being designed to elicit the emotion of surprise, but as a consequence this

creates a narrative for the user which is delighting and memorable. Narrative elements in the design process often aim to evoke creativity in the designer or in the team, such as with Gaver's ambiguity technique (Gaver, Beaver and Benford, 2003).

Figure 6 Freya's Cabin, by Studio Weave. Source: www.studioweave.com

These goals might also be combined in a closer and more aligned way. Studio Weave is an architecture studio who use narrative as a starting point for designs, as well as using narrative as a tool to explain the project to stakeholders, construction teams and users alike. In the example above, Freya's cabin in Figure 6 is one of two cabins which overlook a lake. At the beginning of the ideation process, the designers created a story of two lovers who were very different, Freya and Robin, and who lived on opposite sides of the lake, and though they were in love they could not live together because of their differences. This story was then used to guide their design process and to communicate about the project. The story is also very evident in the design features of the two cabins, which align closely with the characters' personalities. In this example, the narrative is used to foster creativity, but also as a way of conveying information about the project, because it helps to explain the design to the public and to the construction team, and also delights and creates a memorable experience for the visitor and user. In addition the designers argue that it is used for persuading stakeholders and building crews of the importance of

particular design details, it fosters comprehension in the visitor, who might better understand the rationale for the design, and allows the visitors to empathise with the characters that drove the design (Ahn and Smith, 2011).

It is important to note that the above functions or effects can also be attributed to designs which are not necessarily narrative. For example, a product could be appealing or memorable because of any number of features of the design. However, these qualities are not part of the above classification, as this focuses on the effects that the narrative related to the product has on the design process or user experience.

The Narrative Functions framework helps to outline a series of possibilities of using narrative as a guiding principle for design, and these possibilities are valuable in the design phase of the research as they inform the methods used in the design process. The Strategies for Design Practice (Section 3.3.4, p. 106) outlines the idea generation methods, in which the Narrative Functions are used as one of the prompts that helps to create variations on design concepts. By outlining in detail some of the possibilities of what narrative can do for design, it is possible to be more focussed through idea generation techniques, exploring diverse ways of using narrative in the design process. Quickly creating a rich range of concepts and variations at the idea-generation stage allows the designer to then select what narrative functions and effects are most appropriate for the particular experience that is being designed. The Narrative Functions are also incorporated as part of the Narratives in Design Toolkit (Section 4.2, p. 146, and Section 4.4, p. 191), aimed at designers across different disciplines.

1.2 Typology of Narrative Use in Design: Ways in Which Narrative is Used in Design

This section presents an overview of narrative use in product design, placing examples of product design practice into six broad categories. These categories focus on who is the creator of the narrative and who is the audience of the narrative, and whether this narrative occurs in the design process or in product use. Some narratives are suggested by design, others are completely delivered through design, and yet others support the design process.

This typology of use started from a bottom-up classification of a number of design examples that have significant narrative elements, as well as written accounts of narrative use in the design process and examples of designers explicitly using narrative principles in their designs. The examples were then grouped according to *who* is the audience of the narrative (the designer or the user) and *who* is the creator of the narrative (the designer or the user), the timing of the narrative (*when* in the user experience or the design process the narrative emerges) and the agency of the object (*where* the narrative is located: whether it is internal to the object, so the object helps to recall a narrative, or creates a narrative-like or easily narrativised experience; or whether this is external to the object, so the object is accompanied by a narrative). Although the design examples often fit clearly into one category or the other, there is overlap, as the categories are not mutually exclusive.

		Cluster 1: Design facilitates a narrative (who: user → user)
Who When Where	User → User User Experience Internal to Object	T1.1: Design activates remembered or associated stories in the user Examples: objects that are associated to memories of loved ones; Anna G corkscrew by Alessi (Markussen, Ozcan and Cila, 2012).
Who When Where	User → User User Experience External to Object	T1.2: Design facilitates in-the-moment story imagining in the user Examples: child play with objects ; Nipple Chair by Dunne and Raby (Dunne and Raby, 2001)
		Cluster 2: The narrative supports the design process (who: either→ designer)
Who When Where	User → Designer Design Process External to Object	T2.1: Narratives as a research tool Examples: narrative user insights; Cultural Probes (Gaver, Beaver and Benford, 2003)3); design ethnography
Who When Where	Designer → Designer Design Process External to Object	T2.2: Narratives as a creative tool Examples: Freya and Robin; Studio Weave (Ahn and Smith, 2011); Fictional Inquiry Dindler and Iversen, 2007); Design by Tangible Stories (Nam and Kim, 2011); Interaction Relabelling (Djajadiningrat, Gaver and Fres, 2000)
		Cluster 3: Design delivers a narrative (who: designer → user)
Who When Where	Designer → User User Experience External to Object	T3.1: Design is accompanied by a narrative external to the object Examples: branding and advertising; design movements; Tree Trunk Bench by Jurgen Bey for Droog ('Droog – the design tells the story | D*Hub', no date); Significant Objects (Glenn and Walker, 2012).
Who When Where	Designer → User User Experience Internal to Object	T3.2: Design structures the user experience over time as a narrative Examples: Interaction with an ATM machine and SoMo3 – The Musical Mobile, IDEO with Crispin Jones (Löwgren, 2009).; Anna G Corkscrew by Alessi Markussen et al., 2012); On-Edge Lamp by Silvia Grimaldi (Grimaldi, 2008) .

Table 2 Typology of Narrative Use in Design

1.2.1 Cluster 1: Design facilitates a narrative (user -> user)

Here the user is both the creator and audience of the narrative. The narrative can be created by the user through memories or associated stories, or it can be created by the user while using an object, for example using the object as a prop in imaginative play.

1.1: Design activates remembered or associated stories

These objects do not come with a narrative that was specifically intended by the designer, but trigger a personal memory or narrative association of a significant

event, place, time or person. For example, people may keep certain inherited possessions of their grandmother, like knick-knacks or cookware, on the mantelpiece because they trigger stories and memories of childhood visits to grandma. The object is not specifically designed to contain and activate these memories, but it can often come to form part of a person's identity. Daniel Miller has written about material culture from an anthropological point of view, and how objects, in particular domestic objects, can come to take on personal meaning and stand in for certain aspects of a person's identity (Miller, 2008).

This category also includes objects that are specifically designed to activate stories of cultural meaning in the user, which are part of the cultural knowledge of the intended audience. For example, Alessi's Anna G corkscrew [

Figure 4] can activate associations in the user by using the image of a saintly woman, while also activating different associations through the title reference to Sigmund Freud's famous patient Anna O. A user that is aware of both these cultural associations can create the story of the virtuous woman that seems paradoxically happy with a cork sliding up her skirt (Markussen, Ozcan and Cila, 2012).

1.2: Design facilitates in-the-moment story imagining in the user

This category comprises the most open-ended use of narratives in design. The designer inspires the narrative but leaves space for personal interpretations through ambiguity. A classic example is a child playing with a stick. The child can use the stick to imagine herself in a story, in which the stick can be a horse, a sword, a fishing rod, or a witch's broom, according to the story she wishes to envision. The stick lends itself to this play because it is reminiscent of these other objects in shape, but ambiguous enough to leave space for the imagination. But the category is not restricted to child's play. For example, Tony Dunne and Fiona Raby's Nipple Chair [Figure 3] is designed to trigger story creation in the user through intriguing but ambiguous output. The chair features two 'nipples' that seem to vibrate at random times. Because the user is unaware of exactly what electromagnetic event turns the vibration on and off, he or she is likely to attribute some sort of causal narrative to the chair's erratic behaviour (Dunne, 2008).

1.2.2 Cluster 2: The narrative supports the design process

Here the designer is the audience of the narrative, which may be created by the designer or the user. This can include any narratives that inform the design process and that the design team takes into consideration during the process of designing.

2.1: Narratives as a research tool (user -> designer)

Examples in this category have become ubiquitous in user-centred design, helped by methods from ethnographic research, and there are countless examples that are common practice, from design ethnography to focus groups. User insights need to be captured, communicated and remembered within a design team, and narratives are one of the most natural structures for these purposes. An example of a designerly method in this category is cultural probes (Gaver, Dunne and Pacenti, 1999), which have gained popularity among designers in the past two decades and are widely used in different forms. Rather than recording data by having users answer specific questions, cultural probes stimulate users to tell stories about themselves and their lives (Steffen, 2009). For example, the *Dream Recorder* [Figure 7] makes people talk and share intimate information and authentic thoughts that inspire designers.

Figure 7 Gaver's "Dream Recorder", from "Cultural Probes". Source: (Gaver, Dunne and Pacenti, 1999).

2.2: Narratives as an analysis or idea generation tool (designer -> designer)

Design teams create narratives for use within their teams during the design process, usually as a way to analyse or synthesise user insights, typically through personas and experience maps, or as a way to generate focused design ideas. A clear example is the way Studio Weave works on architectural commissions. Their project *Freya and Robin* [Figure 6], for example, starts as a story about two characters that lived on opposite sides of the lake for which the studio designed observation cabins. The story then becomes the guiding principle for the design of the cabins, and is used to motivate most of the design choices about the materials, forms and functions of the cabins.

There are numerous examples of narrative elements being used during the design process as a creativity tool, such as Dindler and Iverson's Fictional Inquiry (Dindler and Iversen, 2007) and Nam and Kim's Design by Tangible Stories (Nam and Kim, 2011), in which the authors argue that literary fiction can be used as a resource for design. Djajadiningrat and Gaver's *Interaction Relabelling* (Djajadiningrat, Gaver and Fres, 2000) shows how in a design assignment unrelated products (e.g., a toy revolver) can open up new space for creativity by bringing a different story to the table.

1.2.3 Cluster 3: Design delivers a narrative (designer -> user)

The designer creates the narrative, while the user is the audience of that narrative. The narrative is usually delivered through or with the object.

3.1: Design is accompanied by a narrative external to the object

The narratives in this category are apparent in everyday branding of products and services. For instance, when a user buys a pair of Nike shoes, she is in fact also buying the narrative around it, pointing to ideals of fitness and active lifestyle, which is communicated through advertising and word of mouth. Such narratives also exist for ideological reasons. For example, a user might be stimulated to buy organic milk because it includes a narrative of happy cows, health, and

environmental benefits. Similarly, modernist design often featured a narrative, either explicitly or implicitly, about what was to be considered 'good design', and how users could live better lives. Products from Droog design use external narratives more explicitly – every Droog product is accompanied by a story ('Droog – the design tells the story | D*Hub', no date). The project Significant Objects (Glenn and Walker, 2012) aimed to measure the added value that an accompanying story adds to an object. Cheap objects were purchased at flea markets and writers were asked to write an accompanying story. The objects were then sold on eBay with the attached story to verify the increase in value. For example, a glass that was bought for $0.50 was subsequently sold for $50 [Figure 8]. The buyers were not purchasing the story, freely available online, but simply the object which acquired meaning through the story.

Figure 8 Glass that increased in price 200-fold with an accompanying story. From Significant Objects. Source: www.significantobjects.com.

3.2: Design structures the user experience over time as a narrative

This category features product and service experiences that have been explicitly structured to unfold as a narrative to the user. This is a design approach in which the designer envisions the interaction between the user and product over time, and carefully plans the sequence of events so the user experiences the intended narrative. This design approach is for instance common for immersive theme parks,

entertainment venues, and luxury hotels. Existing everyday objects can be described to (unintentionally) fit this category as well. For example, Löwgren describes, within the context of aesthetics of interaction, how an experience with a cash machine (ATM) is articulated as a story in the user's mind through the build-up and release of tension. He describes how dramatic tension is built while the machine processes the PIN number, how other people in line behind the user can evoke fear of being robbed or anticipated shame for not having enough funds, and how the money and card finally being released from the machine brings relief. (Löwgren, 2009). In a similar way, the Anna G corkscrew [

Figure 4] also fits this category, because the corkscrew is designed to first show the user the saintly figure that evokes certain associations, but later in the experience the cork disappears underneath the woman's skirt from where the user needs to retrieve it. This contradiction evokes a time-based user experience that is structured as a narrative (Forlizzi and Ford, 2000).

Products that evoke specific emotions over time also fall in this category. For example, the user of the On-edge Lamp (from Grimaldi's Ta-Da series) [Figure 5] is meant to discover certain surprising findings in a particular sequence to increase the memorability of the object: the designer intended the lamp, which references the form and material of glass lamps, to sit on the edge of the table, so as to appear in a position of danger and activate a gut reaction in the viewer to want to move it onto the table. This has two effects – when the lamp is fully on the table it shuts itself off, revealing that it is meant to be on the edge, and also by touching the lamp the user realises that it is made of rubber, not glass, and is hence not as delicate as it appeared (Grimaldi, 2008).

The Typology of Narrative Use in Design framework outlines ways in which narrative can be used at different stages, in the design process or in the product experience. By outlining different uses and different strategies to incorporate narrative, designers are aware of the narrative tools at their disposal in the design process. The The Strategies for Design Practice (Section 3.3.4, p. 106) describes how this framework is incorporated into the design methods in this research as well as codified into the Narratives in Design Toolkit.

1.3 Conclusions and Insights: Beyond familiar applications, uncommon uses of narrative

The practice review analysed a number of examples of products and design processes which have been interpreted in the literature or described by their designers to be in some way narrative and created a classification of these objects and methods. While this is not a comprehensive review, being based on those examples that Grimaldi, Fokkinga and Ocnarescu (Grimaldi, Fokkinga and Ocnarescu, 2013) have found while researching their respective PhDs, it does allow enough scope to create a classification of these products. The classification is expressed through Narrative Functions, based on why narrative is used in design or design process, and Typology of Narrative Use, based on who creates and experiences the narrative (user and/or designer), when narrative is used (in the design process or in the product experience), and where the narrative manifests itself (internally to the product, or externally through an accompanying narrative).

This classification offers several insights to this research:

- **Defining and categorising ways in which narrative is used within product design makes it possible to identify with precision the type of narrative use that will be within the scope and outside the scope of this study**. When I started this research, I found it very difficult to explain to other designers the way in which I was using narrative without them immediately assuming I was working with storytelling in product advertising, or ethnographic design research methods, or associative and critical design. It seemed clear from the beginning that having heard of narratives and stories being used in particular ways within design, or having used stories in particular ways, most of the people I was talking to would jump to the conclusion that what I was doing fell within one of these more typical uses of narrative. By clearly categorising different ways in which narrative is used it is easier to make a case for a particular use which falls outside of the typical examples of narrative design, while at the same time also identifying areas in which narrative has already made a valuable contribution.

- **This classification allows us to define a gap in knowledge in the particular area of narrative product design that this study is**

concerned with. Specifically, this gap is identified as design structuring the user's product experience over time as a narrative. The most common ways in which narrative has been used within product design practice fall within Cluster 2 of the above Typology, in which narrative supports the design process through research or creativity tools, or within category 3.1, in which the product is accompanied by a narrative that is associated or external to the object. Cluster 1, in which the user is the creator and audience of the narrative, is very prominent in associative and critical design (Malpass, 2013, 2017). Category 3.2, in which the designer structures the user experience over time as a narrative, is the one that has the least examples. This gap in knowledge and practice was recognised as one of the prompts for this study, and through the classification above it was validated as an appropriate area of investigation, which will contribute new knowledge to the field of product design research and practice. In particular, this research is concerned with the implicit narrative that exists in product use, throughout the time of the user's experience with the product [Figure 9], and how designers may be able to direct this narrative to achieve particular effects in the user experience. This will be explained in more detail in Chapter 2 (p. 51).

- **The classification informs the generative design methods for the practice-based aspects of the research, mapping directly onto a number of the categories used in the generative design process.** The classification is used as a starting point for generating and manipulating design concepts, and is incorporated into the Narratives in Design Toolkit. This will be described in more detail in the Methodology (Chapter 3, p. 84).
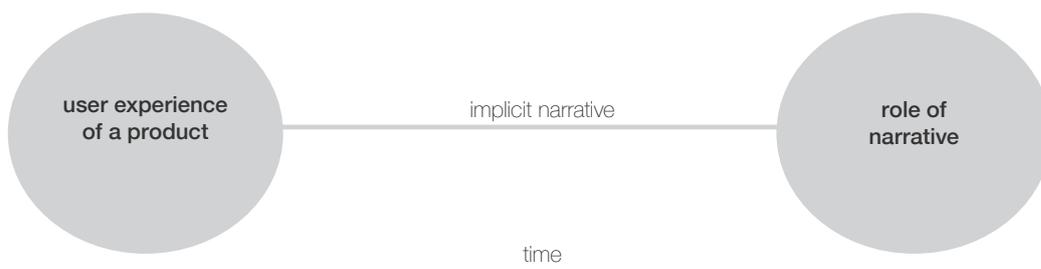
Figure 9 Implicit Narrative in Product Experience. Author's own.

Chapter 2. Literature Review and Framing of the Concept: Product Experience and Narrative Products

The premise of this research is that using any product gives rise to a user experience and it is narrative in nature. Implicit in this statement is the study of several different fields of knowledge, at the intersection of product design and narrative theory, in order to study the ways in which people interpret interactions with products. In particular, this study focuses on domestic products, because of their familiar and mundane nature, and on film as a narrative medium, because it is accessible and time-constrained. Methods are created to apply narrative elements from film examples to generate designed products which "direct" *tellable* product experiences.

To substantiate the claim that user experience is narrative in nature, two lines of thought are looked at in parallel. On one hand there has been research within psychology and in experience design around the idea that experiences are described and remembered as a story (Bruner, 1991; Forlizzi, 1997; Dewey, 2005; Hassenzahl, 2010). On the other hand the field of narrative theory has been lending itself to wider interpretations of what narrative is, that are less tied to a specific medium, the literary text, and are open to accepting other mediums but also real life experiences, or the on-the-spot and a posteriori recounting of experience, as having narrative qualities (Young and Saver, 2001; Bal, 2002; Abbott, 2008). [Figure 10].

experiences	on the spot or a posteriori recounting of an experience	narratives
are described and remembered in story form		wider interpretations of what constitutes a narrative
(Bruner, 1991; Dewey, 2005; Forlizzi, 1997; Hassenzhal, 2010)		(Abbott, 2008; Bal, 2002; Young and Saver, 2001)
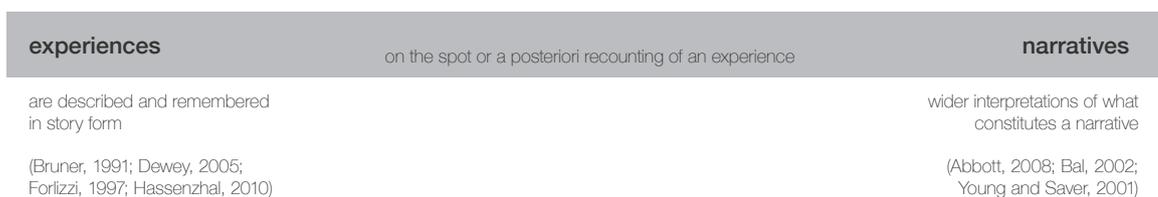
Figure 10 Convergence between experience and narrative theory. Author's own.
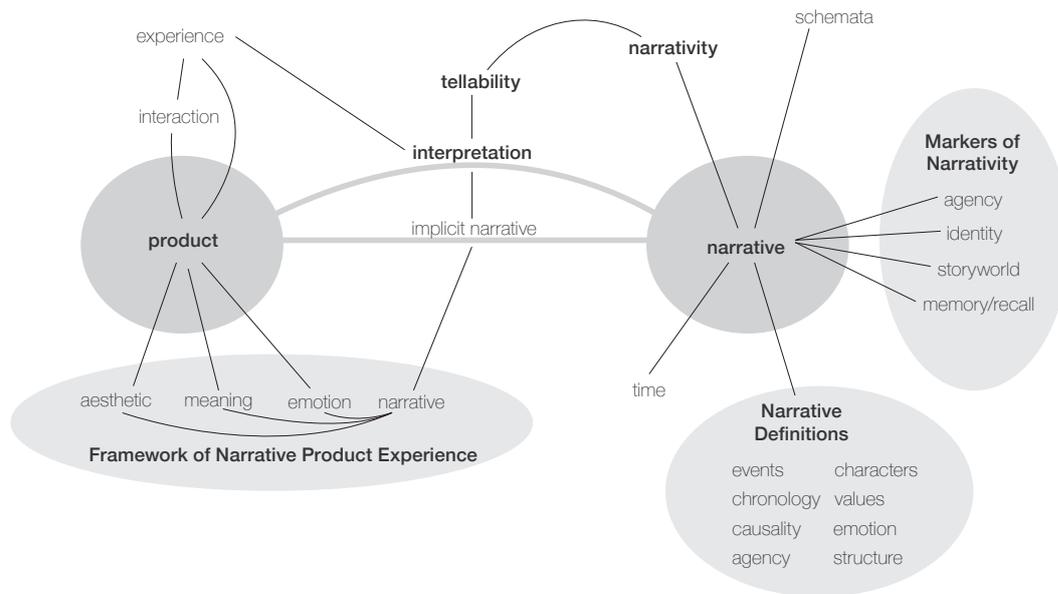
Figure 11 Map of the Literature Review. Author's own.

Looking at physical domestic products prompting narratives when they are interacted with suggests an exploration of different theoretical fields related to both products and narratives, to arrive at a framework that can guide further stages of the research. Figure 11 is a map of the key concepts in this study.

Domestic products are looked at through the idea of product experiences, because the focus is on looking at the way in which the interaction with a product is time-based and steeped in meaning. In addition, the approach is human-centred. To this purpose Hekkert and Desmet's Framework of Product Experience (Desmet and Hekkert, 2007) is adapted by adding a narrative element to account for the time-based nature of product experience. In addition, each element within the framework is defined through literature on product affordances from psychology and design (Gibson, 1986; Norman, 2002), product meaning and aesthetics from a sociological and anthropological approach (Csikszentmihalyi and Halton, 1981; Miller, 2008; Bourdieu, 2010), and product emotion, from a design and psychology approach (Damasio, 2000; Desmet, 2002; Norman, 2003; Miller, 2008). This takes into account the literature on experience psychology, which explores how experiences are assimilated and evaluated over time (Bruner, 1991; Hassenzahl,

2010; Karapanos, Martens and Hassenzahl, 2010) and ideas explored by interaction design about the way people interact with objects using stories, performances or trajectories (Benford *et al.*, 2009; Gaver, Beaver and Benford, 2003; Laurel, 2004; Löwgren, 2009).

Specific aspects of narrative theory are then explored: the relevance of narrative in the forming of identity (Sacks, 1998; Young and Saver, 2001) as well as the idea that our experience of the world is mediated through narrative understanding (Bruner, 1991; Young and Saver, 2001), our interpretation of reality through memory or recall is also guided by narrative principles (Bordwell, 1985; Young and Saver, 2001; Abbott, 2008) and our ability to empathise is greater when information is presented in narrative form (Danko, 2006; Wright and McCarthy, 2008). The approach to narrative is therefore framed though cognitive narratology, focussing on the way narrative is constructed in the audience/user.

The chapter also analyses definitions of "what narrative is" using minimum definitions of narrative from different narratological traditions, and breaking down their component elements. The elements are used to build a workable model for designers to understand and to make use of key concepts from the narratology literature within a design context, and are later incorporated into the Narraties in Design Toolkit (Section 4.2, p. 146, and Section 4.4, p. 191).

Interpretation is looked at as a cognitive activity of the user by focusing on the role of narrative in forming an interpretation of a product experience or interaction. This section reviews studies of narrative theory which can provide insights on narrative construction and interpretation (Bordwell, 1985; Bal, 2002; Abbott, 2008). Parallels will be drawn between different cognitive approaches to interpretation, in particular comparing Bal's idea that narrativity is central to interpretation of works of art (Bal, 2002) to Bordwell's description of schemata as a way that the viewer makes sense of film stories (Bordwell, 1985).

Finally, the conclusions of the literature review outline ways in which the theoretical framework built up through this literature review will be applied in the practice methodology.

2.1 The User Experience of Products: Domestic Products

This section looks at how users experience products when interacting with these. The terminology is deliberately selected: the words "object" and "people" feel more appropriate for this study than the words "products" and "users" because these terms are more universal and closer to common language. However, the decision was to adopt the words "product" and "user" because they are the terms commonly used within the cited design literature.

Several historical shifts in the role of the product or industrial designer are relevant to this project. Firstly, a shift in the 1980s from the designer as a stylist of an engineer's product, what Jones calls the age of design by drawing (Jones, 1970), to the 1980s conception, fuelled by increased consumption as well as movements such as Memphis in furniture, postmodernism in art and the emergence of star designers, that the designer should add cultural value to products. Another shift took place within the design profession; the dominance of ideas such as "Form follows Function" with origins in the 1920's Bauhaus, developed into a focus on ergonomics, usability, and simplicity as a design aesthetic; this led to the idea that products are more usable when people appreciate them aesthetically and emotionally. This second shift is evident in Donald Norman and Patrick Jordan's writings in the beginning of the century, which moved from a usability perspective which prioritised ease of use (Jordan, 1998; Norman, 2002) to an emotional view which prioritises pleasure of use (Jordan, 2000; Green and Jordan, 2002; Norman, 2003).

In the last twenty years, design researchers have increasingly become interested in the concept of product experience, looking at products as fostering interactive experiences with users, and focusing on how people experience products through interacting with these (Forlizzi, 1997; Forlizzi and Ford, 2000; Desmet and Hekkert, 2007; Schifferstein and Hekkert, 2007). This perspective looks at the active engagement of the user with the object in the creation of meaning and emotion out of the experience (Forlizzi, 1997; Forlizzi and Ford, 2000; Desmet and Hekkert, 2007; Hassenzahl, 2011; Fokkinga and Desmet, 2012). Most of this literature touches upon the role of narrative within a product experience, however this is never a central focus of these theories, showing the relevance of the current research for this particular field.

The experience of interacting with products has been investigated within the fields of psychology, product design, interaction design, experience design, human computer interaction (HCI), to name a few. This research focuses on the areas of design theory that investigate experience design related to everyday products: that of emotional design and that of human computer interaction. This focus highlights the ways in which product experience affects users, described in the emotional design literature, and the ways people interact with an object, which has been extensively studied in the HCI literature, though within this field the objects are usually digital. In this field, the literature tends to take a scientific approach to the key concepts, drawing mainly on psychology for the Emotional Design field and on behavioural science and computer science in the field of HCI.

This research contrasts the scientific approach with a humanities-based approach, introducing elements of anthropology and sociology to contribute to the theoretical understanding of particular elements within existing frameworks, and using qualitative humanities-based research methods such as design ethnography and qualitative analysis to investigate user-product interactions. This grounds the human-centred approach through a cultural perspective.

The next section builds on these areas, in particular the Framework of Product Experience (Desmet and Hekkert, 2007), creating a working model that includes the role of narrative within product experience, The Framework of Narrative Product Experience (Section 2.2, p.55). This model is then used to analyse the product interactions with the redesigned objects, and provides the foundation for actions within the design process. This will be detailed in the Methodology (Chapter 3, p. 84).

2.2 Framework of Narrative Product Experience

The *Framework of Product Experience* by Desmet and Hekkert is a valuable starting point in analysing the way users interact with products (Desmet and Hekkert, 2007). Desmet and Hekkert take an Emotional Design approach to product experience, focussing on "affective responses that can be experienced in human-product interaction" (Desmet and Hekkert, 2007, p.1). This particular framework was selected as a starting point because it acknowledges the user's experience of non-digital products and it breaks down the attributes of the product

into Aesthetic Experience, Experience of Meaning and Emotional Experience, allowing for a more in-depth inquiry into these separate areas.

Forlizzi and Ford's *Building Blocks of Experience* framework also provides a key theoretical position because it takes into account the role of narrative within the interpretation of experiences, outlining four different dimensions of experience: sub-consciousness, cognition, narrative, and storytelling (Forlizzi and Ford, 2000). These different dimensions are used by Forlizzi and Ford to describe different types of product experiences, from automatic interactions with objects to experiences that are assimilated into a personal story [Figure 12, Figure 13]. However, this framework does not break down in detail individual characteristics of a single interaction experience, rather it focuses on what types of experience might fall within a particular spectrum. It is thus of less value as a basis for this research, though it informs some of the concepts that are used.
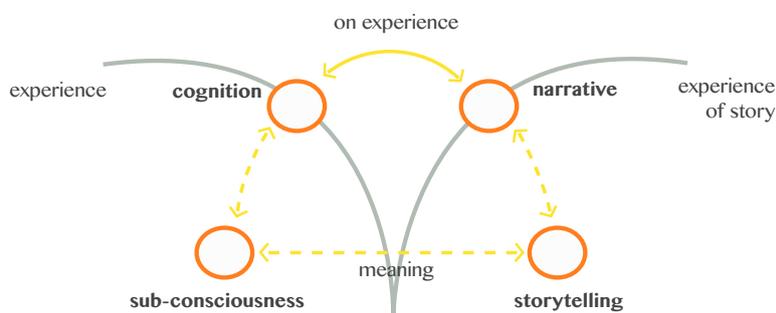

Figure 12 Building Blocks of Experience - types of experiences. Author's own redrawing of an image from Forlizzi and Ford (2000).
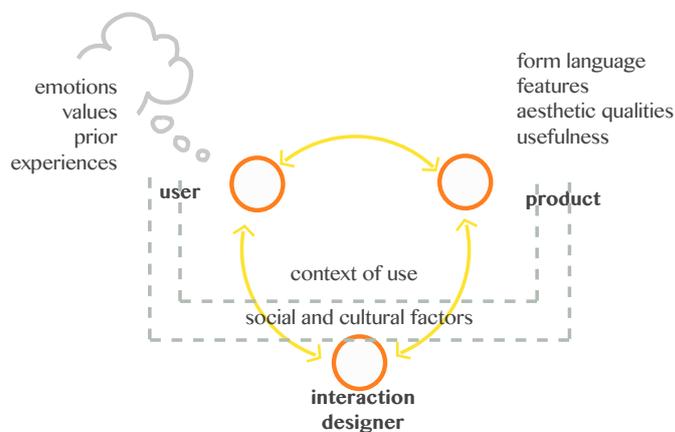

Figure 13 Building Blocks of Experience – the designer's role. Author's own redrawing of an image from Forlizzi and Ford (2000).

McCarthy and Wright's Threads of Experience model uses a pragmatist approach to experience, which the authors define as a commitment to the particularity and agency of action, felt life, emergence of a sense of self, interpreting, feeling and making value judgements on one's own experience. In the Threads of Experience Model, experience, intended as intense emotional experience, "felt, lived experience", is broken down into four Threads. The Sensual Thread encompasses sensory engagement with a situation, pre-reflective, tacit engagement, and absorbing experiences. The Emotional Thread encompasses emotions as qualities of particular experiences, feelings of the person towards the situation, influenced by value judgements ascribed to a situation, and user needs, desires, and goals. This is always relational, directed at someone or something, and it is a sense-making process, creating meaning. The Compositional Thread encompasses the relationship between the parts and the whole of the experience, structuring and framing the experience, with a clear beginning and end, and rationalised to create meaning. The Spatio-Temporal Thread encompasses the experience of space and time constructed through interaction, how we perceive space and time in an experience is interdependent on its emotional value, for example, and vice-versa (McCarthy and Wright, 2004). While the pragmatist approach is very relevant to this research, the Threads of Experience model is concerned with intense emotional experiences, as opposed to experiences with everyday objects.

Desmet and Hekkert break down the user experience of a product into three levels of experience as illustrated in Figure 14. Aesthetic Experience encompasses the experience the user has of a product through the senses and perceptual systems, including the visual, tactile and olfactory systems as well as the kinaesthetic system and how this creates an aesthetic experience in the way the action takes place, for example when a mechanism works in a smooth way and is a pleasure to use. These elements of product experiences operate on a visceral level, with little cognitive involvement. Experience of Meaning includes those processes that rely on the user's cognition, such as semantic interpretation, symbolic associations, assigning personalities to products, and attachment to and identification with products. In this element of experience the interpretation of the user plays a key role. Emotional Experiences describe those elements of interactions with products that cause emotional responses in the user, and are a personal response to a particular type of stimulus provided by the product. These elements rely on the user's emotional

system and cause the user to experience joy, fear or sadness in relation to a particular product.
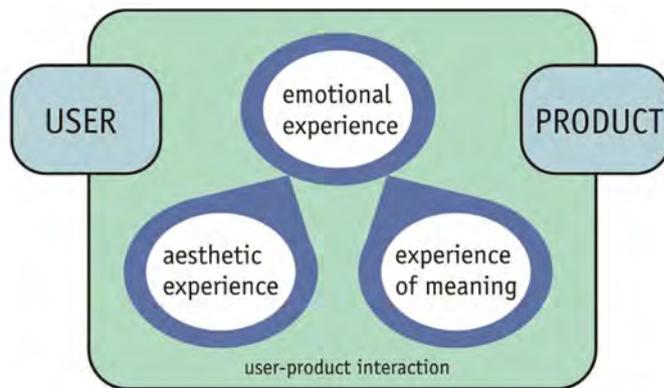
Figure 14 Framework of Product Experience. Source: (Desmet and Hekkert, 2007).

This framework requires some adapting and expanding to work as a basis for the current study. The main limitation of this framework is the hierarchical view of the different levels of experience, with Emotional Experience as the pinnacle with Aesthetic Experience and Experience of Meaning feeding into this. This is a valid point of view in the context that Desmet and Hekkert are working within, as they are both key figures of Emotional Design Research. However, for this research there isn't a prescribed hierarchy within these three levels and a new level is proposed, that of the Narrative Experience.

The framework is therefore revised into a Framework of Narrative Product Experience [Figure 15]. The Narrative Experience level is related to Aesthetic, Meaning and Emotional Experiences, but allows for the variable of time, organising the interchanges between these levels through different moments of a product experience. This implies the view that narrative construction as a cognitive process occurs in the user and is closely related to not only the retelling of the experience but also the memory of the experience and the in-the-moment interpretation of the sequences of events and cognitive/emotional processes which create a full experience. The concept of narrative construction as a process occurring in the user will be described in more detail in the section on Narrative Interpretation (Section 2.4, p. 73).

The Framework of Narrative Product Experience also partially maps against the Threads of Experience Model described above (McCarthy and Wright, 2004), with the Aesthetic Experience mapping against the Sensual Thread, the Emotional Experience mapping against the Emotional Thread and partly the Compositional Thread, and the Experience of Meaning and Narrative Experience mapping against different elements of Compositional and Spatio-Temporal Threads.
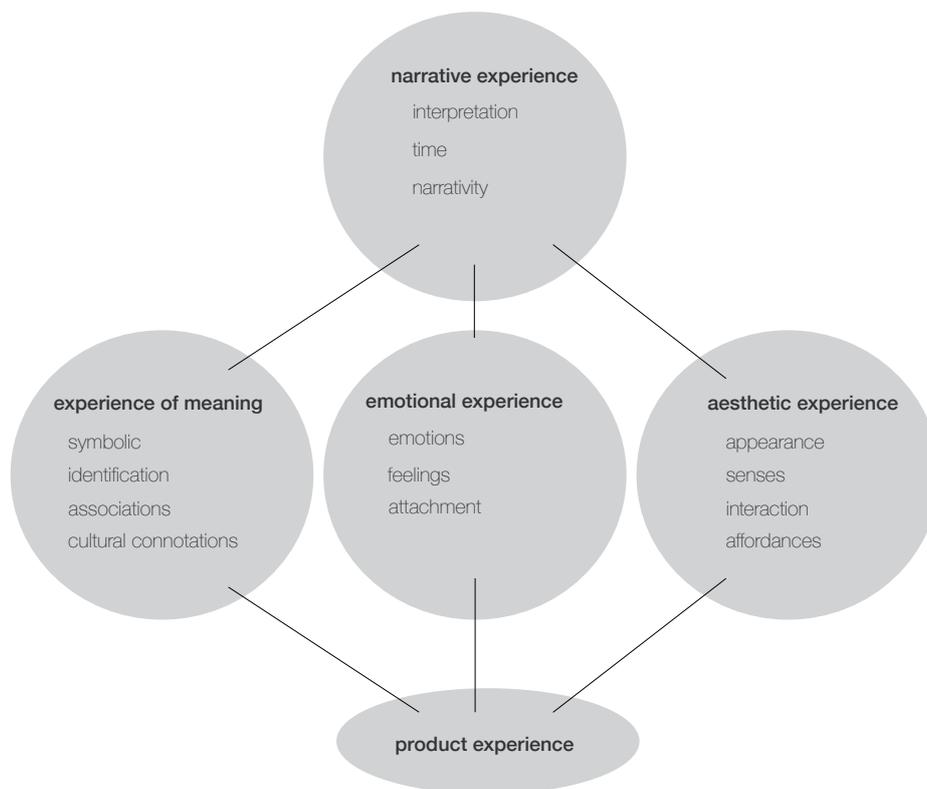
Figure 15 Framework of Narrative Product Experience. Source: Author's own.

2.2.1 Aesthetic Experience

Aesthetic Experience is the most immediate level of product experience, which can happen upon first sight of a product or through an interaction with this product. It is very much rooted in the senses, from visual, tactile, auditory, olfactory and taste systems to the kinaesthetic system. These senses allow people to understand the

product in front of them, in terms of shape, colour, size, texture, weight, temperature, hardness, material, and so on. These considerations not only allow us to understand what an object is, but also how we might approach it and how we might use it. When approaching an unfamiliar object, users will usually rely on the affordances of this object to understand how to interact with it and how to use it.

Affordance is a term first coined by Gibson (Gibson, 1986), but it is used within design with slightly different connotations to its original meaning. According to Gibson, affordances are all action possibilities of an object or environment, regardless of whether these are perceived by the user or not. Norman (Norman, 1988) used the term in a different way, to signify the properties of objects which give clues as to how people are meant to approach these objects. "Knobs are for turning. Slots are for inserting things into. Balls are for throwing or bouncing" (Norman, 1988, p.9). Norman's definition of affordance focuses on the perception of the user, while Gibson's focuses on the possibilities of the environment. This is an important distinction, as within an aesthetic experience what is most relevant for a designer are the perceived affordances of a product, as these will help to guide the user in how to interact with the product. Hence Norman's definition of affordance is the one that is commonly used in design.

Interaction falls within the realm of aesthetic experience, for example through touch or kinesthesis, and is also guided by the senses and our understanding of affordances. An aesthetic experience of a product interaction includes those features of the way in which the product interacts with the user, for example the simplicity of understanding how something might be opened, or the ease of slotting one piece into another in a three-dimensional puzzle. Interaction as addressed in the field of Interaction Design and Human Computer Interaction is usually applied to the study of digital objects, however the idea of interaction within the Design Research community is expanding to include non-digital objects and cultural conceptions of interaction, through the work of experience and interaction designers and theorists such as Bardzell and Blythe, who introduced the idea of interaction criticism as a culturally based activity drawing on art criticism (Gaver, Beaver and Benford, 2003; Blythe et al., 2010; Bardzell, 2011; Hassenzahl, 2011); and Hassenzahl and his research group first at Folkwang University and then at the University of Siegen, who are looking at interactions with a range of different non-

digital object through the lens of interaction and experience design (Hassenzahl, 2010, 2011; Karapanos, Martens and Hassenzahl, 2010).

2.2.2 Experience of Meaning

Experience of Meaning relies on the user's cognition and cultural context and associations. This form of experience is necessarily culturally specific because the ways in which people understand and create meaning are related to a whole series of social factors, ranging from geographical location to social class and education. Bourdieu, from a sociological perspective, uses the concepts of cultural capital and habitus to explain the creation and propagation of the distinction between different social classes, and how this can be transmitted through the generations (Bourdieu, 2010). However, it is interesting to explore these concepts in relation to the ways in which people interpret clues in objects and environments in order to form an understanding of the meaning of these. Bourdieu talks about the way in which works of art are interpreted, based on a system of cultural codes that are acquired through education or through early exposure to art through the family. The concept of habitus extends this culturally specific understanding to other areas that are seen as more mundane, such as everyday objects, cuisine, clothing, stating that individuals from different social classes use taste to distinguish between those things that are appropriate to the tastes of their social class (Bourdieu, 2010). It is important to acknowledge these culturally specific codes when looking at domestic objects, as they will affect the interpretation of these objects. A description of the role of the user's interpretation within this study is outlined in the section on Narrative Interpretation within this chapter (Section 2.4, p. 73).

Two works influenced the choice of domestic products for this study as well as the approach to meaning creation, Csikszentmihalyi's *The Meaning of Things*, and Miller's *The Comfort of Things* (Csikszentmihalyi and Halton, 1981; Miller, 2008). Both these works started with ethnography-based studies of a range of families, focussing particularly on the possessions of these families within their homes and how these can be used to paint a picture of the people's personalities. Csikszentmihalyi talks about the ways in which objects are interpreted and how this is culturally specific, and sees objects as signs, which convey some information to an interpreting person (Csikszentmihalyi and Halton, 1981). In particular, Csikszentmihalyi analyses possessions within a domestic environment, and sees them in relation to the owner's personality, not only as social signs but also as

things that provide something to the owner, and this something is defined in terms of meaning and in terms of emotion. In terms of meaning Csikszentmihalyi sees objects as representing aspects of the self, such as personality or interests, and status, either in terms of differentiation from other people or in terms of integration into wider society. In terms of emotions Csikszentmihalyi analyses the ways in which memories, associations and experiences (among other characteristics such as intrinsic qualities, style, personal values, utilitarian function, and the association to particular people) contribute to certain possessions being cherished more than others. Miller uses ethnographies of a whole street in London to analyse the different personalities within the street and how much the people who inhabit the spaces are reflected within the space and the objects within it. In so doing, Miller uncovers the ways in which objects contribute to processes of identity creation, as well as memory, grief, loss, family togetherness and social relations, and effectively uses the possessions and home environments as the focus of a portrait of a number of participants (Miller, 2008).

The experience of meaning in the sociological and anthropological sense, as described by Bourdieu, Csikszentmihalyi and Miller (Csikszentmihalyi and Halton, 1981; Miller, 2008; Bourdieu, 2010), however, tends to be seen as a static property of the relationship between user and product. This research is interested in the ways in which the experience of the object comes to form part of the interpretation over the time of the interaction, and the ways in which different elements within the design might guide this interpretation.

Within the theory of product design, Markussen et al. have written one of the few papers that describe the process of meaning creation over time during a product interaction, in particular through product metaphor (Markussen, Ozcan and Cila, 2012). Markussen et al.'s approach acknowledges that meaning creation is subjective, yet it is based on certain attributes of the product. It also introduces the idea that over the time span of an interaction with an object the way meaning is attributed to the object might change. This is in part because the mode in which we experience the object changes (in the example of the paper by Markussen et al., the change is from visual to tactile) but also because the change in mode might trigger different associated ideas. Markussen et al. refer to this interplay between different conceptual associations related to products over the time of an interaction as product blends. Conceptual associations can help to create meaning for the product over the time span of an interaction, and these associations can be cultural, social or personal.

2.2.3 Emotional Experience

The emotional response in the user during a product experience can be described as an Emotional Experience of the product. An emotional response can be caused by any aspect within the Aesthetic Experience (such as the senses) or within the Experience of Meaning (such as a cultural connotation). In turn, the Emotional Experience can influence the Aesthetic Experience or the Experience of Meaning.

Emotions are defined in different ways by different scientists, psychologists and neurologists and there isn't a consensus in terms of what an emotion is and how to define this. Desmet and Hekkert within the Framework of Product Experience refer to appraisal theory, which defines an emotion as the result of a person's appraisal of a stimulus; this makes an emotion a relational construct that is dependent on both stimulus and person (Lazarus, 1991; Scherer, Schorr and Johnstone, 2001; Desmet and Hekkert, 2007). This implies that the emotional experience is dependent on a cognitive evaluation of the stimuli in the product.

Damasio offers a neurologically-based theory of emotions which separates the concept of emotion from the concept of feeling and places these on two different levels (Damasio, 2000). In Damasio's theory an emotion is an unconscious reaction to an external stimulus, and these reactions exist not only in humans but across species; emotions are dependent on basic instincts as well as on acquired knowledge about the world, and the emotional system helps people to avoid danger and flee when necessary to stay alive. A feeling is instead a cognitive assessment of the emotion, based on an interpretation of the way in which the emotion affects us as people. Both emotions and feelings can be elicited by real events or by thoughts such as memories (Damasio, 2000, 2006). This is an important distinction because it calls into play the relationship between an emotion as an automatic reaction, and a feeling as a second level that is more related to cognitive processes.

Damasio arrived at an important breakthrough by studying people with brain damage in the areas of the brain related to emotions. These people can lead normal productive lives, but exhibit particular problems when making decisions; their rational thinking is not affected, so they can talk through all the pros and cons of each decision, but they are not able to make even simple decisions and when they do they tend to pick options which are worse for their overall wellbeing. This shows that decision-making is as much an emotional process as it is a rational process

(Damasio, 2000), with clear implications for design when thinking of the decision-making inherent in the selection of a product as well as the longevity of our interest in it and our recall and word of mouth around the product.

The study of emotions within product design has led to work within the design research community to uncover how product emotions work and how designers could use them to their advantage. One of the main proponents of this inquiry is Donald Norman, who in the book *Emotional Design* extends the concept of usability to include emotional elements, claiming that products that elicit positive emotions work better because we are willing to forgive more of their flaws (Norman, 2003). Another strand of research within emotional design comes from the Design and Emotion Society, who built a community of design researchers around the Design and Emotion Conference of which Desmet and Hekkert are founders and chairs. Particularly relevant to this research, within this community, is the work of Steven Fokkinga, who is taking an emotional design approach to the ways in which mixed emotions could help create rich experiences, and is investigating what role narrative might have as a way of structuring these emotions within the experiences (Fokkinga and Desmet, 2012).

2.2.4 Narrative Experience

This research adds a Narrative Experience level to Desmet and Hekkert's Framework of Product Experience, in order to better account for several aspects of experience. The Narrative Experience level refers to the time-based alternation of different aesthetic, meaning and emotion experiences within a single product experience as well as the narrative construction and interpretation of this experience through memory, recall, or in-the-moment interpretation. For this purpose, Damasio's distinction between emotions and feelings (outlined above) is valuable because it separates different levels of an emotional experience, one immediate bodily reaction to a stimulus and one which implies some cognitive interpretation of this stimulus as well as an embedding of this emotion within a personal narrative (Damasio, 2000).

Miall, writing from the perspective of narratology and literary studies, goes one step further and uses the analysis of emotions and feelings that a literary text elicits in a reader to make a link between narrativity and emotion (Miall, 2011). Using Damasio's claim that emotions and feelings are inherently narrative (Damasio,

2000 cited in Miall, 2011), Hogan's claim that emotions are micronarratives or prototypical stories which we recall whenever we feel an emotion (Hogan, 2009 cited in Miall, 2011) and Nussbaum's claim that emotions are learned through stories (Nussbaum, 1988; Miall, 2011), Miall concludes that narrativity is an intrinsic feature of emotions and feelings. Miall argues that each emotion and feeling is a micro narrative, which has an implicit schemata of how the experience will unfold, involving an initial situation, a conflict and a resolution (Miall, 2011). "We are led to construe the events that prompt emotion in us in narrative terms" (Miall, 2011, p. 339). This will be explored more in depth in the section on Schemata (Section 2.4.1, p. 76).

Within the product design literature, duration over time is usually left out of the analysis of experience, preferring to focus on single moments. However, there are some studies within interaction design and experience design that take duration over time into consideration as an aspect of experience. On the one hand, there are macro approaches to duration over time in terms of the experience with a product over the whole lifespan of the relationship between the user and the product. Karapanos for example identifies three stages of interaction with mobile phones through a series of longitudinal studies with participants and outlines the differences of perception and assessment of the object depending on the stage of use the participants are at (Karapanos *et al.*, 2009; Karapanos, Martens and Hassenzahl, 2009, 2010). Ocnarescu proposes a framework which incorporates the time-based elements of user experience over time, pre-experience, first encounter, in-between experience, momentary experience, direct experience and post experience, with narrative qualities of that experience, and identifies narrative processes that happen at each of these stages (Ocnarescu *et al.*, 2012).

Narrative is central to Löwgren's interaction aesthetics, which focuses on the time-based aspects of experiences with interaction design in terms of dramaturgical structure and rhythm as part of an approach to interaction criticism which acknowledges that experiences and interactions happen over time (Löwgren, 2009). Benford focuses on trajectories as a way to describe user experiences as journeys through a system and analyses interactive user experiences in terms of space, time, roles and interfaces, drawing on a dramaturgy and performance-based approach (Benford *et al.*, 2009).

While Karapanos and Ocnarescu focus on the whole of a person's experience with an object or environment throughout the lifespan of the product, Löwgren's and

Benford's approaches focus on a more micro timescale, looking at one particular interaction experience. This research adopts a similar micro-level timescale, and analyses interactions with an object over the duration of a single complete interaction of use, for example from lifting a kettle off the base to fill it, to pouring the boiled water in a cup. This research looks at this single complete interaction as a self-contained narrative with a beginning, middle and an end. Elements of Aesthetic, Meaning and Emotional Experience inform the user's Narrative Experience of the object.

2.3 What is Narrative? Definitions of Narrative for Designers

Narratives are both ubiquitous in life and extremely varied in nature; an anecdote shared at an office water-cooler and Homer's Iliad are both narratives. It is therefore difficult to converge on a single definition or set of characteristics that describes all types of narratives. The wide range of disciplines that have studied this subject, including narratology, linguistics, literary studies, film studies and philosophy, have defined narratives with a great number of different characteristics, some of which are more relevant for design, such as the occurrence of events, characters, causality, and elicitation of emotions, and others that are less relevant for design, such as the role of the narrator in a written text, which is not as obviously mapped against the way in which narratives are used in design. Definitions of narratives range from very broad to very specific. The most minimal definitions (Abbott, 2008) cover almost any representation of events, whereas the most exclusive definitions (Propp, 1968; Aristotle, 1987; McKee, 1999) are limited to the kind of narrative one finds in novels, theatre and film. Because of the huge range of definitions, it is onerous for designers to delve too deeply into the minutiae of the interpretation that each scholar and school of thought makes of narrative. To this purpose this section will present a simplified range of five definitions which can be used by designers when analysing or creating narratives within their practice. This is by no means a conclusive study, but it is a working model that can be adapted where needed.

The starting point for this analysis was a collection of "minimum requirements" for something to be considered "a narrative". This collection is taken from definitions of "what a narrative is" by a series of prominent narratologists from different schools of thought within narrative theory including structuralist, post-structuralist and congnitivist approaches and drawing from literary studies, linguistics and film studies. While this is not a comprehensive review of all definitions of narrative that exist within different fields, sampling from the main theorists within the main schools of narrative theory is enough to allow an analysis of the requirements for something to be called narrative.

These definitions were collected into a matrix which identifies which elements are necessary for something to be considered a narrative in that particular definition, such as a number of events, characters, entities or agency, structured progression, cause-and-effect relationships, logical connections, heroes and antiheroes to name some. The Matrix is attached in Appendix 4. The elements were then grouped in

order to establish five simple definitions, aiming be accessible to designers but still grounded in narrative theory.

These definitions create a summary of narrative theory that designers can apply within the design process or within narratives that may be created for the user to experience. Five definitions were found to provide enough detail for designers while still being sufficiently accessible, without being over-complicated. Each of these definitions is progressively more specific than the one preceding it. Put another way, each subsequent definition attributes an increasing number of characteristics, thus narrowing the range of phenomena it considers to be a narrative. These definitions are meant to be interpreted in terms of "narrative levels", so designers can pitch their narrative construction at a particular narrative level, or can analyse their previous work to identify on what definition level their narratives exist. These characteristics are displayed in Table 3, and explained in the subsequent definition descriptions. The table is not meant to imply a qualitative hierarchy between different types of narratives.

This series of definitions was developed as part of a workshop with Steven Fokkinga at TU Delft and Ioana Ocnarescu at Bell Labs Paris, leading to a co-written paper, reviewing the use of narrative within product design. This paper was peer reviewed and presented at the 2013 Designing Pleasurable Products and Interfaces conference and published in the proceedings (Grimaldi, Fokkinga and Ocnarescu, 2013) and is attached in Appendix 2. For the purpose of this study the definitions are valuable as a way of analysing the type of narrative present within a user experience of a product.

Definitions What	D1 Minimal Narrative	D2 Sequenced Narrative	D3 Logically Sequenced Narrative	D4 Value-Laden Narrative	D5 Entertainment Narrative
	Narrative is a representation of events	Narrative is a representation of events providing **chronology**; including characters or entities	Narrative is a representation of events providing chronology; including characters or entities who act with **causality** or **agency**	Narrative is a representation of events providing chronology; including characters or entities who act with causality or agency. It transmits **values** and **emotions**	Narrative is a representation of events providing chronology; including characters or entities who act with causality or agency. It transmits values and emotions; it is **structured** to proceed through **conflicts** and **climax**

Table 3 Narrative Definitions

(D1) Minimal definition of a narrative: Narrative is a representation of one or more events.

An example from this minimal definition is the one-sentence narrative *It started to rain.* It is a simple representation of an event, a "telling" of a story – a change in weather – rather than the event itself. This is the broadest possible definition of narrative: it includes nearly any account of any event, and it is used by theorists such as H.P. Abbott (Abbott, 2008) when an inclusive definition is required, for example when analysing narratives which are not specifically a literary text (e.g. (Löwgren, 2009)).

(D2) Definition of a sequenced narrative: Narrative is a representation of one or more characters or entities in a series of chronological events.

Example: *Mary was cycling home. She put her bicycle in the bike stand. She opened the door of her house and went inside.* The character Mary undertakes a

number of activities in sequence. Such a narrative is for instance constructed when someone recalls a simple experience, or is imagined by children in make-believe play. It can also be the format of a written record that keeps track of a succession of events in a strictly factual way, as anthropologists or a courtroom clerks may draw up. The D2 definition is similar to Chatman's (Chatman, 1978), that states the minimum definition of narrative requires characters (or entities, existents, inanimate characters) and a chain of events. This definition ties closely with a structuralist and a semiotic approach to narrative, which tends to identify actants and sequences of events in time and their formal relationships (e.g (Genette, 1980)).

(D3) Definition of a logically sequenced narrative: Narrative is a representation of one or more characters in a series of chronological events that are connected by causality or agency.

Example: *John was walking outside. It started to rain. John got wet, so he put up his umbrella.* The reader interprets that John (a character) got wet (event) because it had started to rain (causality), which made him decide to put up his umbrella (agency). Simple narratives with causation are for instance used in product marketing: *Drinking this fruit drink will make you healthier than drinking the other brands, because it contains added vitamins.* This narrative is more effective than the two separate statements without the causal link. Simple narratives with agency are used in design, for instance in user insight stories: *Mary bought this car because she likes the way it looks and because she was previously disappointed with cars from other brands.* The narrative gives insight into Mary's decisions and behaviour. Causal links between events are particularly important in Bordwell's definition of narrative in film (Bordwell, 1985) while agency is an essential element of fabula construction according to Bal (Bal, 1997). This definition aligns closely with cognitive narratology, in which the focus is on the reader or viewer's understanding of the story (Bordwell, 1985; Herman, 2004).

(D4) Definition of a value-laden narrative: Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency.

An example that fits this definition is the story of the ant and the grasshopper by Aesop, which can be summarized as follows: *The grasshopper laid back, enjoyed the summer and did not think of the future. The ant, on the other hand, worked hard to build a food supply for himself. In winter, the grasshopper died of starvation, while the ant survived.* This story evokes emotions about the behaviour of the characters, and promotes a moral value: *diligence pays off in the long run.* Such narratives can be used to influence user behaviour. For instance, narratives about product sustainability are set up to evoke certain emotions (shame about one's own behaviour, anxiety for the fate of the planet, compassion for the victims of pollution, etc.) and are meant to affirm good and bad-valued behaviour. In literature, Tan (Tan, 1995) is particularly interested in the way film narratives evoke emotions, while Herman (Herman, 2004, 2007, 2013a) is concerned with the cognitive process used by the viewer to interpret the narrative, including the processing of emotions. This definition aligns closely with a functionalist approach to narrative, which is concerned with the effects of narrative on the audience (Bruner, 1991).

(D5) Definition of an entertainment narrative: Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency, and which progress through conflicts toward a climax.

Most narratives designed to entertain and engage adhere to this definition. For instance, consider the fairy-tale Little Red Riding Hood. The story progresses through several conflicts (e.g. between the wolf and the girl, and between the wolf and the lumberjack) towards a negative outcome (grandmother and the girl are eaten by the wolf) but ultimately into a positive climax in which the lumberjack kills the wolf and saves the victims. The story evokes emotions like anxiety, fright, anger and relief through the different events. In addition, several values can be attached to the story, such as 'evil sometimes comes in disguise' (the wolf dressed in grandmother's clothes), and 'eventually good conquers over evil'. This definition is apparent in the structure of typical Hollywood films, which McKee describes at

length (McKee, 1999), as well as in Aristotle's description of the features of tragic plays (Aristotle, 1987) and Propp's classification of traditional fairytales (Propp, 1968).

These five definitions allow a comparative discussion on the different occurrences of narratives in design practice and on which 'definition level' these narratives exist. Sometimes, when the idea of narrative is used in design it is used to assess whether something is or is not a narrative; however, from this analysis of definitions of narrative the question becomes less relevant. If minimum narrative is broadly defined as events told or interpreted by someone, any described experience could be analysed as a narrative. It is more interesting for designers to use the definitions to analyse which narrative elements are present in their design and which could be added or subtracted to the narrative implicit or explicit in the design to make it a more engaging, meaningful and/or memorable narrative. In addition, elements from each definition can be incorporated into the design process to create products which trigger specific types of narratives. These narrative elements and definitions will be used as part of the design process in Section 4.1.2 (p. 132) and Section 4.3.2 (p. 179), and as part of the Narratives in Design Toolkit in Section 4.2 (p. 146) and Section 4.4 (p.191).

The above analysis has drawn one main question when presented at conferences and when in discussion with researchers with a narratology background, that these definitions all adhere to a traditional model of narrative with a sense of chronology and plot, while some branches of narrative theory have developed further from this model into analysing non-linear chronologies as well as different modes of narrative delivery. This is a very valid criticism, but it has not been taken on board in further versions of these definitions for two specific reasons. Firstly, the premise of this research is that any user experience with a product is interpreted, remembered and retold in narrative form; but while this narrative of product use may not be particularly interesting or engaging, it already qualifies as a non-traditional narrative in itself. Secondly, traditional narratives are better suited as examples to draw on for this research as the goal is to provide tools to help make these non-traditional narratives of product use more *storylike*, traditional narratives being more *storylike* by definition.

2.4 Narrative Interpretation

When we retell a story about an interaction with a product we often give the product human characteristics, such as a "stupid" automatic cash register in a supermarket, or the door lock that "won't behave" and "let you" into your office. It is hard to separate these human-like characteristics from the story; they are part of how we interpret events or happenings within our experience, and part of how we understand and remember the interaction. In narrative terms, the product's perceived will amounts to agency. Agency is what distinguishes a "happening", for example "it started to rain" from an "event" for example "I decided to open my umbrella" (Abbott, 2008). In the first example the event recalled is classed as a happening because there is no agency or will that decides to make this happen, while the second event clearly is the result of a wilful decision. The concept of agency in relation to objects has been explored in several different contexts, such as anthropology through the context of materiality and material anthropology (Gell, 1998; Miller, 2008), and in the context of sociology through the analysis of the meanings given by society to objects (Csikszentmihalyi and Halton, 1981; Bourdieu, 2010) and Actor-Network Theory (Latour, 2007).

Bourdieu (Csikszentmihalyi and Halton, 1981; Bourdieu, 2010) describes the social significance and meaning of objects within particular contexts of social class, and the role of these cultural objects in enabling people's roles in society. Miller looks at the roles of objects in the formation of people's identity, especially in terms of domestic objects (Miller, 2008) but also in terms of rituals of grieving and loss (Miller and Parrott, 2009). Both of these approaches resist attributing agency to objects; the objects are bearers of meanings that may be personal (Miller) or social (Bourdieu). Latour advocates Actor-Network Theory (ANT) in the book Reassembling the Social (Latour, 2007). ANT is centred on the idea of objects being social agents on the same level as humans. However, through ANT, Latour focuses on redefining the practice of sociology and its idea of "social" in order to include objects as social entities with agency; through ANT it is possible for sociologists to acknowledge the role of objects in society. "[T]hings might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on." (Latour, 2007, p.72). While this allows a different point of view for sociologists looking at objects, it seems somewhat redundant for designers. Theories of design, in particular human-centred design, emotional design and experience-centred design focus on the ways in which products affect people, and are in fact cited by Latour when explaining ANT.

Alfred Gell (Gell, 1998) analysed the idea of agency in relation to artefacts from an anthropological perspective, and concluded that artefacts possess agency when they allow events to happen "in their vicinity". In Gell's analysis, artefacts acquire human-like characteristics when they are perceived as having influence on the course of events. We therefore tend to interpret, recall and retell interactions with particular artefacts as an interaction between two beings, because in this narrative both beings (user and artefact) possess some form of agency. Mieke Bal in Travelling Concepts in the Humanities (Bal, 2002) goes one step further, using her background in narratology to develop a narrative theory of interpretation. She starts from questioning the traditional art-historical focus on the artist's intention when interpreting works of art; she then looks at the agency of the object and how the object itself communicates to the viewer, in ways in which the artist could not have predicted. This shifts the focus of our interpretation from the maker of the work of art to the actual work of art and its agency. From here Bal brings the argument one step further, from the maker, to the object, to the viewer, through the concept of narrativity. Bal focuses on the relationship between the viewer and the object, and how the "story" of viewing and interpreting the object is created in the viewer's mind. This focuses the critique of works of art, for the purpose of this research extended to include design, away from the artist's intention, through the agency of the object, and to the relationship between the viewer and the object. This relationship is not predetermined but can only be fostered by the maker's intention [Figure 16].

intention ———— located in the artist/designer

agency ———— located in the object

**narrativity** ———— located in the viewer/user
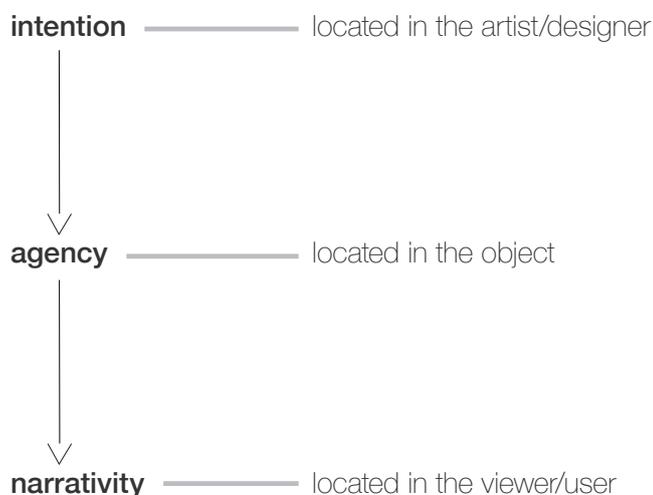
Figure 16 Conceptual model of the three levels of interpretation. Author's own image based on concepts from Bal (2002).

The focus on the cognitive activity of the viewer or user implies a narrative, because this activity necessarily happens through time, through an experience of viewing. "Narrativity is here acknowledged as indispensable, not because all pictures tell a story in the ordinary sense of the word, but because the experience of viewing pictures is itself imbued with process" (Bal, 2002, p.281). The time-based nature of the viewer's experience becomes the basis of narrative interpretation. This leads to a hypothesis that objects perceived as possessing agency may have more potential for narrativity. In addition, this model points to the idea that a narrative is always created in a user's mind when interacting with a product, and this narrative is central to the way the user will interpret, remember and approach the product. This implies a cognitive approach to narrative, informed by cognitive narratology.

Cognitive narratology is a relatively new branch of narrative theory focussing on the mind-based processes that happen in relation to narrative, and is transmedial in scope. This focus was brought about by advances in the study of psychological and neurological aspects of narrative, with work such as that of Young and Saver who studied patients with different types of neurological damage that affect the narrative areas of the brain. In the paper *The Neurology of Narrative* they describe the condition "dysnarrativia", which affects those people with a particular type of neurological damage in the areas of the brain that control narrative functions. They describe how through varying degrees, dysnarrativia can affect memory, or even the patient's whole understanding of themselves (Young and Saver, 2001). Young and Saver conclude that "narrative organizes not just memory, but the whole of human experience— not just the life stories of the past, but all of one's life as it unfolds" (Young and Saver, 2001, p. 75).

The psychologist Bruner looked at how narrative structures not only the way our mind represents events, but also our mind's construction of reality, and concludes that we interpret events through narrative processes; "we organize our experience and our memory of human happenings mainly in the form of narrative—stories, excuses, myths, reasons for doing and not doing, and so on" (Bruner, 1991, p. 4). Cognitive narratology allows for the study of conversations and real life events as narratives, and it implies the focus is on the interpretation of the narrative as opposed to the particular medium through which the narrative is presented (Herman, 2013b). Cognitive narratologists, in particular Herman (Herman, 2004), also focus on emotions and how these are elicited by narrative, and explain how

narrative acts as a cognitive macroframe to facilitate interpretation of events, in other words how "narrative is tailor-made for gauging the felt quality of lived experiences" (Fludernik, 2002; Herman, 2013a, para. 3).

Cognitive narratology also studies the ways in which people interpret and make sense of narrative worlds or *storyworlds*. The ways in which these storyworlds are constructed and presented, affect the interpretation of the narrative. "Storyworlds are mental models of the situations and events being recounted — of who did what to and with whom, when, where, why, and in what manner." (Herman, 2009 p.72-73). Storyworlds are the ways in which audiences process clues and information about the story's setting; as such they are constructed by the narrative's audience, but based on elements that are present in the narrative medium, such as descriptions, spaces and props. Visaulisation and creation of these storyworlds is an evocative process in the person experiencing the narrative and allows the audience to feel immersed in the story.

The concepts of agency and storyworlds, as well as the idea of structuring an experience over time as a narrative, are used as part of the set of "markers of narrativity" to guide the qualitative analysis of participant interviews about their use of the prototypes designed through this research (Section 5.2, p. 204).

2.4.1 Schemata

The idea that the process of story interpretation is an essential part of the activity of the film viewer or user is central to cognitive conceptions of narrative. Bordwell in particular (1985), when talking about the activity of the film viewer, states that the main activity of the (narrative fiction) film viewer is that of creating hypotheses about the way the story will develop, and then validating these hypotheses when the story develops as expected or disproving these when there are surprising turns of plot. Bordwell explains that this process of story construction is possible because we already have some expectations about the way events develop in everyday life, but we also have expectations about the typical forms of stories, the typical forms of stories within particular genres of films and the typical roles that agents such as characters, props, etc. might play. This is explained in terms of schemata theory.

Schemata are abstract structures which are culturally specific and derive from people's experiences of narrative, and are used in the process of interpreting and

76

making sense of narratives (Herman, 2013b). These schemata are central to the cognitive activity of story comprehension and allow for gap-filling within the narration, as well as enabling people to understand cause-and-effect relationships and chronology in non-linear narratives. In film, schemata aid the viewer to reconstruct the story from the information presented on screen, and aid in the forming of hypotheses, and therefore schemata are interesting to apply to the design of products. Two of the schemata that Bordwell describes (Bordwell, 1985) would be particularly valuable as a method of constructing narratives around product interactions.

Prototype schemata allow us to identify agents such as characters, props and locales as contributing something to the story, for example a character with a gun might be perceived as criminal or as someone who could potentially perform a criminal act. These agents allow us to start making some hypotheses about the way in which they will behave, or in the case of objects or locales, the way in which the characters might behave in their proximity, and then it is up to the filmmaker to either validate or invalidate these hypotheses. Prototype schemata in film use the semiotic understanding of the audience to drop clues into the story, which may or may not lead in the right direction, but will nonetheless be understood by a "typical" (and culturally specific) member of the audience. In parallel, semiotic understanding is often used in design to give clues to users about usability and interpretation of objects; however there is a potential for the designer to "play" with the idea of hypothesis validation or non-validation, which could lead to designs that reveal themselves with time to be surprising (Grimaldi, 2006, 2008).

Template schemata represent abstracted narrative structures that allow the viewer to slot information into the right sequence when reconstructing a story. Therefore, a story that is told in an order that is different from chronological can be understood in the correct chronology because we have these template schemata to assist us in "filing" the information into the correct place. For example, a sequence of cause-and-effect, regardless of what order it is presented in the film, will have to be unravelled in the viewer's mind in a more or less chronological order for the viewer to understand which event might be the cause and which might be the effect. Incidentally, stories which are told in a way that is close to a template schemata are easier to remember, and, regardless of what order the story was told in the original film, viewers will make the story conform more to the template schemata when retelling or recalling (Bordwell, 1985). Template schemata have to do with the understanding of the way time is organised within the film, and in a similar way

could help in the understanding of time within the interaction experience, creating for example patterns of surprise and predictability within the experience, or creating different rhythms and "dramaturgical structures" in the experience (Löwgren, 2009). In addition, a template schemata could help in the formation of cause-and-effect patterns, so that if an object behaves in a certain way we might ascribe a cause to that behaviour through a template schemata. An everyday example of this is when the TV remote-control is not working consistently, and we may try to turn it upside down; if it happens to work that time we tend to interpret that event as being the cause of the remote-control starting to work again, and the next time we will try to turn the remote-control upside down again to make it work.

Bordwell also describes two other types of schemata at work when watching films. These will be described only briefly as they are less relevant to this study. *Procedural schemata* have to do with the viewer's understanding of the story; these are the relationships between the parts of the story that don't necessarily relate logically but might be perceived as related because they are typical of a particular genre, or because they are necessary to the construction of an elegant story. *Stylistic schemata* have to do with the style elements of the film medium, such as camera shots, lighting, types of cuts between scenes (Bordwell, 1985).

Designers could use a template schemata to organise micro-events within an interaction that happen over time in a way similar to a typical story structure; in addition, a prototype schemata could be used to create recognisable features or details within the objects which may alter the types of hypothesis users make about the object and how it would behave. This might aid or foster the memorability of the object interaction, as well as the narrativity of the product experience. In this study, the Design Practice (Chapter 4, p. 123) will use the idea of organising micro-events within an interaction in a story-like structure, and will use features of the prototypes to prompt narrative interpretation in the user, with the aim of fostering the narrativity of the way in which the interaction is interpreted and retold.

2.5 Narrativity and Tellability as product qualities

In order to consider the narrative experience of the viewer in the product design process, designers need to reframe their conception of what elements comprise a product experience and in what ways these elements contribute to the user's narrative experience. To do this, designers need a basic understanding of what narrative is, as well as what elements of narrative could be used within design and alongside product design qualities.

Bal's model of narrative interpretation (Bal, 2002) shown in Figure 16, underlines the fact that the interpretation of an artefact is always embedded within a narrative process. When narrative is understood as a cognitive lens through which to analyse how users interpret interactions with things, then it becomes clear how understanding cognitive narratology concepts such as schemata can inform the design process. Because the premise of this research is that encountering and using an object can be seen as a narrative-based experience, narrative comes into play not only in terms of memory, recall or retelling of the experience, but also through the in-the-moment interpretation of the experience.

However, this does not imply that every product experience is necessarily an interesting, meaningful or worthwhile narrative. The term *narrativity* is particularly useful for this distinction, because by making narrative into a quality it implies the potential for it to be more or less present within an experience. Therefore, we could talk about experiences that have more or less potential for interesting, meaningful or worthwhile narratives, that is, experiences that possess more or less *narrativity*.

Narrativity cannot however be a quality of the product itself, as it is a quality that is tied to the retelling or interpretation of the product experience. For the purpose of this research it is important that a narrative quality can be incorporated within the product itself, describing the potential of the object to create an experience with high narrativity. Narrative qualities of the object will be referred to as *tellability* [see Figure 17]. *Tellability* in narrative theory refers to the noteworthiness of the events being related; high *tellability* in an event will then lead to high *narrativity* of the related story (Bruner, 1991; Baroni, 2013). The potential is for designers to create products with high tellability, by applying elements that are normally used within other narrative mediums, such as schemata, within the design process. The result of applying these elements to designing experiences with products might be

that the product actively encourages an increase in the gusto that someone might have in retelling the story of their interaction, thus fostering word-of-mouth and increased recall.

intention ——————— located in the artist/designer

agency ——————— located in the object

narrativity ——————— located in the viewer/user

tellability ——————— located in the object
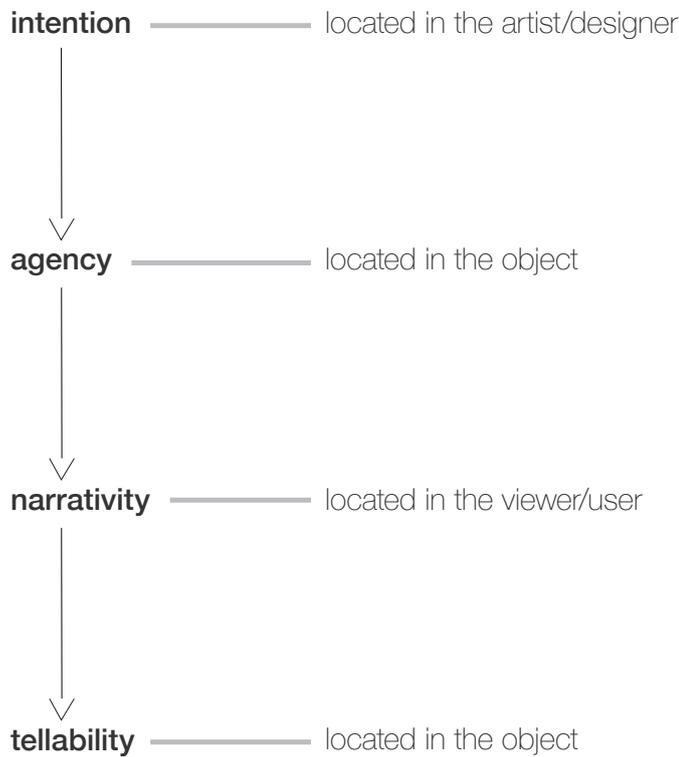
Figure 17 Expanding upon Bal's model (2002) to include tellability. Author's own.

Design practice can be assessed against the concept of tellability to determine whether the product has the potential of creating an experience that can be retold, remembered or interpreted with high narrativity. In this research, narrative films, as an example of a narrative medium, will be used as a starting point to incorporating narrative elements within the product experience, and tellability into the product itself. This will be described in more detail in the Methodology (Chapter 3, p. 84).

2.6 Insights and Conclusions to the Literature Review

The Literature Review grounds the study in cognitive narratology, therefore focusing on the effects of the narrative qualities of the product on the user's interpretation, memory and retelling of the product experience. This is an interesting development of the literature review because at the start of this research I had assumed that structuralist approaches to narrative would be the most valuable to the design approach. I initially thought that by studying the form and structure of traditional narrative mediums, as well as the elements that constitute a narrative, I could apply these to the design of products in a straightforward way.

When envisioning a structuralist approach, I thought that the most valuable narratology literature was going to be literature that broke down the elements that make a story and how these stories follow particular shapes (taking as a starting point Booker, 2004; Campbell, 2008; McKee, 1999; Propp, 1968; Vonnegut, as cited in Jones, 2014). I had envisioned that there could be templates that could be used to design an experience, following the shape of stories. This might still be a development of this work in a further iteration, as mentioned in Section 6.3 (p. 248) and Section 7.2 (p. 276), for example providing with the Toolkit a prototypical story structure, in the form of a graph that outlines the story beginning, conflict, climax and resolution, on which to model the product experience. This was considered, at this stage of the research, too restrictive for designers, and would work too much as a set model and less as a tool for reflection. In particular, this would provide a typical entertainment narrative structure, which may not always be the most appropriate for all product experiences.

While this approach is still valuable, as described in the Methodology (Chapter 3, p. 84), it also missed on some crucial details. This research uses a cognitive narratology approach to formulate why narrative is relevant to product design and what the effect of using narratives can be on the product experience. In particular, cognitive narratology led to the concept of tellability. This research also uses cognitive narratology to account for the process of story creation and interpretation that happens in the user during and after the product experience, explaining why the product can direct but not dictate the narrative ways in which a user might experience it.

The main insight from the Literature Review is also one of the contributions to the knowledge of this research: the concept of tellability as applied to a product. The implications of this insight are:

- **Tellability frames products as a narrative medium, containing the _potential_ to elicit narrative responses in users.** This implies that narrative responses can be designed for and considered as part of the product experience.
- **Tellability establishes narrative as a scalar quality of a product**. Though every product that is interacted with creates an experience that is interpreted, remembered and retold in narrative form, some of these experience narratives are more memorable, engaging and interesting than others. In other words, some of these experience narratives contain more narrativity (a quality of the experience narrative itself) or different types of narrativity.
- **Tellability helps designers consider which elements of their design could elicit a narrative response.** Tellability presupposes the link between qualities of the product and the ways in which these qualities may direct the user towards certain types of narrative interpretations.
- **Tellability provides a language for designers and design researchers to assess in what ways particular products are affecting the interpretation, memory and retelling of their product experience.** Providing a language facilitates conversations between designers that can be more precise and fruitful, because it allows for additional nuance in the discussion.

In the later parts of this research tellability will be used as a key concept in the idea generation as well as the testing phases. In order to analyse and assess the tellability of the product and the narrativity of the product experience, some of the key concepts described in this Literature Review will be applied to both phases of the research in order to identify narrative elements that may contribute to tellability:

- **The Framework of Narrative Product Experience positions the narrative experience at the centre of the product experience, with time as a focus of the interpretation.** The Framework of Narrative Product Experience as described above shows how elements of aesthetic

experience such as appearance, senses, interaction and affordances; elements of the experience of meaning such as semantic symbolic, attachment and identification; and elements of the emotional experience all contribute to the narrative experience of a product. This also conceptualises time as a central element of the product experience, which is reflected in the design process and methodology, and helps to define the time span this research focusses on, that of a single use interaction experience.

- **The Definitions of Narrative qualify different types of narrative that might be present, and the elements that constitute these.** The Definitions of Narrative are used in the Narratives in Design Toolkit (Chapter 4, p. 123) as well as in the design process (Section 4.1, p. 126, and Section 4.3, p. 173) to design narrativity into a product experience. The Definitions of Narrative are also divided into their component parts as a way to prompt design concepts.

- **The extrapolations of key concepts related to narrative within product experiences informs the ways in which people can analyse these experiences.** Key concepts related to narrative and described in this Literature Review: emotion, identity, agency, memory, and storyworld, are used in the analysis of the test data as "markers of narrativity", as described in the Qualitative Analysis (Section 5.2, p. 204).

Chapter 3: Methodology

As evidenced in Chapter 1 (p.31), Narrative is extensively used in product design in different ways, at different stages of the design process, and to create different effects. Typically, designers will use narrative methods of user research such as ethnographies, will present findings of user research in narrative form, for example through personas or user stories, will create associations to other stories or settings, for example by using semiotic reference within the designed form, or will create narratives that accompany the product, such as those developed through branding and advertising (Parrish, 2006; McCarthy and Wright, 2010; Grimaldi, Fokkinga and Ocnarescu, 2013).

An area of narrative design that is under-represented in terms of design practice and design research, and therefore is identified in Chapter 1 (p.31) as a gap in the knowledge, is the way narratives can be used to facilitate interpretations of, make sense of, or structure product experiences over the duration of a single interaction (see Section 1.3 Conclusions and Insights for an in-depth rationale, p.49). The framework of Narrative Product Experience, developed in Chapter 2 (Section 2.2, p. 55), frames how experiences can be looked at in terms of Aesthetic Experiences, Experiences of Meaning, Emotional Experiences and Narrative Experiences, with the Narrative Experience accounting for the relationships between all these different elements over time. To better understand this relationship, Chapter 2 identifies elements of narrative theory that can be used to define different levels of narrativity and identifies key concepts from narrative theory, such as narrative interpretation, schema, agency, narrativity and tellability, that can guide design practice methods and design strategies. In particular, the concept of tellability is key to the design practice hypothesis and the design testing methods.

Chapter 3 draws on a series of papers written within the last seven years. The section on product and film selection draws upon the paper *Cinematic Narratives of Product Interaction Experiences*, presented at the Design and Emotion conference in 2012, peer reviewed and published in the proceedings (Grimaldi, 2012) [see Appendix 5]. The section on the kettle analysis is adapted from the book chapter *Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences* within the book *Experience Design: Key Concepts and Cases* edited by Peter Benz, peer reviewed, and published by

Bloomsbury Academic in 2014 (Grimaldi, 2015) [see Appendix 6], and also draws on the paper *Story of Use* presented at the NorDes Conference 2013, peer reviewed and published in the proceedings (Grimaldi, 2013) [see Appendix 7].

3.0.1 Research Question and Gap in the Knowledge

Can design enhance the user's experience of interacting with a non-digital product through the application of narrative elements derived from film?

This research question implies a focus on several different elements, and guides the formation of the hypothesis and the methodology.

Enhancing user experience positions this research within the user experience tradition. The focus on the qualities of the user experience guide the research throughout all of its stages.

Interaction with a non-digital product positions this research at the crossroads of interaction design, because of its focus on the experience of the interaction, and of product design, because it limits the scope to non-digital products. The choice to focus on non-digital domestic products is explained in Section 3.0.3 (p. 88).

Application of narrative elements implies that the product experience has narrative qualities, which is developed through the hypothesis below. It also leads to research in the field of narratology described in Chapter 2 (p. 67 and p. 73), and guides the methodology.

Derived from film deriving the narrative elements from a specific narrative medium helps to limit the research within manageable parameters, while proposing that the films are used as starting points and source material for design. The choice to focus on film is explained in Section 3.0.3 (p. 88).

The practice review, in particular its conclusions in Section 1.3 (p. 49), identified a gap in the knowledge about the application of narrative principles to design: the narrative qualities of in-the-moment interpretations, recounting or memories of product experiences, within a single use interaction.

The literature review also identified an obstacle to this approach, that the field of narratology is vast and not homogeneous, requiring a selection of particular theoretical perspectives as well as adaptation and simplification of key concepts in order to apply these to design.

3.0.2 Hypothesis

The hypothesis emerges from the practice and literature review, in response to the research question, and guides the design practice.

> *Using a product can be looked at as a narrative experience, either through memory, recall or in-the-moment interpretation. Designers can therefore harness narrative elements from other mediums in order to create products that direct the user experience towards an enhanced narrative interpretation, in other words, create products that are more tellable. More tellable products lead in turn to users retelling their experience with more gusto, ultimately leading to more interesting and engaging stories about those products, stories with more narrativity.*

The focus in the hypothesis is on several elements:

Using a product can be looked at as a narrative experience, **either through memory, recall or in-the-moment interpretation.** This was outlined at large in the literature review (Chapter 2, p. 51) and practice review (Chapter 1, p. 31), and has implications on the practice methodology (Chapter 3, p. 84), in particular on the ways in which the prototypes are designed (Chapter 4, p. 123) , tested and analysed (Chapter 5, 195).

Designers can therefore harness narrative elements from other mediums is used as a guiding principle throughout the design practice (Chapter 4, p. 123) and is codified in the Narratives in Design Toolkit (Section 4.2, p.146, and Section 4.4, p.191). Within the parameters of the research question, film was chosen as a suitable medium. This is explained in Section 3.03 (p.88).

Create products that direct the user experience towards an enhanced narrative interpretation. This statement guides the testing and analysis of the design prototypes, which focusses on the user's interpretation of the experience as opposed to behavioural markers that are observable during the product experience. This is detailed in Section 5.2 (p. 204).

Create products that are more tellable implies that tellability is a scalar quality that can be designed into a product. In narratology, *Tellability* refers to the noteworthiness of the events being related; *tellability* in an event should then lead to *narrativity* of the related story (Baroni, 2013). The term is adopted in this research to describe the narrative potential of a product. A full explanation is in Literature Review (Section 2.5, p. 79).

This hypothesis develops through cross-fertilising the design of products, in particular non-digital domestic products, with narrative techniques, patterns and roles derived from the analysis of specific film examples. When using a product, a user will experience a sequence of events (or micro-events) related to this experience of use; in the case of a kettle the user will approach the kettle and see it, then fill it with water, place it on its base, turn it on, wait for it to boil, possibly notice the noise of the boiling water or the steam coming out of the kettle, then the kettle will turn itself off (or is turned off) and the user pours the boiling water and places the kettle back on its base. By manipulating or "directing" what these micro-events are, how and when they happen and what they communicate or represent to the user, and by creating consciously structured sequences of micro-events within this "single-use" experience of a kettle either from the point of view of physical interaction or from the point of view of emotional or cognitive responses, then the designer is able to affect the narrativity of this experience.

3.0.3 Parameters

This research focusses on non-digital products as well as products found in the domestic sphere. Digital products were excluded because of the conflicting expectations we place on the behaviour of digital products and the common lack of a relationship between the physical properties of the product and its function. Digital products can be made to react in any number of ways to any situation that they are presented with, and because of this we place less expectation on digital products in terms of how they will behave. Digital products are also increasingly designed as a "black box", we are used to having to explore these anonymised objects and having to find our ways around these.

On the other hand, we tend to both overlook and take for granted domestic products, as we are culturally very familiar with the way they look and the way they function. Many domestic products fall within common and recognisable archetypes, and they are products that we are familiar with from childhood. They also tend to be products we pick to surround ourselves with, as opposed to products found in the workplace or in public places, and they tend to have strong links to our sense of identity either through our purchasing choices, or through the familiar relationships that have unfolded around them (Miller, 2008). We trust these products and form attachments to them, for example when they are passed down through the generations, or when the products are present during significant events in our lives, and we imbue these products with meaning and identity (Csikszentmihalyi, 1981; Miller, 2008; Bourdieu, 2010).

Film was selected as a suitable narrative medium for this research because it is a self-contained experience, lasting about 90 minutes, and uses visual elements and props which lend themselves to be analysed in terms of design. Film is also particularly concerned with prompting an emotion in the viewer; as viewers, we invest ninety minutes of our time in the cinema to be engrossed in a story, to identify with the characters and to feel their emotions. It is argued that when a film does not make us feel emotionally invested, we don't think it's a good film (McKee, 1999). In addition, the ways in which schema are used in films to aid narrative comprehension (Bordwell, 1985) can inform the design process, for example by looking at what schema might be present in a particular interaction with an product, what is expected in terms of sequences of micro-events, and then in what ways can this sequence be changed or disrupted to change the message that the user

will interpret. Narrative feature films also tend to follow clear and traditional storytelling conventions; a fairly traditional narrative has the advantage that it is more likely to produce recognisable narrative elements such as narrative structures and devices. When these are analysed and used as source material for the design process it is then more likely that the narrative elements would be recognised as such on some level in the finished prototypes.

3.1 Epistemological Positioning and Fields of Study

This research is grounded in the field of product design practice, and as such it adopts many of the methods that are common practice within design practice research. This implies a methodology that involves design practice as a way to test theoretical assumptions as well as a way to generate more insights, design methods, and ultimately more theoretical knowledge. The research specifically addresses the area of design praxeology, or research into the process of designing (Cross, 2007), so in the first instance it is directly addressed to product designers. Action research and reflective practice are key methods within design, as researching the practice of designing implies the application of theoretical findings within a design process to create designed products, and reflecting on these actions and how they affected the design process and outcomes.

In particular, this research applies elements of narrative theory into design, and as such it tests theoretical positions and finds methods to apply these within the design process. The design outcomes of this study fall within speculative design and product design research, to avoid adding external constraints to the design process, such as client specifications, marketability or concerns around mass manufacture, which may confound the main aim to analyse the narrativity of the product experience. The choice to work with design research outcomes is also explained through Fallman's framework below (Fallman, 2008).

The research is therefore in the first instance directed towards those designers working within speculative design and product design research, as well as design students working within these areas. However, this research strives to produce knowledge that can be generalised and applied to other fields of design, and this will be discussed in Chapter 6 (p. 234).

Yee (Yee, 2010; Yee and Bremner, 2011) uses different classifications of design research in order to describe design PhD methodologies. In analysing case studies of design PhDs, she concludes that PhDs in design often don't fall neatly into categories, and instead use mixed methods (bricolage) that are suitable to the particular research. Yee's review of design research frameworks will be used as a way to position this study.

Frayling (Frayling, 1993; Yee, 2010) makes a distinction between research *into* art and design, research *through* art and design and research *for* art and design, and it is the most widely used framework for positioning design research. This research covers areas within each category, and as such the framework is not as valuable for positioning. This research is research *into* design because it researches and contributes theoretical perspectives on product design, positioning product experience as a narrative and using narrative theory to inform design. It is research *through* design because it uses action research by designing and testing prototypes based on theory, and describes the design process and design methods step by step, and some of the contributions to the knowledge are design methods. It is partially research *for* design because it communicates the research embedded within a piece of design, though it could also be argued that this research falls outside of the *for*-design category because the artefacts produced are not the end products of the research.

Cross' taxonomy (Cross, 2007) "is based on the focus of the investigation rather than on the method of research" (Yee, 2010 p.3) and as such is more valuable as a tool to position this research. Cross distinguishes between design epistemology, described as "designerly ways of knowing" (Cross, 2007), design praxiology, which studies the design process, and design phenomenology, which studies the product of design. The main focus of this research in terms of methods and contributions to the knowledge is in the area of design praxiology, contributing design practice methods as well as an approach to design practice. The study would also fall under design epistemology, as a lot of the methods used are "designerly", though this is less of a focus of the research. Design phenomenology is less prominent within this research; though the designed prototypes are studied and analysed, the main focus is not on the prototypes but on the process.

Fallman's model (Fallman, 2008; Yee, 2010) refers specifically to interaction design as opposed to being more generally about design (unlike Cross' model above) or about art and design (unlike Freyling's model above). Fallman defines the scope of

the framework as being positioned at the design end of the interaction design spectrum, and within the design tradition, distancing itself from HCI at the other end of the spectrum. As such, this research shares a lot of this ground, though it deals with product design it does so in a way that is focussed on "artifacts, with particular attention paid to the qualities of the user experience" (Fallman, 2008 p.4) including specifically physical, sensual, cognitive, emotional and aesthetic issues as well as a particular focus on content. The main distinction with the interaction design field as described in Fallman (2008) is that this research focusses on non-digital products, which is not usual of interaction design.
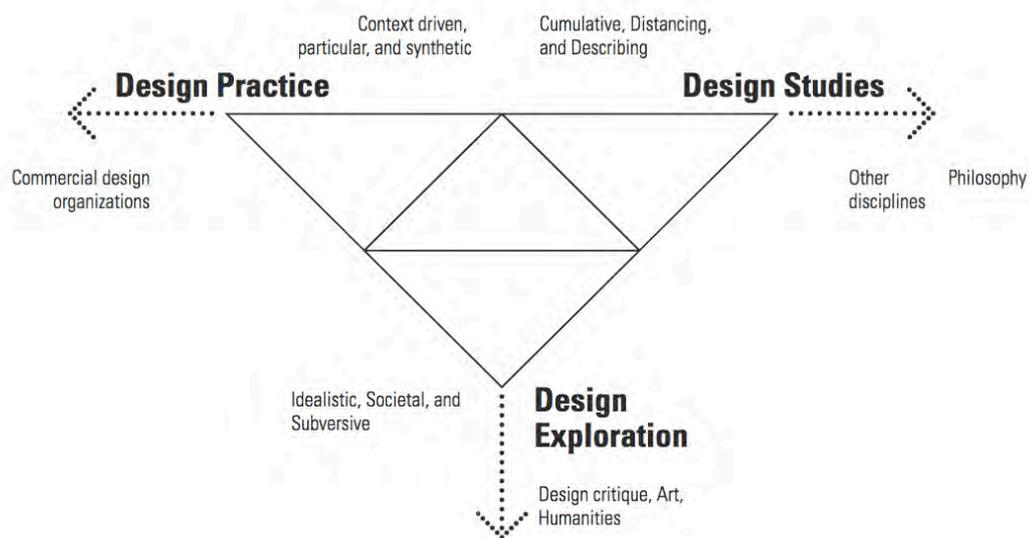
Figure 18 Fallman's interaction design research model. Source (Fallman, 2008, p. 5).

Fallman's model distinguishes interaction design research in terms of tradition and perspective, into three fields, Design Practice, which comes from a commercial tradition, Design Exploration, which is interested in societal concerns and "what if" questions, and Design Studies, which aims to develop new knowledge that can be generalised, often through the application of theory from other disciplines (Fallman, 2008).

As such, Fallman's model is valuable to positioning this research epistemologically. This research specifically avoided the commercial implications that are central to the Design Practice end of this model. This research doesn't fit in the main description of Design Exploration, which is to address "what if" questions and produce design artefacts that are in themselves critical, idealistic or subversive;

however, the aims of this research align with the other end of the Design Exploration spectrum, as described by Fallman, of creating research prototypes in order to create knowledge about user experience. The research prototypes created in this research are positioned within the field of speculative design and design research, which is coherent with this category. This research also focusses on Humanities-based methods and literature, such as ethnography, anthropology and sociology, coherent with the category of Design Exploration.

In its aims, this research can be positioned more firmly within the Design Studies tradition; it is a systematic enquiry, aiming to develop new knowledge. This research also aims to generalise findings from the design process to a wider application through formalising frameworks through which to analyse design work, toolkits to analyse and generate design work, and design methods that could be applied within other contexts. It appropriates theories from other disciplines, in this case narratology, and applies them to design. As such this research falls well within the Design Studies tradition.

One model not mentioned in Yee's paper but relevant to positioning this research is the Lab Field Gallery model proposed by Koskinen, Binder and Redström (Koskinen, Binder and Redström, 2008), because it focusses on design research, as distinct from commercial design practice, and is based on the positioning of design methods and experimental design practices within research traditions. Koskinen, Binder and Redström describe three different approaches to design research, which they call Lab, Field and Gallery, and base each of these approaches in a separate research tradition (Koskinen, Binder and Redström, 2008).

The Lab approach is derived from science, and tests design work in lab conditions, adopting scientific methods of analysis; Koskinen, Binder and Redström describe the TU Delft approach to emotional design as residing within the Lab approach. Though this research affiliates itself to the design and emotion tradition by studying emotional qualities of a product interaction, and by adapting the Framework of Product Experience from TU Delft (Desmet and Hekkert, 2007), it also uses a Humanities-based approach to the concept of emotion and to the process of gathering and analysing data. Therefore, this research borrows from the Lab tradition by producing design prototypes and testing them with users in lab-like settings, though the way the data is gathered and analysed falls outside of the scientific tradition, adapting from the fields of anthropology, ethnography and narratology.

The Field approach is derived from sociological theory, and places particular importance on studying design in its natural setting. Though the design prototypes produced in this research are tested in lab-like conditions, some of the concerns of the Field approach are central to this research: the focus on artefacts from ordinary social settings, the attention given to the unfolding of events, and the fact that the research data is gathered through conversations and focusses on the user's interpretation of the events. The methods for qualitative analysis of the research data are also coherent with this tradition.

Gallery is described as an approach that is based on the art world, and implies that the design work is the main outcome of the research. It also implies a non-scientific approach to the description of the research, for example omitting design process, and instead giving particular attention to the finished design artefacts. As such this research falls outside of the scope of Gallery, though the design prototypes could be understood within a tradition of speculative design, which naturally tends to revolve around the Gallery or showroom.

In terms of more discipline-specific definitions of the field of study, this research is positioned within the field of product design, as it is concerned with analysing the ways in which narrative theory can be applied to product experiences and the main design outcomes of this research are products. However, in terms of the concerns of the research, there is a lot of overlap with contiguous design disciplines of interaction design and service design. The conceptual focus of the research overlaps and borrows from interaction design as described by Fallman (Fallman, 2008), especially in terms of investigating the interaction between a person and a product through a humanities lens, and the attention to the user experience of artefacts. The focus on the time-based aspects of an experience is also related to service design, which uses methods such as service blueprints and journey maps as a way to describe events that happen over the time-span of a service (Kimbell, 2014; Stickdorn et al., 2018).

In addition, though the research is positioned within design, the conceptual frameworks and the premise of the study relies heavily on narratology. This guides the desk research, the methodology, the design methods and the testing and analysis.

3.2 Methodology

Based on the epistemological positioning in Section 3.1 above, the methodology was assembled from several different fields of study. The main fields of study are that of product design, from which action research and reflective practice are key methods used for the design practice. Interaction design provides the focus on the user experience, and service design methods were used as models for developing some of the generative design methods used in design practice, in particular those related to time. Design ethnography was used as a way to engage with participants because it is a common research method in design and it provides narrative data from the point of view of the participant or user.

Methods based on narrative are used at all stages of the research, analysis, design, testing and evaluation phases of the design practice. In terms of research and analysis, product experiences are researched by engaging participants in design ethnography and storyboarding; films scenes are analysed using a version of McKee's film analysis techniques (McKee 1999) and product experiences are analysed in terms of micro-events within the experience. In this research, the design practice uses briefs derived from the film analysis to generate design concepts, by using a method based on the breakdown of Narrative Typologies and Narrative Functions described in the Practice Review, together with Narrative Definitions described in the Literature Review, and cross-references these with the analysis of product experience in terms of micro-events. Testing takes place through a semi-structured interview format, and evaluation is carried out through qualitative analysis of the interview transcripts, with particular focus on the narrative qualities of the spoken accounts, to identify markers of narrativity.

As a consequence:

The practice review focusses on the narrative qualities of designed products, and the design examples are sourced from the fields of product design, interaction design, HCI and in a few cases spatial design. These examples are codified into a framework based on narrative principles, and the framework is then used to guide the design practice and testing.

The literature review looks at product experiences and narrative theory in parallel. Product experiences are looked at through the fields of design that have

mostly focussed on experiences over time, that of emotional design, interaction design and HCI. Emotional design and HCI approaches are positioned differently from this research, as explained in Section 3.1 (p. 89), but they are useful lenses through which to analyse time-based experiences on a micro level. To balance this, the Framework of Product Experience (Desmet and Hekkert, 2007), deriving from an emotional design approach, is broken down into its elements and analysed through a humanities-based approach, in particular looking at products through the lens of anthropology and sociology when looking at product meaning and interpretation, through the lens of psychology for the emotional elements as well as the elements related to affordances. Narratology is looked at mainly through a cognitive approach, as the focus is on the interpretation of the experience, however, a structural approach is taken to create narrative definitions that can be used by designers.

The **selection of products** for redesign uses questionnaires as a method to gather a large quantity of data quickly, and this was mainly used as a method of convenience, as it was important that the products selected for redesign were common archetypes and that they resonated with users. It was however structured in a way that allows for narrative answers through open questions, to elicit thought in the participant and to assess qualitative responses.

The **selection of films** to analyse used internet forums to select films in which particular products played a role. It is important that the products are remembered as playing an important role by a viewer, as this points to a rich interpretation of the role of the product. This also reinforces the cognitive narratology focus on user interpretation of the narrative.

Film scene analysis was conducted following standard methods from scriptwriting, in order to follow a process based on traditional narrative analysis. Elements relating to the role of the object were added to this analysis.

Product experience analysis followed design ethnography methods, triangulated to include both visual methods and methods that would produce a narrative account. Ethnographic methods reinforce the anthropological grounding of the research and are valuable to this research because they allow the participant space to interpret and narrativise their experience. The ethnographies can then be analysed as narratives.

Strategies for design practice are based on traditional design techniques of action research and reflective practice, but use the narrative frameworks established in the Practice Review and Literature Review within the generative phases. It is central to this research that narrative elements are at the core of the generative process, so elements from the film analysis create the briefs, while elements from the theoretical frameworks act as prompts within the generative process.

Design prototypes are tested using an informal semi-structured interview, in a lab-like setting in which the participants used the prototypes and then were engaged in a conversation about their own kettles as well as the tested prototypes. This follows a design ethnography model and provides the user's narrative accounts of their use of the kettles.

Interview transcripts are analysed based on key narrative concepts deriving from the literature review and the frameworks of narrative product experience developed in the practice and literature review. The qualitative analysis focuses on which types of narratives are present in the different interviews, in relation to which prototype is being described.

Design Methods are codified into the Narratives in Design Toolkit, which is tested with design students from different disciplines in both an analytic and generative way. It is important that the methods can be replicable and can be applied in different contexts, and that the frameworks deriving from this research are clear and easy to understand and apply.

To note, because I embarked upon this research as a part-time PhD, having already had some limited experience of academic publishing and design conferences, I made a conscious decision to make use of the wider design research community to inform my research process. As such a number of papers were written about the PhD while it was in progress, and submitted to conferences, as book chapters and to journals. For a full list see Appendix 1.

Feedback on the PhD-in-progress, has been provided not only by the supervisory team but also by a number of other experts in the field. Extensive and valuable feedback and advice was received from the peer review panels who reviewed my papers, editors who helped shape the form of some of the papers that were then restructured into thesis chapters, discussion panels following conference

presentations, formal collaborations through workshops and co-authored papers, PhD workshops attended, as well as informal conversations and advice both at conferences in response to paper presentations or in response to published work. This was particularly valuable to validate the gap in knowledge, selecting appropriate practice examples, selecting the literature to review, structuring the qualitative analysis, and validating the methodology.

3.3 Methods

3.3.1 Selection of Products and Films

The first step involved selecting which products would be researched and redesigned and which film scenes would serve as source material for the design process. To select the products a questionnaire was circulated online through message boards and social media targeting people that were local to London, so that they could be involved with further stages of testing, and that were somehow interested in objects. More than seventy people replied to the questionnaire, which had two open questions, asking the respondent for a list of the five domestic objects that first come to mind and then asking for a list of three objects that they most enjoy using, followed by space in which to write why they find each interaction enjoyable. This questionnaire was designed with a double aim: to select a number of products which may best lend themselves to this study and to select a number of participants who may be willing or predisposed towards talking about their interactions with products.

The question about enjoyment with products was mainly aimed at eliciting a descriptive response in the following motivation section. The aim of the participant research is to obtain a small number of in-depth qualitative interviews in narrative form, as opposed to studying reactions that can be generalised to a particular population. This follows the example of Dunne and Raby's participant selection methods in Hertzian Tales, in which they describe a similar approach to selecting participants (Dunne, 2008). Because of this, the questionnaire was posted on internet boards that are followed by people with an interest in objects, but not necessarily experts, designers or design students, such as the Freecycle network, DIY and Car Boot Sale online message boards. Products that were mentioned in the two categories were selected for further investigation. Products that could not be

redesigned for technical reasons, for example TVs, and products that would prove testing problematic, for example beds, were discarded. The final selection is the kettle, toaster, sofa and table, which was then be narrowed down to just the kettle in a further stage of research, because it proved more productive to investigate one product type more in depth and through a series of different treatments than to create one prototype for each product type. The questionnaire used and a breakdown of the answers can be found in Appendix 8.

In order to identify films in which the products appear in a narrative role, a request was posted on the Internet Movie Database (IMDb) forums, asking forum participants, who tend to be film enthusiasts, to identify film scenes in which the products appear and play a significant role. This method was preferred over trawling script databases for references to products, as the point was to identify those scenes in which the product had some sort of a memorable impact, and resonated with the viewer, whether in the narrative construction of the scene or in the formation of meaning, as opposed to identifying scenes in which the product simply appears. Some constraints were imposed in order to narrow the field based on several criteria: the films should be set in a domestic setting, so as to mirror the setting for the products that will then be designed; the films should be relatively contemporary, from the 1990's onward, so as to be created in a time period that reflects our own in terms of product featured and in terms of resonance of narrative style and storylines with a contemporary audience; and the films should be narrative in nature, as to be more universally understood than experimental or non-narrative films, as well as providing "prototypical narrative" material. The post was placed on the IMDb forum asking people to identify films in which the selected products feature in a significant role. This resulted in over 50 answers. For each product, four or five films were selected, taking care to have some variation in genres of films as well as in narrative roles the products perform. The posted questions and compiled results can be found in Appendix 9.

3.3.2 Analysis of Film Scenes

This research is interested in outlining methods for designers to enhance narrativity within the product experience, and therefore the idea is to analyse narrative elements of films in which the selected products play a significant role, and then to apply elements from these to the design of the products themselves, focussing

specifically on the interaction with the product and the product experience. The kettle was selected as the single product to redesign as it is easy to define a single interaction with a kettle, this has a clearly identifiable and relatively short timing, with a beginning and an end, and it is therefore an easy product to talk about in terms of single use experience. It is also a product that in the UK, where the research takes place, is ubiquitous and has strong cultural implications: kettles are present in the majority of homes and offices, and making tea for someone takes on emotional and cultural meaning. When visiting people's houses, an offer of tea is always forthcoming, and tea is offered as a way of taking care of people in moments of emotional turmoil (Fox, 2005).

Based on the IMDb forum responses, and after narrowing these down through the selection parameters outlined above, to form a selection of films from different genres, the films selected for the kettle were:

- Vera Drake (Leigh, 2004) a historical drama in which the kettle helps establish the character of Vera as a caring individual, and helps to frame her activity of providing illegal abortions as a caring act.
- Wristcutters: A Love Story (Dukic, 2007) a comedy in which the kettle's whistle is used as a device to cut from one scene to another.
- A Tale of Two Sisters (Kim, 2003) a psychological horror in which a boiling kettle is used as a weapon by a ghost-like entity.
- Secretary (Shainberg, 2002) a comedy/drama/romance in which the kettle is used to establish a domestic calm scene but in that same scene it is then used as a masochist's tool.

Figure 19 Four films and four kettles. Source: screenshots from (Shainberg, 2002; Kim, 2003; Leigh, 2004; Dukic, 2007); covers from www.imdb.com.

The film scenes in which the kettle appeared were analysed from different points of view. The first level of analysis followed McKee's guidelines on film analysis from the book Story: Substance, Structure, Style and the Principles of Screenwriting; this describes a standard method for film analysis and is directed towards a film studies audience (McKee, 1999). McKee's method involves dividing the scenes into beats or actions and noting down the timing of those beats. It then involves an analysis in terms of conflicts and goals of the characters as well as any changes in values and turning points in the beats.

In addition to the analysis based on McKee's framework, the films were also analysed in terms of the role of the products in the particular scenes, noting any points in which the products change meaning or in which the meaning of the product influences our understanding of the scene, noting the perceived agency of the product. Keeping in mind the Framework of Narrative Product Experience outlined in Section 2.2 (p. 55), the elements relating to the interaction with the kettle (as part of aesthetic experience), elements relating to the meaning of the kettle, emotions elicited within the scenes and narrative aspects of the scenes were noted.

Figure 20 Kettle Scene from Secretary. Source: screenshot from (Shainberg, 2002).

Pictured in Figure 20 is the "kettle scene" from the film Secretary (Shainberg, 2002). This scene unfolds as the opening credits finish rolling and it has been established that the protagonist has just left a mental institution and is trying to stop self-harming after coming back into the family home. The "kettle scene" starts with a calm domestic evening setting, with the protagonist in a bathrobe making tea; the calm is interrupted by a violent fight between her mother and her drunk father. The protagonist grabs the now boiling kettle, calmly brings it up to her room, and proceeds to burn herself with it on the inner thigh. This seems to relieve her apprehension, ending the scene on a calm note. However, we as an audience know that her goal is to keep herself from self-harming, so this is a very ambiguous resolution to the scene as the apparent calm is actually a very negative development for the plot. The kettle has a dual role in this scene: that of establishing a calm domestic scene, but also being a catalyst for action - it is a loaded weapon: by being hot it is ready to use. This particular kettle feels tacky and is very phallic in design, tying into the plot of the film in a symbolic way. The pacing of the scene is also interesting; starting out with longer beats, progressing through the middle of the scene in short beats with sharp editing and cuts, and then resolving in a long final beat in which the ambiguous nature of the restored balance is made evident.

Title: Secretary
Scene: 7.02 to 8.22 min
Object: kettle

Year: 2002
Genre: comedy, drama, romance
Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10 10 10 5 5 15 25 5

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved
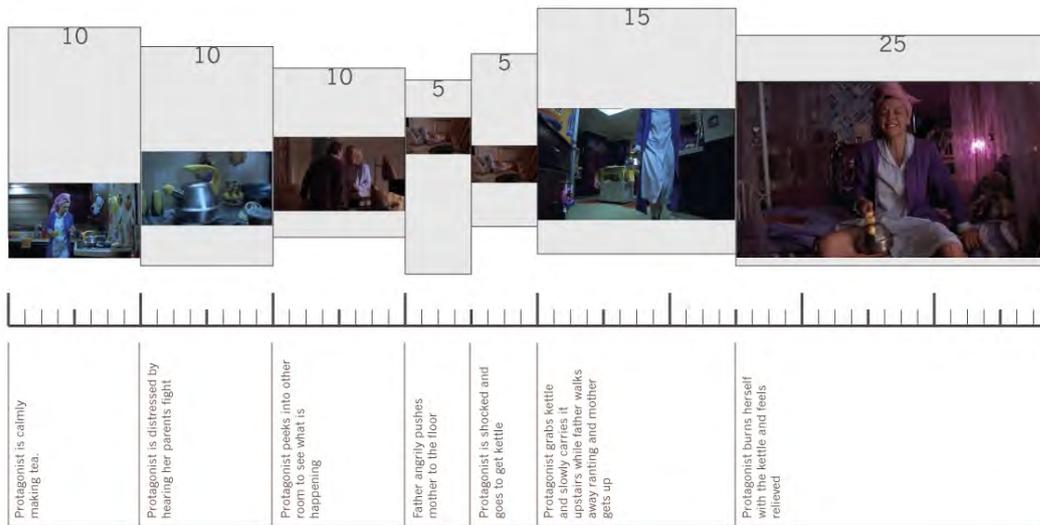
Figure 21 Beats in a Kettle Scene – Secretary. Author's own.

Figure 21 shows the beats in this kettle scene. For a full analysis of the kettle scenes from the four films refer to Appendix 10.

The film examples are used as starting points for the redesign of the products, through the idea generation process for the new designs. Some of the narrative devices of the films are incorporated into the idea generation process. The roles and meanings of the products are used as starting points for design, for example by looking at the role reversal between the kettle as a symbol of domestic calm and the kettle as an available weapon. And the timing and structure of the beats within the scenes is used as an organising principle for the micro-events within the interaction experience. Each of these approaches can lead to different design outcomes based on the four films analysed.

3.3.3 Analysis of the Product Experience

As a comparison to the film analysis, participant research was used to analyse the interaction experience of using a kettle, with methods derived from design ethnography. The participants were asked to film themselves using their own kettle at home. They then emailed the video to the researcher before their scheduled

interview, so the researcher conducting the interview would be familiar with it. The interview was conducted individually and in three phases. The first phase consisted of the researcher briefly interviewing the participant about their use of the kettle; the second phase was conducted while both participant and researcher watched the video of the kettle use, and the participants were asked to talk the researcher through the video. It is interesting to note that the answers to this second phase were different from the first phase answers, proving the need for such triangulation and for the use of video when the experience is not fresh in the participant's mind. When watching the film, the participants went more in depth about the details of the way in which they use the object, prompted by watching themselves on screen. But also, the unexpected result was that the participants were more open, admitting to quirks of use, such as performing a "limescale inspection" before filling the kettle, or about always rushing to the kettle as soon as it boils, claiming "I don't like to let hot water wait, it defeats the point in my opinion" (K0Chao-Chi). One participant admitted to reorganising all her kitchen things, putting the more expensive things to the front and hiding the cheap tea, though this obviously defeats the point of moving things around in the first place. A full list of interviews is found in Table 10 (p. 203).

The third phase of the interview consisted in giving the participants drawing and collage materials, and asking them to create a storyboard of their use of the kettle, followed by a few final questions about this storyboard exercise (See Figure 22 for a sample storyboard). One participant said that having to draw her kettle she realised that she doesn't really know where the on/off switch is located, nor what colour this is: she remembers that the colour of this light changes when the water boils, but is not sure from what colour to what colour. This storyboarding exercise also forced the participants to divide their product experiences into micro-events and this information was used when mapping the micro-events within this interaction to see which ones could be acted upon or modified. Sequences of micro-events within the product interaction experiences were outlined based on the interviews and storyboards. The experience of use of the kettle is broken down into micro-events, and these micro-events are classified as common, less common, or quirks; this is shown in Figure 23. The information about micro-events in the kettle use and quirks of use that emerged from the participants is valuable when redesigning the kettle to provide recognisable additional connotations.
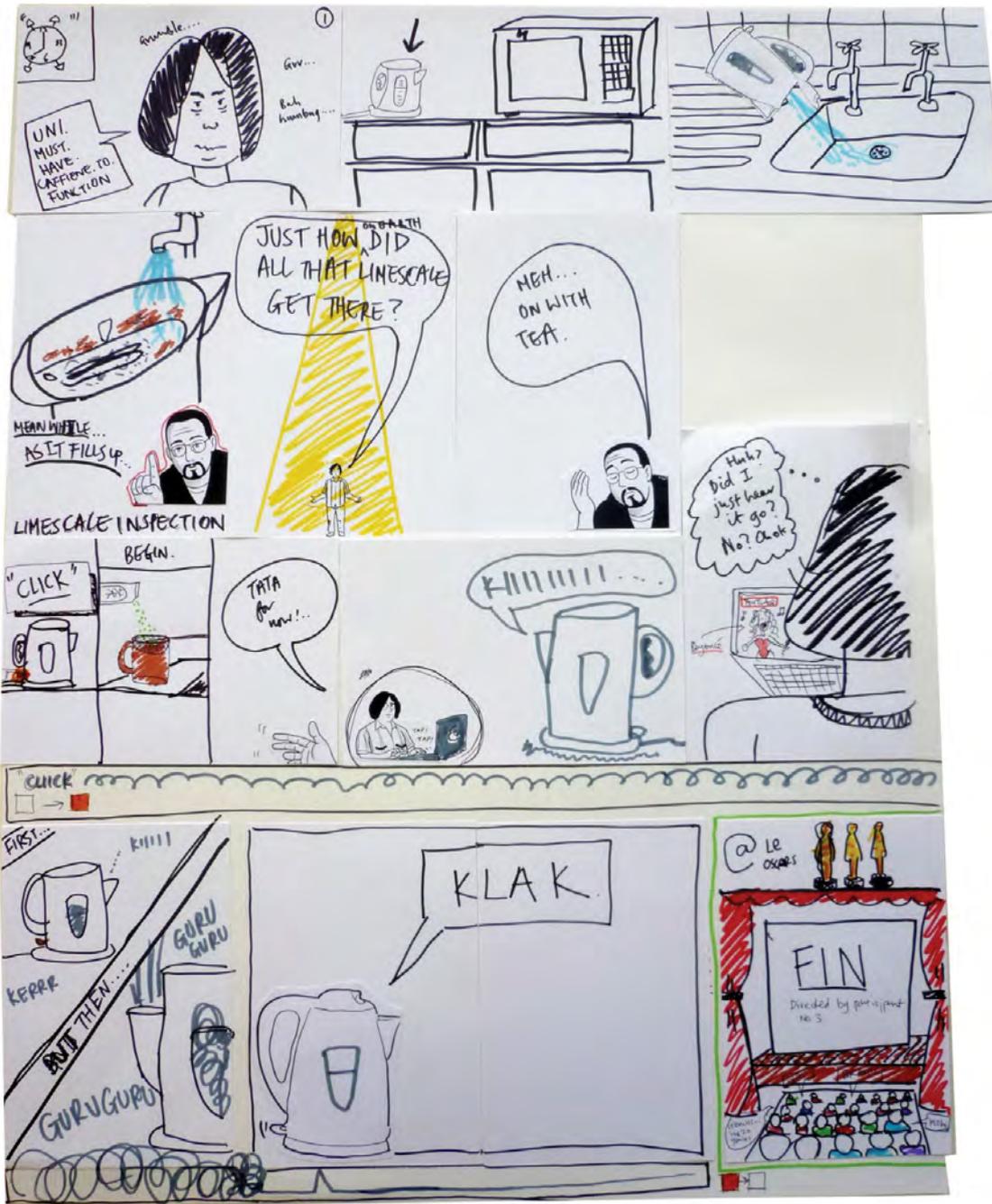
Figure 22 Participant's storyboard of kettle use. Participant work.

time	common	less common	quirk
	see kettle		
	lift off base carry to sink		
		open top empty out water	limescale inspection rinse out
	fill kettle	fill from lid fill from spout close top	
	carry to base replace on base		
	turn on wait for boil	observe light change do something else (leave/prepare tea/ etc.)	turn on repeatedly / double check / unsure if on check on kettle
	boil	know it's boiling from click / steam / noise / whistle turn off	run to kettle
	lift kettle off base pour water into replace onto base	cup / mug / pot / etc.	

Figure 23 Analysis of microinteractions with kettle in participant interviews. Author's own.

3.3.4 Strategies for Design Practice

The film analysis provides the raw narrative material to be adapted and adopted into the designs. This material comes from the form of the narrative (discourse) or the content of that narrative (story). For example, the meaning of the kettle in a particular scene leads to a series of design ideas and concepts (story), which may be varied in terms of how the product is experienced in interaction (discourse) according to particular template schemata found in the films. The narrative material from the film scenes is used to formulate a series of briefs. Some of the briefs that have emerged from the analysis of the four kettle films have to do with

- Role reversals: the kettle is usually interpreted as a reassuring product, but also has the potential of being used a weapon; this reversal of roles is used in the designs through contrasting connotations and through timed sequences of changes. One sample sketch concept for this brief is a kettle whose handle leaves a design on the user's hand, which could be seen as a scar but in a positive light.
- Micro-event structures: particular structures and timings of beats and scenes within a film are used within the kettle experience: the micro-events in the kettle experience are reorganised or timed so that particular events take more time and others are quicker, or are perceived to vary in timing, or so that there is a timing to a setting of the scene, climax of the scene and closure similar to that found in some of the film scenes. One sample sketch concept for this is a kettle that instead of signalling when the water boils it progressively starts glowing as the water gets hotter.
- Narrative devices or tropes: kettles are often used in films, and in particular in one of the films analysed, to cut from one scene to another, through the use of the whistle, the steam, and the sound of the water boiling. These time markers are used within the redesigned product experience as signifiers of changes in state or changes in meaning, or to create storyworlds. One sample sketch concept for this is a kettle in which the whistle changes in sound, sometimes resembling a child's scream, giving a sense of urgency, and sometimes whistling in a pleasant pitch.
- Symbolic meaning of the kettle: the idea that a kettle can establish a character as caring or a scene as calm and domestic, is used within the redesign, both by being subverted, and by being reinforced or played with in

an ambiguous way. One sample sketch concept for this is a kettle "clothed" in a knit sweater, with pockets to warm your hands.

The analysis of the participant interviews provides the raw material to map the product experience in terms of microevents. The literature and practice review provide different narrative categories and typologies of narrative use within design to aid in the process of idea generation. In order to cross-reference the briefs deriving from the film scenes with the product experience mapping and the narrative categories, a matrix was devised, which contains the Typology of Narrative Use in Design (Section 1.2, p. 42), Narrative Functions (Section 1.1, p. 35) and Narrative Definitions (Section 2.3, p. 67) on the horizontal axis, and microevents derived from analysis of the product experience (Section 3.3.3, p. 102) in the vertical axis. This is shown in Figure 24 and full size in Appendix 12. For each brief deriving from the film analysis, a series of sketch concepts are initially generated and placed on the matrix. The sketch concepts are then explored by moving them across the narrative categories or vertically through different microevents, or by combining different sketch concepts, so the matrix becomes a way to modify the initial sketch concepts and create new design concepts based on narrative principles.

Figure 24 Matrix used in the design process (full size in Appendix 12). Author's own.

Below are three examples of sketch concepts and how they plot through the matrix. The first brief, Figure 25, is based on the idea of a "kettle with ghost-like agency" deriving from A Tale of Two Sisters. This moves from *not fully predictable* as a narrative quality and *boil* as a micro-event, to *affect* and *whistle/run to kettle*, to *agency* and *boil*. This then becomes a new brief, "kettle that is mad (crazy)", and moves to *character/entity* and *wait for boil*, and *agency* and *wait for boil*. This movement is plotted in Figure 26.

In Figure 27 and Figure 28 are the sketch concepts and movement of sketch concepts based on the brief "calm to weapon", which derives from the films A Tale of Two Sisters and Secretary. In Figure 29 are the design concepts for the brief "sudden switch between worlds" deriving from the film Wristcutters: A Love Story, and in Figure 30 how these plot against the matrix. For a full set of sketch concepts please see Appendix 14.

Figure 25 Sketch concepts for "kettle with ghost-like agency". Author's own.

Figure 26 Movement of sketch concepts for "kettle with ghost-like agency". Author's own.

Figure 27 Sketch concepts for "calm to weapon". Author's own.

Figure 28 Movement of sketch concepts for "calm to weapon". Author's own.

Figure 29 Sketch concepts for "sudden switch between worlds". Author's own.
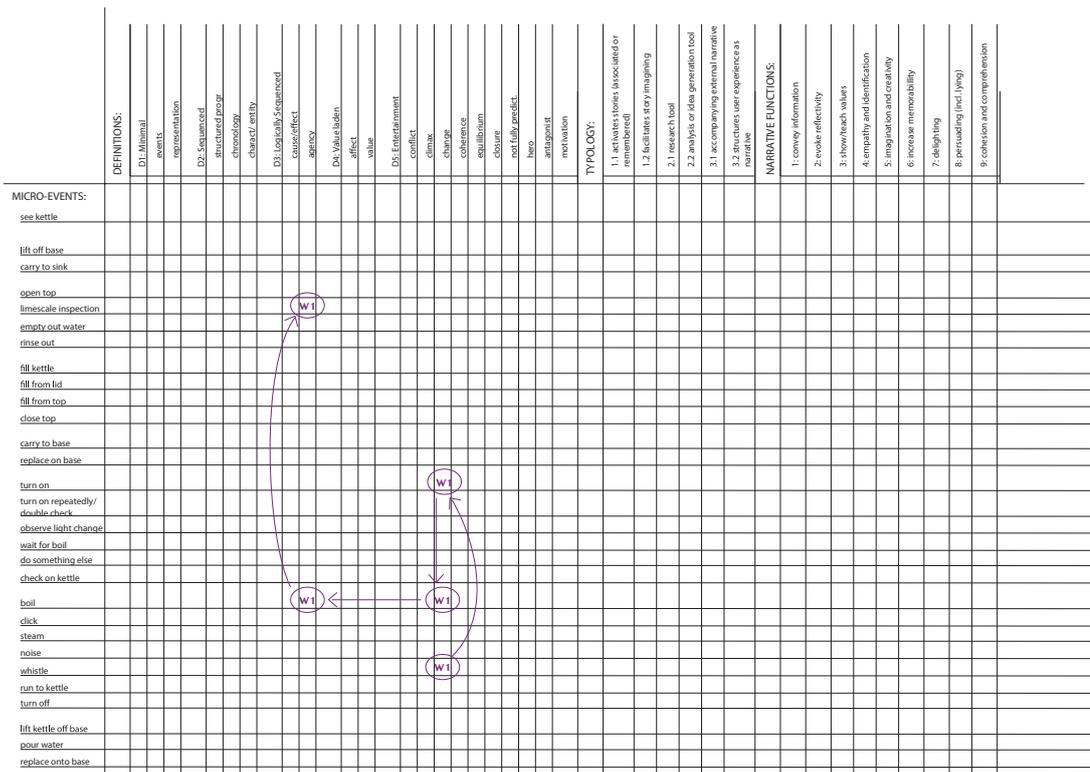
Figure 30 Movement of sketch concepts for "sudden switch between worlds". Author's own.

This method has proven, through the design practice, to be valuable as a way to generate a large number of design concepts quickly, which possess elements of tellability. In the examples above and the first set of sketch concepts, described in detail in the Case Study 1 (Section 4.1, p. 126), most of the movement of sketch concepts happens within the Narrative Definition levels, while this does not touch the Narrative Typology and Narrative Functions categories. This was addressed in a further iteration of the design process, described in detail in Case Study 2 (Section 4.3, p. 173). Another observation following Case Study 1 was that, though the sketch concepts that were selected to be prototyped contained a clear timeline or sequence of events, the method used to arrive at these concepts was not facilitating the designer's thinking in this direction. In Case Study 2 the design method was adapted to facilitate the consideration of the timing of the experience of use.

One of the aims of the study is to provide designers with a series of methods they can experiment with in the creation of designs that foster more narrative experiences. This is not to be seen in contrast with other design methods or focuses, nor is it to be seen in opposition to other ways of using narrative within the design process, such as scenarios for empathising with users (Blythe and Wright, 2006; Wright and McCarthy, 2008). It is instead intended to add a layer of understanding to the design of product experiences and to guide designers in the different ways in which they could use this additional layer. This method will be described in Chapters 4 (p.123).

3.3.5 Testing the Design Prototypes

The four prototypes designed in Case Study 1 and Case Study 2 were tested with new participants both in individual sessions and in group sessions. The individual sessions were carried out at the University of the Arts and participants were recruited through an Eventbrite invitation that was publicised on Twitter and Facebook using hashtags related to London and DIY and on groups that are interested in objects, such as Freecycle and local selling and swapping groups. In addition, physical leaflets were dropped in theatres, cultural venues and co-working spaces in proximity of the testing location. This resulted in a mixed group of participants, ranging in age from university students to advanced middle age, male and female, and with a variety of backgrounds and nationalities. Participants are referred to by their first names only throughout the study and private details have been handled in line with UAL's ethics guidance.

Before coming to the session participants were asked to email in or bring with them a picture of their kettle at home. Upon arrival and after completing the ethics procedures, participants were asked about their own kettle, to describe it and describe how they use it, with prompting questions about when they might use it, prompting for more detail in the process description, and asking about the selection of this particular model of kettle.

Participants were then asked to make tea with two kettle prototypes in each session, and were then interviewed while the tea and cake were consumed. The interviews were semi-structured, allowing the interviewees to follow trains of thought but also having prompting questions ready in case the conversation stalled or in case certain areas were not addressed. The conversation started by asking about using this particular kettle prototype, and asking for a description of the steps, with prompting questions if necessary. Participants were then asked to think of their own kettle and in what ways this experience differed from their normal kettle use. Some of the prompting questions related to memories or associations, and some were used to elicit more information when some interesting aspects were mentioned. The questions were repeated for each of the two kettle prototypes tested in each session, though in most cases the conversation flowed easily from one kettle prototype to the other and back and forth between their own kettles or kettles they owned in the past.

Group testing sessions were carried out as part of an Experience Design Elective with undergraduate students from across the Design School at London College of Communication. Students were taken in groups to a testing space, while the rest of the class worked on storyboarding their experience with using their own kettles (or implements they may use to boil water, as some did not use kettles). The group sessions were run in a similar way to the individual sessions but had an open conversation between the 4 to 8 participants in the group, and biscuits were served instead of cake. One person was asked to use the kettle prototypes and make tea for the whole group, and the others were made aware that they could pitch in to the conversation at any moment. The questions followed the same semi-structured format used for the individual sessions, though the conversation developed slightly differently because of the group dynamics.

All the interviews were audio recorded and transcribed, and the transcriptions formed the basis of the analysis. Table 4 details all the testing session, with related transcripts, showing the participants and which kettles were tested in which session.

AUDIO FILE NAME	FILE NAME	SESSION	DATE	PARTICIPANT (S)	KETTLES TESTED
chao-chi part 1.amr ; chao-chi part 2.amr	K0Chao-Chi	first session: Kettle 0 (own)	25-Mar-14	Chao-Chi	0 (own)
ines part 1.amr ; ines part 2.amr	K0Ines	first session: Kettle 0 (own)	25-Mar-14	Ines	0 (own)
vera part 1.amr ; vera part 2.amr	K0Vera	first session: Kettle 0 (own)	25-Mar-14	Vera	0 (own)
20 Sep 2016 11:23:12 am.amr	K1and2Giulia	testing session 1: kettles 1 and 2	20-Sep-16	Giulia	1 and 2
R09_0001.WAV	K1and2Gwen	testing session 1: kettles 1 and 2	20-Sep-16	Gwen	1 and 2
jules.WAV	K1and2Jules	testing session 1: kettles 1 and 2	20-Sep-16	Jules	1 and 2
R09_0002.WAV	K1and2Tim	testing session 1: kettles 1 and 2	20-Sep-16	Tim	1 and 2
cindy.mp3	K3and4Cindy	testing session 2: kettles 3 and 4	05-Oct-17	Cindy	3 and 4
lucy.mp3	K3and4Lucy	testing session 2: kettles 3 and 4	05-Oct-17	Lucy	3 and 4
Maya.wav	K3and4Maya	testing session 2: kettles 3 and 4	10-Nov-17	Maya	3 and 4
AVCHD 0000	K1and2-Gr1	experience-centred design students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
AVCHD 0001	K1and2-Gr2	experience-centred design students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
AVCHD 0002	K1and2-Gr3	experience-centred design students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
AVCHD 0003	K1and2-Gr4	experience-centred design students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
R09_0003.mp3	K3Gr1	experience-centred design students: Kettle 3	31-Jan-17	Students	3
R09_0006.mp3	K3Gr2	experience-centred design students: Kettle 3	31-Jan-17	Students	3
R09_0008.mp3	K3Gr3	experience-centred design students: Kettle 3	31-Jan-17	Students	3
R09_0009.mp3	K3Gr4	experience-centred design students: Kettle 3	31-Jan-17	Students	3
group1.mp3	K4Gr1	experience-centred design students: Kettle 4	24-Oct-17	Students	4
group2.mp3	K4Gr2	experience-centred design students: Kettle 4	24-Oct-17	Students	4

Table 4 Testing Sessions

There were a few differences between how the methodology was initially thought of and how it developed throughout the research. The initial plan was to test the final design with the original survey responders, and in fact to use the survey as a way to recruit participants. However, while the survey was carried out in 2011, the kettles were not tested until 2016 and 2017; this was deemed too long a gap to be able to

use the same participants who five years prior had indicated they would participate in future phases of the study.

In addition, initially the designed prototypes were intended to be tested using the same methods that were used to test the initial kettles to analyse the micro-events in the kettle interaction, as described in the Analysis of the Product Experience Section 3.3.3 above (Ko sessions). However, in practice this did not work. The designed prototypes were tested in a university environment, where the kettle prototypes were set up and the participants were asked to use these as part of the session, and then discuss this experience in detail and also talk about other kettles they have used in the past with the researcher in a semi-structured interview. When showing the film back to the participants, this did not add the same richness to the retelling of the product experience. This might be due to the fact that the initial participants who contributed to the Analysis of the Product Experience Ko sessions were talking about their experiences with a kettle which was not present in the room, and the experience was not fresh in their mind, while the participants who were testing the designed prototypes were reporting on the experience immediately after the fact and with the product in the same room. The film was therefore deemed unnecessary as it didn't add to the interview, so it was only used in the first few interviews.

The storyboarding exercise was adopted in the group sessions, as these were carried out with design students. However, the storyboarding exercise was deemed too intimidating for the individual sessions, for which participants were recruited from outside of the design world. The storyboarding exercise is also quite time consuming for the participant, taking at least half an hour, and this would have made the testing sessions longer than an hour, which was considered too long a commitment to ask of participants without remuneration. In addition, while the storyboarding exercise was valuable initially to analyse the microevents in the kettle interaction, because it forces participants to identify these discrete moments in the kettle experience, the storyboards did not add to the qualitative analysis of the interviews, and mostly presented the same information in a different format.

3.3.6 Analysis of the Interview Transcripts

When analysing the interview material, though film and photographs were collected together with the audio recordings, interview transcripts were selected for analysis

over other forms of data. Part of this choice was based on convenience, as the transcripts provide solid data to analyse and are less ambiguous and easier to handle than video evidence. The transcripts force the analysis to focus on the story of the product experience as it is retold by the participant, so this is a narrativised recounting of the product experience. In this way, the qualitative analysis would focus on the user's interpretation and retelling of the experience, which is the focus of this research, as opposed to an external observation of this experience, which implies behavioural models of analysis that are outside the remit of this research. As written text, transcripts are similar to traditional material for narrative analysis, the written text, and this allows the analysis to focus on word-based markers of narrativity in the speech.

The qualitative analysis was conducted in Atlas.ti by dividing the transcripts into quotes in a similar way in which a block of text would be divided into paragraphs, keeping as much as possible a stable topic of conversation throughout the quotes, and keeping the quotes a manageable size. Each quote was then coded in this order: Step 1 identified the session type (group, individual or first). Step 2 identified the conversation topic (K0 stands for own kettle, K1 through K4 are the 4 designed prototypes), and descriptions (either description of kettle, or description of use). In Step 3 the quotes were coded with narrative elements coming from the Practice Review (Chapter 1, p. 31) and Literature Review (Chapter 2, p. 51), in the form of Narrative Functions (NF), Typology Categories (T) and Keywords (K) and these are referred to as "markers of narrativity". The codes are shown in full in

Table 5. To note, Typology Categories 2.1 and 2.2 were not included in the coding because they describe narrative use within the design process, and are not directly related to the user's product experience.

CODES for data analysis of interviews					

Step 1	code	Step 2	code	Step 3	code
Session type	group	Conversation topic	K0 (own)	NF	NF1 - info
Session type	individual	Conversation topic	K1,2,3,4	NF	NF2 - reflection
Session type	first			NF	NF3 - values
		description	description of kettle	NF	NF4 - empathy
		description	description of use	NF	NF5 - creativity
				NF	NF6 - remember
				NF	NF7 - delight
				NF	NF8 - persuade
				NF	NF9 - cohesion
				T	T1.1 - activate associated stories
				T	T1.2 - facilitates story imagining
				T	T3.1 - accompanying external narrative
				T	T3.2 - structures experience over time
				K	Key-emotion
				K	Key-agency
				K	Key-identity
				K	Key-habit
				K	Key-anecdote
				K	Key-storyworld
				K	Key-memory

Table 5 Codes used in qualitative analysis.

This analysis made it possible to identify topics of conversation in relation to the range of kettles tested, and to compare the ways in which participants talked about each of the kettle prototypes as well as comparing the designed prototypes to how the participants talked about their own kettles or kettles they used in the past.

The codes picked up markers of narrativity in the speech related to the kettles. These markers were used to give a qualitative indication of the ways in which participants discussed the different kettles, but were not used to quantify instances of certain markers appearing. Data was not collected nor divided into quotes in such a way to make a quantitative analysis of narrative markers relevant, nor was it deemed possible to "measure" an increase or decrease in narrativity when comparing the kettles. However, the rich qualitative data deriving from the analysis of the speech gives interesting indications about the ways in which the participants have interpreted the kettle prototypes as well as the ways in which the prototypes have directed the users towards certain types of narrative interpretation and retelling. The results of the analysis will be discussed in the next two chapters,

Chapter 4 and Chapter 5, in relation to K1 and K2 in Case Study 1 (Section 4.1, p. 126) and K3 and K4 in Case Study 2 (Section 4.3, p.173).

3.3.7 Narratives in Design Toolkit: Testing and Analysis

This research identifies with the Design Studies tradition as described by Fallman (Fallman, 2008), with a central focus on using theories from other disciplines in order to generate new design knowledge that can be generalised and applied throughout different areas of design. Because of this, part of the concern of this research is disseminating resulting theory and design methods in a way that is engaging for the target audience of product designers and design students working within speculative design and design research. To this purpose, and to validate the Typology of Narrative Use (Section 1.2, p. 42) and Narrative Functions (Section 1.1, p. 35), as well as the Narrative Definitions described in Section 2.3 (p. 67), a Toolkit was designed, iterated and tested through a series of workshops with students across design universities and one group of lecturers.

In the first workshop (Workshop A) students used a fact sheet to identify narrative elements coming from the Narrative Definitions, the Narrative Functions and the Typology of Narrative. This was applied to analyse examples that the students brought to the workshop because they thought they were narrative design, and then to redesign projects they had been working on, keeping in mind the narrative effects of the design. The next three workshops (workshops B-D) tested a first version of the cards based on the three frameworks, but which broke down the categories into a simpler system, based on Who, What, Where, When and Why. The last four workshops (Workshops E-H) tested the final version of the cards at different levels and with different audiences. At the end of each workshop feedback was collected formally or informally, and the feedback helped to design further iterations of the toolkit and of the workshop itself. The details of the workshops are shown in Table 6 below.

	Tested with	Date	Participants	Version of the toolkit & workshop
A	**MA Narrative Environments**, Central Saint Martins, University of the Arts London	5 Feb 2014	21 students	fact sheet, intro lecture, analytic and generative uses, participants brought examples, feedback collected.
B	**MDes Service Design Innovation**, London College of Communication, University of the Arts London	23 May 2014	8 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected.
C	**MA Graphic Design**, London College of Communication, University of the Arts London	11 June 2014	9 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected
D	MA Information Experience Design, Royal College of Art	29 May 2014	6 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected
E	**Design Fiction Course**, running across design degrees, Kolding School of Design, Denmark	20 Nov 2014	9 students	final card version, intro lecture, generative use, informal feedback only
F	**Learning and Teaching Day 2015**, University of the Arts London	14 Jan 2015	about 30 lecturers	final card version, intro lecture, analytic use only, examples provided, informal feedback only
G	**Foundation Diploma in Art and Design**, Central Saint Martins, University of the Arts London.	26 Feb 2015	about 20 students	final card version, not facilitated by the author, analytic and generative uses, participants brought examples, informal feedback only
H	**MA Service Experience Design and Innovation**, London College of Communication, University of the Arts London	19 Oct 2016	13 students	final card version, analytic and generative uses, participants brought examples, feedback collected

Table 6 Narratives in Design Toolkit Student Workshops

The toolkit was tested as both an analytical tool and a generative tool. This is because the frameworks of Narrative Definitions, Narrative Functions and Typologies of Narrative were devised initially as a way to analyse existing design examples, and were later applied through this research as a way to generate design concepts. While the generative aspects of the toolkit are more aligned with the aims of this research, it is easier to explain the categories in an analytical setting. Once workshop participants have fully understood the toolkit and the categories through an analytical approach, they can then apply the toolkit in a generative way to the redesign of the examples.

Participants were chosen across a range of design disciplines, to check how the toolkit could apply across different areas of design. Initially the toolkit was tested only with postgraduate students, because they would be more interested in the

theoretical aspects and in the development of frameworks. However, after Workshop F, lecturers at different levels of design education fed back that there might be applications for this at different levels of design education. Workshop G, with Foundation 3D design students, was organised in response to this, and the tutor who ran this workshop still uses the toolkit regularly with Foundation students.

The workshops were documented through photographing the ways in which the toolkit was used and collecting the outcomes of the redesign. Some case study examples are described in Chapter 4 (Section 4.2.3, p.160). Feedback was collected in writing for workshops A to E and H, and informally in workshops F and G. In addition, feedback from the course tutors was collected following the workshops, and instances of students mentioning the toolkit in the work they subsequently handed in or in their blogs were monitored. All this data was analysed through a qualitative analysis using inductive methods, grouping the existing data into categories to determine how the toolkit affected participant's thinking and design processes. This analysis is described in Section 4.2.5 (p. 171).

3.4 Insights and Conclusions to the Methodology

Narrative Theory has not been applied in this way to Product Design in the past, so the research methodology was designed from scratch and adapted as the research progressed. Two areas in particular went through many changes from initial conception of the research to the final methodology and process, and each of these areas provides a contribution to the knowledge:

- **The methods for incorporating narrative elements into the design practice, with the focus on the narrativity of the designed product.** This includes the methods that are codified into the Narratives in Design Toolkit, as well as the description of the design process in this research, applying elements from films to product design. These methods will be described in more detail in Chapters 4 and 5.
- **Methods for collecting and qualitatively analysing test data to build a picture of the narrativity of the product experience.** These were formulated throughout the process of the research with a lot of back and forth and false starts because a viable template for narrative analysis of

test data for products was not in existence. These methods will be disseminated within the design research community for other designers to adopt.

The methods for qualitative analysis of the test data took a great deal of discussion with supervisors as well as informal conversations with other researchers. Some of the other possibilities that were considered were to analyse the narratives according to the Narrative Definitions outlined in the Literature Review (Section 2.3, p. 67), assuming the narrative levels could be used to judge how close to a typical entertainment narrative these stories are. However, this method proved limited because an entertainment narrative may not always be the most desirable type of narrative. Another possibility considered was to compare the amount of time that the participants took to tell the interviewer the story of the interaction, but this method also assumes that a longer story is more engaging, and it is negated in a semi-structured interview format. Focussing the analysis on markers of narrativity, identified through the Literature and Practice Reviews both through framework categories and through keywords, created a method that could easily compare the qualitative aspects of the stories told in the interviews.

The designs deriving from this study will be situated within the context of speculative or research design work. This is outside of major commercial brands and outside of the constraints of mass production (Auger, 2013; Dunne, 2013; Malpass, 2013). However, this does not mean that the design methods deriving from this study would not be applicable and valuable within different design contexts. Gaining an understanding of the ways in which designers can make their products more tellable is valuable to product designers within a wide range of contexts, because tellability is connected with memory of the experience, recall and word-of-mouth. Ways in which these findings could be applied to other design fields will be discussed in more detail in Chapter 7 (p. 258).

Chapter 4 – Design Process, Methods and Outcomes

This chapter illustrates the process and the methods used to design four kettle prototypes, each one responding to a film in which the kettle features in a prominent role. Following models of action research and reflective practice, commonly used in design practice research, the design process was used as a way to test how elements from narrative theory could be incorporated into the designed products, and what value these could bring to designers. Those elements that were incorporated are based on the Practice Review in Chapter 1, in particular focussing on the Narrative Functions (Section 1.1, p. 35), and Typology of Narrative Use (Section 1.2, p. 42), as well as being based on the Literature Review in Chapter 2, in particular focussing on the Narrative Definitions (Section 2.3, p. 67). In order to keep in mind the single-use product experience of the kettle, the breakdown of the kettle experience into micro-events, described in Section 3.3.3 (p. 102), was used in conjunction with the narrative elements to generate sketch concepts that were then adapted and combined into the kettle prototypes.

Initially, two kettle prototypes, Kettle 1 (K1) and Kettle 2 (K2) were designed for Case Study 1. Then the design methods were codified into a toolkit, the Narratives in Design Toolkit, which was tested with design students across several universities. Following this, and upon reflection on the design process in Case Study 1, the Toolkit was revised and then used to design two more kettle prototypes, Kettle 3 (K3) and Kettle 4 (K4), described in Case Study 2. The kettles were then tested with participants and that testing was qualitatively analysed to assess which markers of narrativity are present in the interviews. The testing and qualitative analysis of the kettles is described in Chapter 5 (p. 195).

The methods were codified into a Toolkit in order to be more accessible and easy to communicate to designers and design students. Undergraduate product design students, and in some ways students and designers across different levels and design disciplines, have a tendency to be very good at articulating what their design is for, in a problem/solution type of design framework, but are not usually as adept at articulating what their design is about (Dorst, 2003). This makes it harder to design for product experience, as addressing what a product does is not enough to understand how that product would be interpreted and used over time by a person, how people may relate to that product, or how they may relate to other people

through the product. Looking at what a product is about opens up the thinking and enables the designer to address the ways in which a user may interpret specific details of the design as well as overall features. This is something that is taught in design schools through feedback and critiques about design, however introducing narrative as a key concept in the design process can be a valuable way to encourage students to envision how users may interpret their product and give them a framework to understand how the experience of a product may unfold over time. In Nicholas and Aurisicchio's terms, it can allow students to move beyond technical functions of a product and to concentrate on aesthetic and social functions of the product they are designing (Nicolas and Aurisicchio, 2011).

Narratives have been extensively used in design in the last decade (Steffen, 2009; McCarthy and Wright, 2010). However, there is a lack of unified language around the terms, which can lead to misunderstandings in terms of what is considered to be narrative within a design or within the design process, the presentation of the product or the user experience. Delving into the narratology literature, the picture becomes even more complex. Different fields study narrative from different perspectives and for different purposes, and each field has its own way of defining what narrative is. Some of the disciplines that contribute to the literature on narrative are literary studies and film studies, as well as history, psychology, philosophy and sociology (Meuter, 2016). It is therefore difficult for designers to get a clear understanding of this broad field with differing perspectives, and this creates a barrier to a clear application of theory to the analysis of design work and the integration of this understanding into the design process.

In addition to the different disciplines which study narrative, within literary narratology there are different approaches focusing on particular aspects of the narrative. The traditional approach to narratology is structuralist, and this approach is interested in describing the elements that constitute a narrative and how these are structured, focusing on the way the story unfolds over the time of the storytelling, and the way in which events are told. Post-structuralist approaches and more modern approaches to narrative theory focus on different aspects: contextualist narratology focuses on the historical, social and ideological context of the narrative, trans-medial narratology looks at non-literary narrative mediums, and cognitive narratology focuses more on the effects that narrative has on humans and on cognition (Meister, 2016).

Cognitive narratology in particular provides a bridge into design with an experiential focus. Experiences, with or without products, happen over time. Narrative is the way in which we as humans organise our understanding of time-based events, and how we retell these experiences (Bruner, 1991; Forlizzi, 1997; Dewey, 2005; Hassenzahl, 2010). In addition, the field of narrative theory has been opening up to wider interpretations of what constitutes a narrative that go beyond the literary text. For example, Abbott acknowledges that everyday events can be described and analysed as narratives, Bal uses narrative theory to analyse the interpretation of fine art, and Young and Saver describe the role of narrative in the formation of a life narrative and personal identity (Young and Saver, 2001; Bal, 2002; Abbott, 2008). These interpretations can include on-the-spot interpretation of an experience or retelling or remembering that experience as narratives (see Section 2.4 on Narrative Interpretation, p.73, and Section 2.5 on Narrativity and Tellability as Product Qualities, p. 79).

However, the idea that narrative is a part of the user experience and part of the mechanism for the interpretation of products is often overlooked within a design context, while the potential is there to use this area of knowledge to help direct the way an experience unfolds over time, and how it is interpreted, understood, remembered and retold by the user (Grimaldi, Fokkinga and Ocnarescu, 2013; Grimaldi, 2015). The Narratives in Design Toolkit aims to provide a language for designers to talk about narratives within design work, and make it easier for designers to address elements of narrative theory within the design process.

The Narratives in Design Toolkit section of the chapter is adapted from a sole authored paper entitled 'Narratives in Design Toolkit', submitted to the Experience Design Journal – story track. This was submitted on invitation from the editor for the first issue of the journal, peer reviewed and accepted for open source publication (forthcoming, Autumn 2018).

4.1 Case Study 1 – Design Process of Kettle 1 (K1) and Kettle 2 (K2)

4.1.1 Film Analysis and Design Briefs

The first step in the design process was to select films in which the object appeared in a significant role. For the kettle, the four films selected were *Vera Drake* (Leigh, 2004); *Wristcutters: A Love Story* (Dukic, 2007); *A Tale of Two Sisters* (Kim, 2003); and *Secretary* (Shainberg, 2002) a comedy/drama/romance in which the kettle is used to establish a domestic calm scene but in that same scene is then used as a self-harm tool. For Case Study 1, two kettles were designed and prototyped, one taking as a starting point the film *Secretary*, and one originating from the film *A Tale of Two Sisters*.

The interactions with kettles in the films were analysed using a method based on McKee's book *Story*, the analysis of the film scenes looked for beats, turning points, conflicts and goals as well as looking more holistically at the role or agency of the kettle within the scene (McKee, 1999).

The kettle in *Secretary* performs a very strong role reversal. The scene starts off as a calm domestic setting in which the protagonist, who we know is a self-harmer and has just finished treatment for her condition, is making herself a cup of tea. As the water starts boiling, her parents get into a violent fight in the other room. This is the catalyst for the protagonist to take the kettle upstairs and burn herself with it. The act of burning herself makes her feel calmer after having witnessed the violent fight. After this kettle scene and throughout the rest of the film, the protagonist meets an older man who is her boss and together they enter into a BDSM relationship; as the relationship develops, the protagonist stops self-harming. In a sense her new lover replaces the kettle of that initial scene as a source of harm.

126

Title: Secretary
Scene: 7.02 to 8.22 min
Object: kettle

Year: 2002
Genre: comedy, drama, romance
Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10   10   10   5   5   15   25

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved

Title: Secretary
Scene: 7.02 to 8.22 min
Object: kettle

Year: 2002
Genre: comedy, drama, romance
Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10   10   10   5   5   15   25

value: sanity - charge

character's emotional charge

viewer's empathy - story charge

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved

role of the object:
metaphorical: represents domesticity, calm, normalcy

role of the object:
catalyst for action: it's an available weapon, ready to be used

Title: Secretary
Scene: 7.02 to 8.22 min
Object: kettle

Year: 2002
Genre: comedy, drama, romance
Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

Conflict: to keep some semblance of normalcy within situation
Objective: keep sane - not hurt herself

Who: protagonist
Antagonist: father's alcoholism

Context of film: protagonist is a self harmer who just left a mental hospital. She returns into the same domestic problems: alcoholic father, the rest of the family is in denial

Possible briefs from this film:

- 10|10|10|5|5|15|25 as an organisational principle for micro-events within a single interaction (timing structure)
- alternation of value charges - with or without the timing - within a single interaction (value structure)
- change of the role of the object: from metaphorical to catalyst for action
- change of the role of the object from one of calming and domestic to a weapon for self harm
- role reversals in general

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

Figure 31 - Analysis of Secretary. Author's own. (Larger version in Appendix 10).

128

From the film analysis, several briefs were written based on the kettle's role in the kettle scene, the timing and beats of this scene, as well as what the kettle represents within the context of the full film:

Brief 1 (S1) Masochist's kettle – this is a kettle that performs the role that the *Secretary* kettle takes on at the end of the kettle scene, that of weapon to purposely hurt oneself with.

Brief 2 (S2) Kettle that represents calm domestic comfort – this is a kettle that performs the role that the *Secretary* kettle performs at the beginning of the kettle scene, to establish a calm domestic and comforting scenario.

Brief 3 (S3) Kettle that performs a role change, from calm to weapon – this is looking at S1 and S2 in combination, and focussing on the change of role that the kettle performs throughout the duration of this kettle scene, from establishing a calm setting to being a weapon ready to be used.

Brief 4 (S4) Following the timing of the kettle scene – this is looking specifically at the structure, timing and beats of the scene, which start off with longer beats, climax with a series of short and shocking beats, and then tapers off with longer beats again, and trying to match this rhythm in the way the micro-events are organised throughout the kettle interaction experience.

The way these briefs are developed into prototypes is explained in the Design Process section below.

The mood of the film *Tale of Two Sisters* is very dark; it is not clear what is reality and what isn't, and there are a series of ghost-like apparitions. The protagonist is a young girl, and in this scene, she finds in her house a bloody bag that appears to contain a body; she thinks it is the body of her sister. She tries to open it and goes to the kitchen to find a knife as the kettle on the stove starts to whistle. This prompts a series of quick cuts to the girl's stepmother, to flashbacks, and back to the whistling kettle. The sack is not where the protagonist left it; when she finds it the kettle whistles again and her stepmother appears with the freshly boiled kettle and tries to burn her with the water. The protagonist fends her off with scissors.

Protagonist follows a trail of blood through the house

Finds a bloody sack, tries to open it but can't

rummages in drawer

kettle whistles

stepmother

kettle again

flashbacks

sack's not there - she follows trail of blood

stepmother

She finds sack in closet

kettle whistles

stepmother wipes hands

stepmother carries kettle

she cuts sack

confrontation with kettle

kettle thrown - stabs with scissors

fight

end on floor

120 50 10 10 5 5 30 25 5 30 5 10 10 5 15 15 10 10

Title: Tale of Two Sisters

Scene: 1.18 to 1.24

Object: kettle

Year: 2003

Genre: drama, horror, mystery

Source: IMDB forum

Notes: none

120　50　10　5　10　5　30　25　5　30　5　10　10　15　5　15　10　10

value: sanity - charge

value: urgent fear (character's)

viewer's understanding of story

Protagonist follows a trail of blood through the house

Finds a bloody sack, tries to open it but can't

rummages in drawer

kettle whistles

stepmother

kettle again

flashbacks

sack's not there - she follows trail of blood

stepmother

She finds sack in closet

kettle whistles

stepmother wipes hands

stepmother carries kettle

she cuts sack

confrontation with kettle

kettle thrown - stabs with scissors

fight

end on floor

role of the object:

catalyst for action: it's an available weapon, ready to be used | metaphorical: out of place in setting; whistle for danger, madness

Title: Tale of Two Sisters

Scene: 1.18 to 1.24

Object: kettle

Year: 2003

Genre: drama, horror, mystery

Source: IMDB forum

Notes: none

Conflict: to understand what is going on | protect her sister

Objective: save her sister | regain sanity

Who: protagonist

Antagonist: stepmother

Context of film: protagonist leaves a mental hopital after the death of her mother to return to a house that is haunted and a strange/evil stepmother.

Possible briefs from this film:

- fast pace, quick cuts (timing structure).
- alternation of value charges - with or without the timing - within a single interaction (value structure).
- not quite understanding what is going on but getting glimpses.
- object that appears out of place also acts out of place.
- the whistle as related to/causing madness or visions.

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

Figure 32 Analysis of Tale of Two Sisters. Author's own. (Larger version in Appendix 10).

The *Tale of Two Sisters* briefs were written keeping in mind the role that the sound of the whistling kettle performs, being a premonition for something bad to come, the fact that sound of the kettle prompts a quickening of the scene, and the relationship between the characters and the kettle in the scene:

Brief 1 (TTS1) Kettle with ghost-like agency – this brief took into consideration the sound of the kettle as a disruptive moment as well as the fact that the kettle is not fully predictable in its behaviour, mimicking the behaviour of the stepmother in the film, who uses the kettle to try to burn the protagonist.

Brief 2 (TTS2) Kettle that is crazy – this brief is related to the previous one, but focuses more on the unpredictable aspects of the kettle's behaviour.

Brief 3 (TTS3) Kettle that drives the user crazy –this brief is related to the previous two, TTS1 and TTS2, however in this brief the kettle is less of an agency in itself and more of a catalyst for the user's agency.

The way these briefs are developed into prototypes is explained in the Design Process section below.

4.1.2 Design Process, K1 and K2

The design process takes an intentionally analytical approach to idea generation and concept development, making explicit some of the design decisions and steps in the design process that designers often perform in an instinctive way. The aim is to make this study applicable for other designers by replicating the design methods, and also in part to help non-designers and design students demystify the act of designing and generating ideas. It also helps to make explicit the links between the theoretical aspects of the research and the design process of the related prototypes, as well as creating a record to help analyse this process and feed into the theoretical analysis.

The idea generation is aided and visualised by using a matrix (Figure 24, p.108). The micro-events in a single interaction with a kettle, deriving from the ethnographic analysis described in Section 3.3.3 (p. 102), are charted on the left-hand column in the matrix, including quirks of use and uncommon interactions. The top row of the matrix is populated with the Narrative Definitions (Section 2.3, p. 67), the Typology of Narrative Use in Design (Section 1.2, p. 42) and the

Narrative Functions (Section 1.1, p. 35). The Narrative Definitions are additionally broken down into their defining elements to make these more explicit.

Each brief is then brainstormed to devise a series of concepts and these are plotted onto the matrix according to what micro-event in the kettle interaction the design addresses and which narrative elements are used. The matrix is used in two ways: firstly, it is used as a way to quickly analyse the sketch concepts. So, each sketch concept is placed on the matrix to see in what way it addressed the micro-events as well as the narrative qualities. Secondly, the matrix is used as a prompt for generating sketch concepts, by combining the specific brief with a micro-event that it would focus on as well as a narrative element. For example, after an initial sketch concept is generated in relation to the brief, the designer consciously considered what would happen to that brief if the brief were acting on a different micro-event in the interaction, or if it were responding to a different narrative element. In this way, the matrix became a generative tool as well as a way to represent the thought process, and this proved particularly valuable in moments of "designer's block" in which the matrix helped the idea generation process move at a quick pace. This provides the basis for a number of variations on the same concept acting on different narrative principles or on different micro-events within the user experience.

4.1.3 K1 - Secretary Kettle

Figure 33 Sequence of Sketch Concepts S2. Author's own.

One of the briefs that derived from the film Secretary was about the kettle as a representation of calm, domesticity and comfort (S2). The sequence of sketch concepts is pictured in Figure 33. Brainstorming and idea generation started from the concept of a kettle that is covered in a furry sleeve, as a hot water bottle would be (S2A). The next sketch concept was moving to the idea of a character, so the furry sleeve turns into a man's jumper, as it humanises the kettle but also makes it identify with the main male character in the film as a source of comfort (S2B). The next sketch concept comes from the same idea of the men's jumper and the

character, but rethinks what part of the kettle interaction is affected, so which micro-event is changed by the design: for this the jumper acquired usable pockets that can be used to warm your hands while waiting for the water to boil (S2C). The next iteration looks at maintaining the idea of the pockets/hand-warmers but losing the jumper as a symbol, so the metal kettle has two openings on the side that are furry inside and hand-sized, moving the design away from character and back to affect as a narrative element (S2D). The final sketch concept in this series keeps the micro-event as the waiting for the kettle to boil, but moves the narrative element to "not fully predictable", resulting in a kettle that has slots in the sides that are hand-sized but not fluffy, if you use them you will eventually get burned (S2E). Figure 34 shows how the concepts for the film *Secretary* moved around the matrix. This method allows for a wide range of quickly generated variations on a brief, but also for combining these variations within more complex interactions. It also encourages the designer to keep in mind and focus on the narrative effects of the design, and the elements that make up the time-based experience.
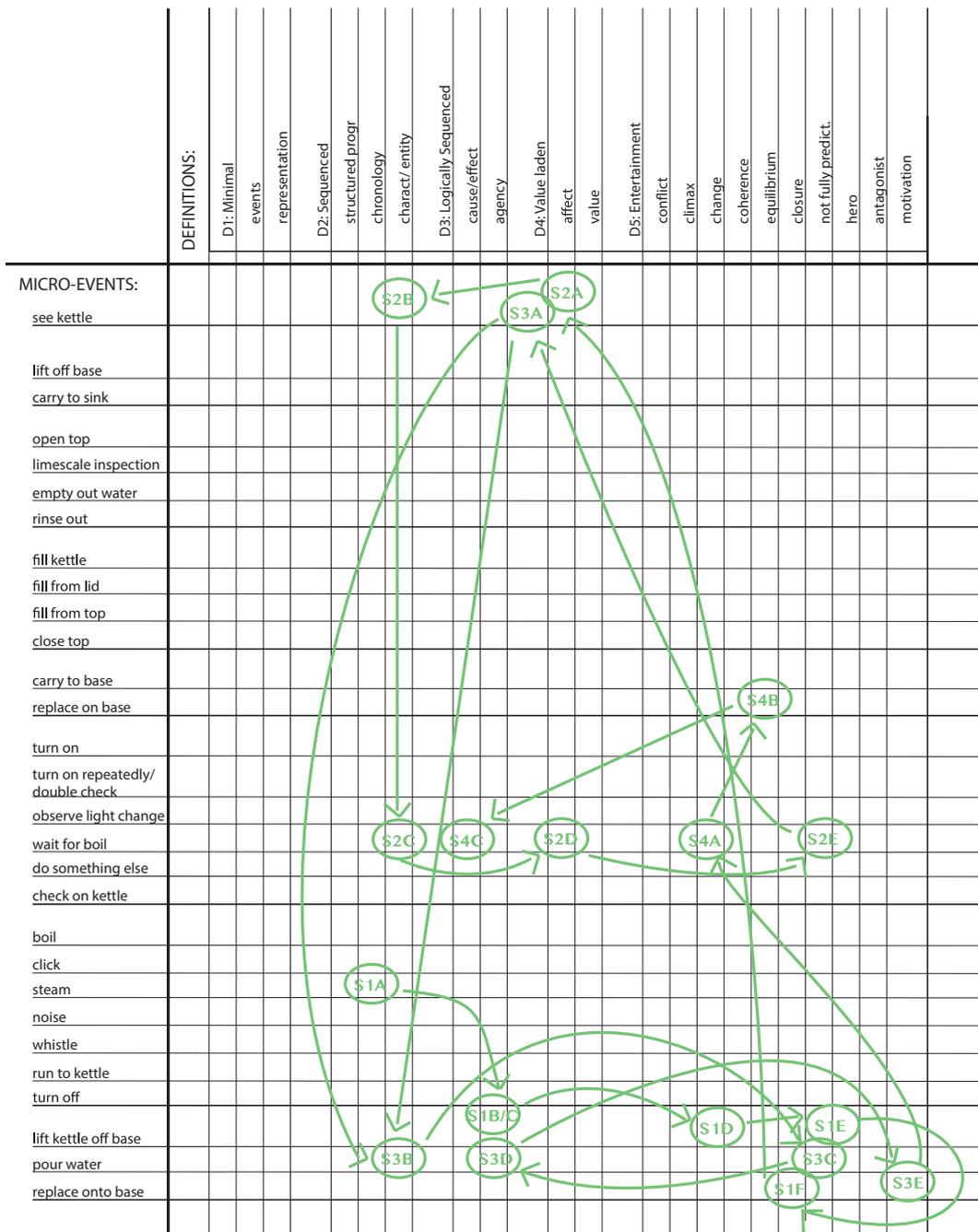
Figure 34 Matrix plots of Sketch Concepts for Secretary. Author's own.

Looking at brief S2, the kettle as a representation of calm, domesticity and comfort, the sketch concepts in S2B and S2C, of a kettle with a male jumper with or without pockets resonated with me as a designer and with my interpretation of the film *Secretary*. I started exploring how this concept could be realised in practice. I experimented with creating a cosy for the kettle out of a man's cardigan, though this became too literal an interpretation, and would be unpractical as a permanent feature of a kettle. I looked at other materials that could be regularly exposed to

heat as well as water and could be permanently covering the kettle, and I experimented with knitting different grades of neoprene and sponge cord in order to create a sleeve that could permanently live on the kettle. These however were too bulky and didn't give the right feel. Finally, the idea of having a pattern that would represent a male knit jumper without it being too literal was explored through different styles of representation, settling on a hand-drawn knit pattern as being relatively abstract but understandable as a knit, as well as having a handcrafted feel to it, similar to a hand-knit.

Figure 35 experiments with different knit materials and patterns. Author's own.

Some of the initial ideas generated within the S2 briefs were then combined with elements from brief S4, which looked at mimicking the timing structures of the kettle scene in the film Secretary, and having something that happens over the time span of the kettle boiling that would make a fundamental change to how we perceive the kettle. Thermochromic ink was an obvious way of applying the pattern to the kettle, as it reacts to temperature, so would change throughout the use of the kettle. The question was then whether the pattern would be on the kettle when cold,

and would then turn to a solid colour when boiling, or if the pattern should be revealed at the point of boiling. Initially it seemed obvious to have the kettle as a source of comfort, so with the pattern, and then have it change when the kettle turns into a potential weapon, for example turning to red to signal this change. However, revisiting the film scene, the protagonist takes comfort from burning herself with the kettle. She stops self-harming at the end of the film by entering into a BSDM relationship with an older man, so the source of that comfort, as well as the source of harm, is transferred onto the partner. Taking this into consideration the kettle was designed to be less homely and comforting initially, so it is all black when it is cold, and then as the kettle gets hotter the knit pattern is revealed, reinforcing the comfort through its appearance but also contrasting with the fact that the kettle is dangerous when hot. There are other parallel meanings that are also revealed: making a tea or coffee is usually a ritual that provides comfort, and the knit pattern appears when the water is almost ready to use, and stays on the kettle for five to ten minutes after, depending on how much hot water is left in the kettle, so the pattern remains for most of the time that tea is being drunk.

Designing the exact form of the kettle was less important than designing the interaction with the kettle, so a kettle that would embody the characteristics of the character represented was sourced and was then modified for this prototype. The kettle was selected to be slightly old fashioned, with a traditional "kettle" shape and also not too rounded or friendly looking, to encapsulate the fact that the kettle changes to something comforting over the time of the interaction. This process is shown in the Taxonomy charts in Appendix 15.

Figure 36 K1 - Kettle based on the film Secretary. Author's own.

The time-based aspect of the kettle is documented through a film in Appendix 21, and the full design process is in Appendix 15. The final prototype was tested with users and the resulting interviews analysed for markers of narrativity; the analysis will be described in Section 5.2 (p. 204) and Section 5.3 (p. 209).

4.1.4 K2 – A Tale of Two Sisters Kettle

One of the briefs deriving from A Tale of Two Sisters was the Kettle with a ghost-like agency. The first sketch concept was a kettle that would rattle when the water boils (TTS1A), which would be looking at the boiling as a micro-event and at behaviour that is not fully predictable as a narrative device. The next sketch concept was looking at the whistle pitch, and having this change the emotions and affect associated to the boiling water (TTS1B). I then concentrated on the idea of agency and the next sketch concept is a kettle that hovers over the stove (or appears to be hovering) like a ghost (TTS1C), quickly followed by a kettle that would gradually hover as the water gets hotter, which would take it more in the realm of a character or entity controlling the kettle (TTS1D). Figure 37 shows the series of sketches for this brief and Figure 38 shows how these moved around the matrix as part of the idea generation process.
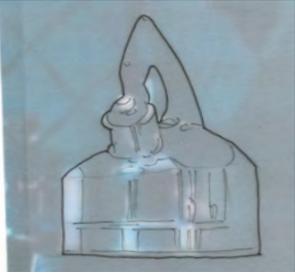
TTS1A

ball-bearings rattle w/ strange sound when water boils

"rattle my teaaaaa"
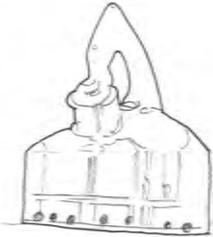
TTS1B

experiments with the whistle pitch.
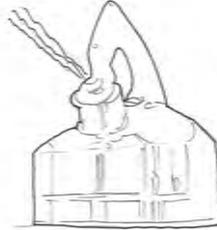
TTS1C

hovering (or appears to be hovering)
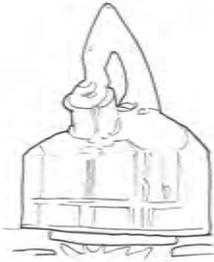
TTS1D

kettle hovers as water boils →
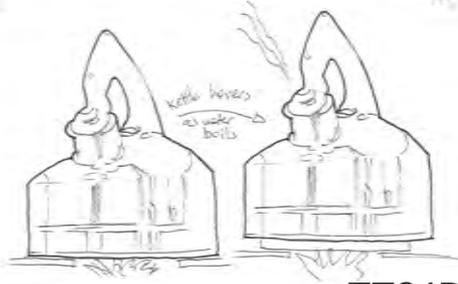
Figure 37 Sequence of sketch concepts for brief TTS1, deriving from the film A Tale of Two Sisters, and focusing on the kettle with a ghost-like agency. Author's own.

Figure 38 Matrix plot of the idea generation process for A Tale of Two Sisters Kettle. Author's own.

Though the selected concept was essentially the first to be sketched for this brief, the kettle that rattles when boiled TTS1A, the final design and prototype incorporates some of the elements from the other concepts explored, looking at the way in which the sound can change the emotions associated to the kettle as well as incorporating the idea of a progressive build-up of something during the arc of the time necessary to boil.

Again, designing the actual form of the kettle was less important than designing the interaction with the kettle, so a suitably ghost-like kettle was sourced, one that is stovetop, has a rounded, traditional and somewhat dainty appearance and is made of a single material. The surface of the kettle was originally chromed, but this was

changed to a matte brushed finish to enhance the ghost-like qualities. To achieve the rattle, I experimented with different materials inside the kettle. The initial idea of ball bearings gave not a shred of sound, nor did any other materials that I tested. Back to the drawing board I found glass disks that are manufactured to use when boiling milk; they rattle alerting you that the milk is close to the boil, so you can turn it off and prevent it from boiling over. One of these disks did not create a loud enough effect, but two were loud enough to be noticeable.

The final design is a stovetop kettle with slightly traditional, dainty appearance in brushed aluminium. As the kettle boils it starts popping and rattling, just slightly at first and then progressively more and more frequently and more loudly. Once the water boils the rattle is loud and constant. After the kettle is turned off it starts settling down, the rattling and popping slows down and becomes more infrequent until it settles down completely and is quiet.

Figure 39 A Tale of Two Sisters Kettle. Illustration of its behaviour. Author's own.

The time-based aspect of the kettle is documented through a film in Appendix 21, and the full design process is in Appendix 15. The final prototype was tested with users and the resulting interviews analysed for markers of narrativity; the analysis will be described in Section 5.2 (p. 204) and Section 5.3 (p. 209).

4.1.5 Reflections on the Design Process

Using the film as a source for the design proved valuable because it provided plenty of material to play with, in terms of conceptual associations, metaphors and visual

language. It made it possible to think in an abstract way in terms of character and storyline, and make decisions that might appear counterintuitive at first but are coherent with the symbols being incorporated into the design. This sense of coherence is easy to maintain when using narratives as source material, (see Narrative Function 9,

In design process

	Where and When	
NF1 Communicating and Conveying Information	Designers and researchers use narratives to communicate insights more clearly and effectively, for instance in persona stories, context stories, or stories about current product use. Examples: *Cyrrus Technologies* (Lloyd, 2000); *Fictional Inquiry* (Dindler and Iversen, 2007)	Narratives can be used to communicate to users about how they can use their products, for instance in usage scenarios. Example: *Do Design* (Taylor, 2013)
NF2 Evoking Reflectivity	User or product narratives that involve an unusual situation or some kind of conflict can be used by designers to highlight design problems or cultural issues. Examples: *Design Fiction* (Ypma and Wiedmer, 2010)	In critical design, narratives are used to prompt users to reflect on the role of products and technology in their lives. Examples: Gamper, *100 Chairs in 100 Days (in Malpass, 2013)*; *Design Noir (example: Nipple Chair)* (Dunne and Raby, 2001); *Philosophical Toys* (Hayward, 2013)
NF3 Showing and teaching values	Narratives can be used in the design process to show certain do's and don'ts of user-product interaction, for instance in horror stories of past products. Example: *Cyrrus Technologies* (Lloyd, 2000)	Narratives, such as those used by movements like cradle-to-cradle or modernism, can be used to convey the ideological purposes of the products they set forth. Also in critical and speculative design the main purpose can be to show society's values. Example: Auger's Smell +: Dating and Genetic Compatibility Smell Blind Date *(in Malpass, 2013).*
NF4 Empathy, Identification and Bypassing Social Structures	User or persona narratives are often used to achieve a greater empathy with real users than could be obtained with target group data. Examples: Blythe & McCarthy's Technology Biography, Gaver's Cultural Probes and Blythe's Pastiche Scenarios (all in McCarthy and Wright, 2010); Narrative Inquiry (Danko, 2006); Fictional Inquiry (Dindler and Iversen, 2007).	Personal narratives that a user attaches to an object, for instance its history, or who they received it from, can greatly increase the perceived value of the object. Example: The Comfort of Things (Miller, 2008).
NF5 Imagination and Creativity	Narratives can be used by designers to spark imagination and increase creativity. Examples: Cultural Probes (Gaver, Beaver and Benford, 2003)3); Design as Storytelling (Parrish, 2006).	Product narratives can inspire users to new ways of using the products, or even new ways of fitting the products in their lives. Example: Significant Objects, (Glenn and Walker, 2012).
NF6 Memorability	User insights that take the form of a narrative are easier to remember than facts or bullet points. Example: Invisible Design (Briggs et al., 2012).	Narratives attached to or created through a product increase the memorability of product experience, and increase word of mouth. Examples: *Ta-Da Series* (Grimaldi, 2008); Brand narratives (Steffen, 2009); Narratives in user experience (Forlizzi and Ford, 2000).
NF7 Engaging and Delighting	Narratives that don't just inform but also delight, increase the chance to be used frequently and effectively by the design team. Examples: Invisible Design (Briggs et al., 2012); Fictional Inquiry (Dindler and Iversen, 2007).	Narratives, either as part of a product or external to it, can enrich the user experience. Examples: Ta-Da Series, in particular the On-Edge Lamp (Grimaldi, 2008); Anna G corkscrew by Alessi (Markussen, Ozcan and Cila, 2012)2).
NF8 Persuading	Narratives about particular groups of users can help persuade design teams or funding bodies about the necessity of a particular design approach. Example: Inclusive Design (Moore, 2011).	Narratives created through branding and advertisements persuade users that one product is superior to another
NF9 Cohesion and Comprehension	Narratives can be used to test how different elements within a complex design or system work together. Example: *Design as Storytelling* (Parrish, 2006)	Narratives can help make complex user experiences more coherent and help the user see the connections between different parts of the experience. Example: *Freya's Cabin* by Studio Weave (Ahn and Smith, 2011).

, p. 36). However, this method didn't help to plot events along the timespan of a single interaction, so most of the sketch concepts in Case Study 1 act upon a single micro-event, for example they are activated when the kettle starts to boil, or they are seen at first sight. The final concepts that were prototyped tended to combine these sketch concepts to create more complex experiences, however this was not reflected in the design methods used, as the Matrix only encouraged reflection upon one micro-event at a time. This was addressed in Case Study 2, described in Section 4.3 (p. 173).

Formalising and describing the design methods in detail illustrates different ways to facilitate the consideration of narrative qualities in the idea-generation process. This was shown through the process of designing the first two kettles, as the analysis of the films led to several briefs, and the narrative matrix method facilitated a quick idea generation process and a way of analysing and combining different design concepts, according to the ways in which they are narrative as well as accounting for the whole of the time-based interaction experience.

Looking at the matrix plots after Case Study 1, it was clear that I was only using the Narrative Definitions as prompts for designing, and not engaging with the rest of the narrative elements listed in the top row of the matrix (Figure 24, p. 108, full size version in Appendix 12). This prompted reflection about the fact that the Narrative Definitions and the Typology and Narrative Functions were not categories that were exclusive to each other, with the Narrative Definitions providing a sense of scale, while the Typology and Narrative Functions provided a sense of the effect of the narrative on the user. A sketch concept could fall within certain Definition categories, and also certain categories in the Typology and others in the Functions. It therefore did not make sense that the Narrative Definitions, Typology and Narrative Functions should be listed on the same row, as this encourages the designer to use them as either/or categories. This required a redesign of the matrix, or a different way to use these elements in a more flexible way and in different combinations. It also pointed to the fact that the Narrative Definitions were guiding my design process more than the other elements in the top row, so these could be used in a key manner in further iterations of the method.

The Matrix was also not a user-friendly tool. I used it in my own design process and it allowed me to keep certain elements in mind; however, it was too complex to explain to people quickly and wasn't visually engaging enough. This reflection prompted the development of the Narratives in Design Toolkit which was tested as

an alternative way in which to communicate the narrative elements as well as the design process. This toolkit is described in two versions, the first was designed iteratively through a series of student workshops (described in Section 4.2 Narratives in Design Toolkit – version 1, below) and the second version incorporates some of the variations in response to the reflection on Case Study 1 design methods (described in Section 4.4 Narratives in Design Toolkit – version 2, p. 191).

4.2 Narratives in Design Toolkit – version 1

The Narratives in Design Toolkit was developed to test how the knowledge generated throughout this research could be generalised for application by other designers across design disciplines. Part of the drive for this was to find a way to synthesise the concepts generated through the literature and practice reviews into a simple application that could be easily understood and used by others. The process of designing the toolkit went through many iterations, which were tested with design students and then reworked, to see how the framework of Narrative Definitions, Narrative Typology and Narrative Functions, outlined in Chapter 1 and 2, could be communicated to designers and to design students. After the first workshop, some form of cards was identified as an engaging and simple way to communicate these concepts, that would resonate with designers and allow for flexibility of application within a universal set of tools. This was developed as a follow up on the paper *Narratives in Design* (Grimaldi, Fokkinga and Ocnarescu, 2013) and the testing and printing of the toolkit was funded through the London College of Communication Research Project Fund.

The Narratives in Design Toolkit draws on the frameworks built through the Practice Review and Literature Review and simplifies this approach into basic elements. The toolkit helps designers articulate narratives in the design, in terms of definitions of narrative and the elements that compose it (based on the Narrative Definitions framework, as described in Section 2.3, p. 67); it helps designers identify ways in which narrative is used in design (based on the framework Typology of Narrative Use in Design, described in Section 1.2, p. 42); and it helps designers describe what narrative does, in terms of the effects it has on the design process or the user experience (Narrative Functions in Design, described in Section 1.1, p. 35).

Narrative Definitions (Section 2.3, p. 67) reviews different definitions of "minimum narrative" based on what elements are necessary for something to be considered narrative by a series of prominent narratologists. This is summarised into five Narrative Definitions for designers to use and refer to *what* level of narrative is present.

Typology of Narrative Use in Design (Section 1.2, p. 42), addresses the idea that some ways of using narrative within design are well established and common, while others are overlooked. This makes it hard to talk about narrative as it is assumed that the conversation is revolving around one of the more established ways of using narrative as opposed to other less commonly used methods. To address this, different uses are classified into a Typology of Narrative Use in Design, according to *who* is the creator and audience of the narrative, and *when* and *where* the narrative is present or used.

Finally, Narrative Functions in Design (Section 1.1, p. 35) describes *why* narrative is used in design, and to what effect: what Narrative Functions it provides. It is almost inevitable that for example some projects will fall within different categories in terms of Narrative Function, as well as different clusters in the Typology of Use. It is also inevitable that the narratives related to a project are multiple and overlapping and to a certain extent these are subjective and based on the user's interpretation. However, this does not mean that the designer cannot specify particular intentions, and this classification allows designers to reflect on the intended role of narrative within their design work.

Following reflection on the design process in Case Study 1, it became clear that the Matrix was not a method that could be disseminated easily to other designers, as well as presenting other methodological problems as described above in the section Reflections on the Design Process (Section 4.1.5, p. 142). The Narratives in Design Toolkit was designed through an iterative process with postgraduate design students participating in workshops, to enable conversations about narrative to take place within design contexts, and to create a synthesis of the theoretical research into a format with more universal appeal. It provides a framework and a language for discussing the narrative aspects of product designs, as well as design work from other disciplines. At the basis of this is the concept that all design is narrative in some ways; following this premise, the question becomes in what ways the design is narrative, and how can a designer design to purposefully incorporate more

narrativity and have more control of the narrative elements of the design (Grimaldi, 2015).

A toolkit that could bring the theories and classifications explored into a form that is more universally usable seemed necessary as a means of communicating this research. The original classification is very complex and requires a lengthy introduction and presentation in order to engage with designers or design students. This research aims to open up the conversations about narrative and make these relevant to designers and design students to apply within their own practice. Therefore, a simpler representation of this classification was needed that did not require in-depth knowledge of narrative concepts but that would engage designers and foster conversations and reflections on narrative in design. In addition, the original classifications referred primarily to product design, while it was recognised through feedback at the conference presentation of the paper Narratives in Design (Grimaldi, Fokkinga and Ocnarescu, 2013) and feedback to the paper itself, that this approach may be valuable across different design disciplines.

The Narratives in Design Toolkit was designed to address these issues, by presenting a tool to aid easy and instinctive reflection upon how narrative is used in design. This can be used as an analytical tool as well as within generative phases of the design process. The Toolkit is presented in the form of a deck of cards to be used in sequence, and printed on glossy card; the cards can be marked with dry-erase marker and then rubbed off so the kit can be reused. Each card has a front and a back: the front is for participants to circle definitions, while the back provides instructions. The graphic design and typography of the cards was commissioned to Kat Henderson. Approaching it in sequence, the first card contains a very brief introduction to the project and to how to use the cards. The second card asks the user to describe the narrative at play in their design. This is an important step as it forces the user to think of what narrative or narratives are in the design and which narratives to focus on for this exercise. It also encourages participants to discuss this with a peer, and the workshops themselves were structured to allow for group work and group conversations. The third card asks about details of the project (designer, project, year) and details of the workshop and participant.

Most of the participants' reflection happens in cards four to eight, which are colour coded and present the headlines *Who*, *When*, *Where*, *Why*, and *What*. On the back of the cards are the full questions such as "*Who creates the narrative and who is the audience of this narrative?*" Participants have the opportunity to answer the

questions by circling one or more of the definitions on the front of the cards, or indeed add a different answer. Participants were also encouraged to circle more than one definition per card if they thought that more than one applied, but were then asked to prioritise a main answer, which most were able to do. The final card asks for participant feedback on the workshop.

	FRONT	BACK
INSTRUCTIONS	Narratives in Design a toolkit to analyse the use of narrative in design, and to help define the use of narrative in the design process. Mark your answers on each card as you go through them.	These cards are designed to help you assess the way narrative is used in existing design examples, as well as help guide your use of narrative during the design process. To redesign or reposition existing work, change the answer on one or more of the cards, and redesign accordingly. To create new work, answer the questions on the card as part of the idea generation process, keeping an open mind in terms of repositioning design work.
DESCRIBE the narrative	....	Please describe in your own terms the narrative(s) present within this design example. You might find it easier to discuss this with someone before writing it down.
DETAILS	Designer: .... Project: .... Year: .... Where & when was this filled out?	Your name .... (leave blank if you wish to remain anonymous) Your email address .... (leave blank if you don't want to receive updates on the project)
WHO	CREATOR → AUDIENCE User → User User → Designer Designer → Designer Designer → User	Who creates the narrative and who is the audience of this narrative? Designers may create narratives for users, but they may also create narratives for the design team. In the same way, users may be creating the narrative for themselves or other users, or for the design team.
WHEN	In the design process In the user experience	When is narrative present? Is the narrative used within the design process, for example as a research tool or as an idea generation tool, or is it designed into the user experience of the object, for example through associated stories or trajectories through space?
WHERE	Internal to the object External to the object	Is the narrative internal to the object or external to the object? An internal narrative is understood by looking at or using the object without requiring additional information. An external narrative is understood only after referring to additional information not contained in the object itself. For example the user may need to read something, view an accompanying video, or hear an explanation.
WHY	Communication & Conveying Information Evoking Reflectivity Showing & Teaching Values Empathy, Identification & Bypassing Social Structures Imagination & Creativity Memorability Engaging & Delighting Persuading Cohesion & Comprehension	Why is narrative used, to what effect? In this card we are interested in what the narrative does, within the context of the design, as opposed to what effects the design itself has. For example, an object might delight because of its physical appearance but not through a narrative.
WHAT	Minimal Narrative Sequenced Narrative Logically Sequenced Narrative Value-Laden Narrative Entertainment Narrative	What type of narrative is present? Minimal Narrative: a representation of one or more events. Sequenced Narrative: a representation of one or more characters or entities in a series of chronological events. Logically Sequenced Narrative: Sequenced Narrative where chronological events are connected by causality or agency. Value-Laden Narrative: an emotion-evoking and value-laden Logically Sequenced Narrative. Entertainment Narrative: a Value-Laden Narrative, which progresses through conflicts toward a climax.
FEEDBACK	....	For more information about the Narratives in Design workshops: narrativesindesign.wordpress.com or email Silvia Grimaldi on s.grimaldi@lcc.arts.ac.uk

Table 7 Narratives in Design Toolkit, content of the cards.

The toolkit evolved through a series of workshops with students and teaching staff at a number of Universities. In the first workshop (Workshop A) postgraduate students were asked to bring examples of designs they found to be narrative, and were given an introduction lecture outlining the Definitions, Typology and Functions. The participants were then supplied with a fact sheet to help identify which of the Definitions, Types and Functions fit their examples. From facilitating the workshop, it became evident that the participants still found this very complex, and it required explaining the Typology many times.

	Tested with	Date	Participants	Version of the toolkit & workshop
A	**MA Narrative Environments**, Central Saint Martins, University of the Arts London	5 Feb 2014	21 students	fact sheet, intro lecture, analytic and generative uses, participants brought examples, feedback collected.
B	**MDes Service Design Innovation**, London College of Communication, University of the Arts London	23 May 2014	8 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected.
C	**MA Graphic Design**, London College of Communication, University of the Arts London	11 June 2014	9 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected
D	MA Information Experience Design, Royal College of Art	29 May 2014	6 students	first card version, intro lecture, analytic and generative uses, participants brought examples, feedback collected
E	Design Fiction Course, running across design degrees, Kolding School of Design, Denmark	20 Nov 2014	9 students	final card version, intro lecture, generative use, informal feedback only
F	**Learning and Teaching Day 2015**, University of the Arts London	14 Jan 2015	about 30 lecturers	final card version, intro lecture, analytic use only, examples provided, informal feedback only
G	**Foundation Diploma in Art and Design**, Central Saint Martins, University of the Arts London.	26 Feb 2015	about 20 students	final card version, not facilitated by the author, analytic and generative uses, participants brought examples, informal feedback only
H	**MA Service Experience Design and Innovation**, London College of Communication, University of the Arts London	19 Oct 2016	13 students	final card version, analytic and generative uses, participants brought examples, feedback collected

Table 8 Workshops run with the Narratives in Design Toolkit.

The second version broke down the Typology into discreet parts, which combined together would provide the different Types. In this second version, the idea of using the 5 W's, Who What Where When Why, was first tested. The Definitions mapped against *What*, the Functions mapped against *Why*, and the Typology mapped against a combination of *Who, Where, When*. The second version was used in Workshops B, C and D, following an introductory lecture. Participants were asked

to bring examples of projects they found narrative; they analysed these, and then modified them using the toolkit as a generative tool.

From observation and from the feedback, participants found this second version straightforward to use. The prompting words were more self-explanatory, as participants asked fewer questions to clarify how to use it. In addition, the back of the cards included further instructions and definitions as a reminder of what was covered in the introduction. This version is similar to the final version but provided the opportunity to enter an "other" in each of the cards. This was discarded in the final version, as only one participant in all the workshops used this possibility, pointing to the idea that the given definitions were exhaustive enough.

The final toolkit was tested in workshops E, F, G and H. In this last round of testing the Toolkit was used in different ways. In workshop E it was integrated as a tool to reflect upon and improve a design fiction project that the participants were already working on; in workshop F it was presented to a group of lecturers as part of a learning and teaching day, so examples were given by the facilitator and the participants only carried out an analysis of the examples given; Workshop G was facilitated by one of the participants in workshop F, who thought the Toolkit would work well with Foundation students, and in this workshop there was no initial lecture; Workshop H was run as part of a project on research methods, and again there was no initial lecture, and the participants used the toolkit to analyse examples of services they provided, and to kick-start the design phase of a service design project they were already involved in, by envisioning potential narratives as their outcomes.

Figure 40 Narratives in Design Toolkit card set front. Author's own.

Figure 41 Narratives in Design Toolkit card set back. Author's own.

4.2.1 Use as an Analytical Tool – first part of the workshop

Depending on the workshop, participants were either supplied with a series of examples to analyse or were asked to bring with them examples from their own practice and/or from other designers' work. In workshops A- D the room was set up with a large grid on the wall to create a chart, similar to the matrix described in Chapter 3, for pinning up the analysed work. Along the top of the chart were the Narrative Functions (*why*), and across the left side of the chart were the Typology

expressed as categories in workshops A and B, and as combinations of *who*, *when*, and *where* in workshops C and D. The chart was produced to give an idea to the participants of how the work they analysed and generated mapped against the classifications in the paper Narratives in Design; this however became less relevant in later workshops so it wasn't created for workshops E-H. Workshops A-F started with a presentation of the framework with discussion of several examples, while workshops G-H had a more general introduction to the Toolkit without a formal presentation.

In all workshops participants were divided into small groups of two to four people and asked to discuss one example at a time from those provided by the author or supplied by the participants. This created lively discussion within the groups. They were then asked to go through the toolkit as a group and use all the cards in sequence for each of the designs they discussed, omitting the feedback card at this point. In workshops in which a wall chart was used the filled-out cards were attached to the image or the project and participants were then asked to pin up the image and cards to the chart on the wall, in correspondence with the main Narrative Function of the design as well as the main Typology category of use. In those workshops in which participants brought examples, and especially when the examples they brought were specifically from their own design practice, this provided an occasion for participants to reflect upon how as a group they had similarities or differences in terms of the ways in which they used narrative.
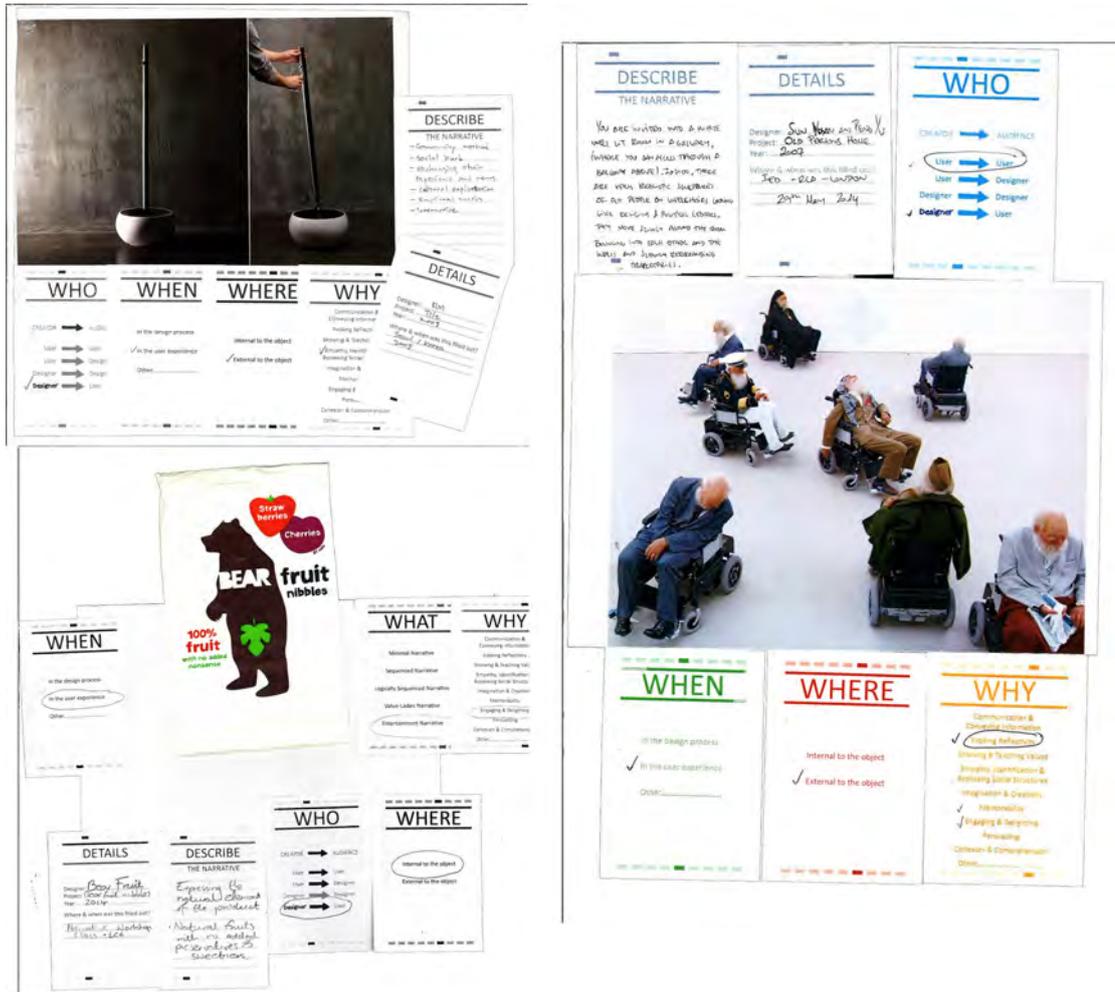
Figure 42 Examples of filled out toolkits. Participant work.

Figure 43 Examples of the table on the wall from different workshops. Author's own.

From the point of view of the facilitators of this workshop (the author in most cases except for workshop G), the analytical use of the toolkit provided the basis for lively and focussed debate about the examples shown. There were some healthy disagreements in some groups, resulting in circling more than one answer. Picking a main answer out of those, as opposed to picking the only answer, facilitated the resolution of these disagreements. Overall the conversations were very much on point and the level of concentration was high throughout. One of the common points for conversation focussed on the fact that the designs presented had multiple and multi-layered narratives, with disagreements around which of these narratives should be the focus of the exercise. The facilitator explained that the narratives will always be multi-layered (Grimaldi, Fokkinga and Ocnarescu, 2013), and a similar analysis could be carried out for each of the multiple narratives or each of the layers, however for time restrictions they should focus on what it perceives to be the main narrative.

Another common point for conversation focussed around the observation that all design is narrative in some way, and the conversation was guided by the facilitators towards identifying in what particular ways narratives are used in these examples, differently from the way in which all design has narrative qualities.

From the point of view of the participants, this was overwhelmingly seen as a clear way to analyse concepts which they had trouble articulating before and the vast majority of the anonymous feedback collected after the workshop pointed to the fact that this level of analysis added something to their understanding of the design examples as well as their understanding of the use of narrative within design.

From a researcher point of view, the toolkit acted as a prompt or link to the denser research, enabling deeper thoughts about narrative in the designers that participated in the workshop, without having to be familiar with the narrative theories that underpin the toolkit.

Figure 44 Photos of workshops B and C. Author's own.

4.2.2 Use as a Generative Tool – second part of the workshop

Following the analysis of the design examples, participants were asked to change the design work taking as a starting point what narrative they wanted to achieve. This was done in different ways to cater to the specific group. When examples were given, participants were asked to randomly assign different categories to somebody else's design, and then the group had to redesign this to make it conform more to the randomly assigned categories. When examples were provided by the participants, and especially when some of the examples were from the participants' own design work or work in progress, participants were asked to reflect on what they would like the narrative in their project to do, or where they would like to focus more on narrative; they were then asked to redesign their project accordingly.
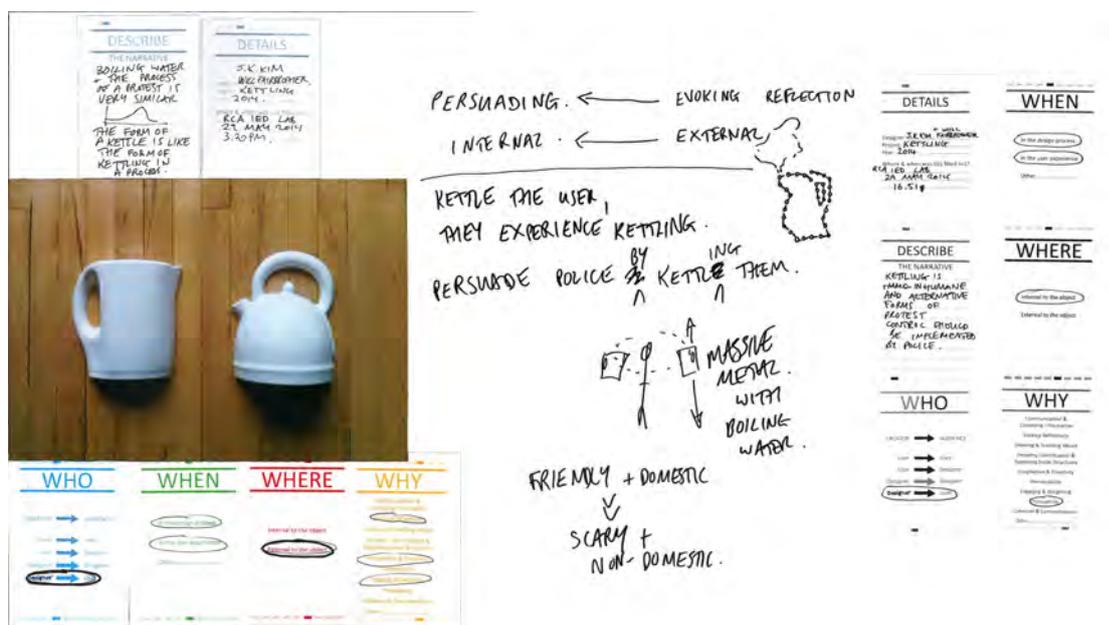
Figure 45 Redesigned options. Participant work.
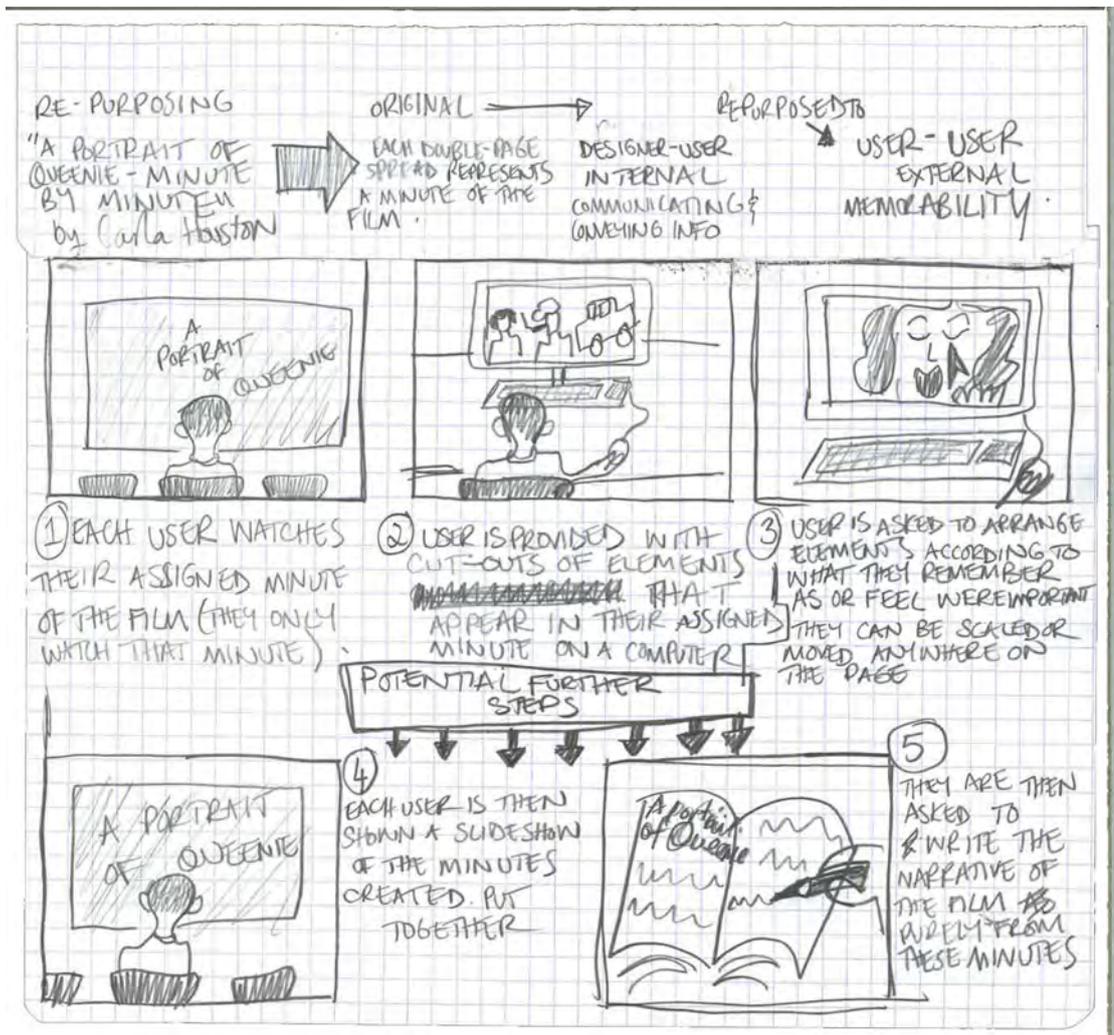
Figure 46 Redesigned options. Participant work.

This second part of the workshop was also positively received, though some participants found it more confusing and would have liked more time. All participants were able to generate at least one concept variation on the original design based on the new analysis, and again this generated lively discussion in the groups. The focus of these discussions was both in terms of assessing why you would want to design for a particular narrative function or in a particular typology of use, and also in terms of what changes could be made to the design or to the design process to make the project fall within the new categories. Participants reported that it allowed them to think of their current project in broader terms and focus on the effect their design work has on the user. It also provided a quick way to refocus and experiment with the design.

In particular, when used in a generative manner participants were able to envision the narrative effects of a redesign or of a different design outcome, before they had generated the design itself. This allowed for different ways of interpreting the project brief and was found to carry particular value in more complex problems. Workshop H in particular was designed to help participants advance their current service design project through using the Toolkit in a generative way. The focus on narrative encouraged participants to envision positive outcomes for their project from the point of view of particular users and stakeholders, and this led to several participants reporting that they had breakthroughs in their thinking about the project and now were able to envision potential outcomes after being stuck on the direction of the project.

4.2.3 Case studies

To show how the toolkit works in practice three case studies are presented that show an example analysed in the first phase of the workshop and then redesigned in the generative phase.
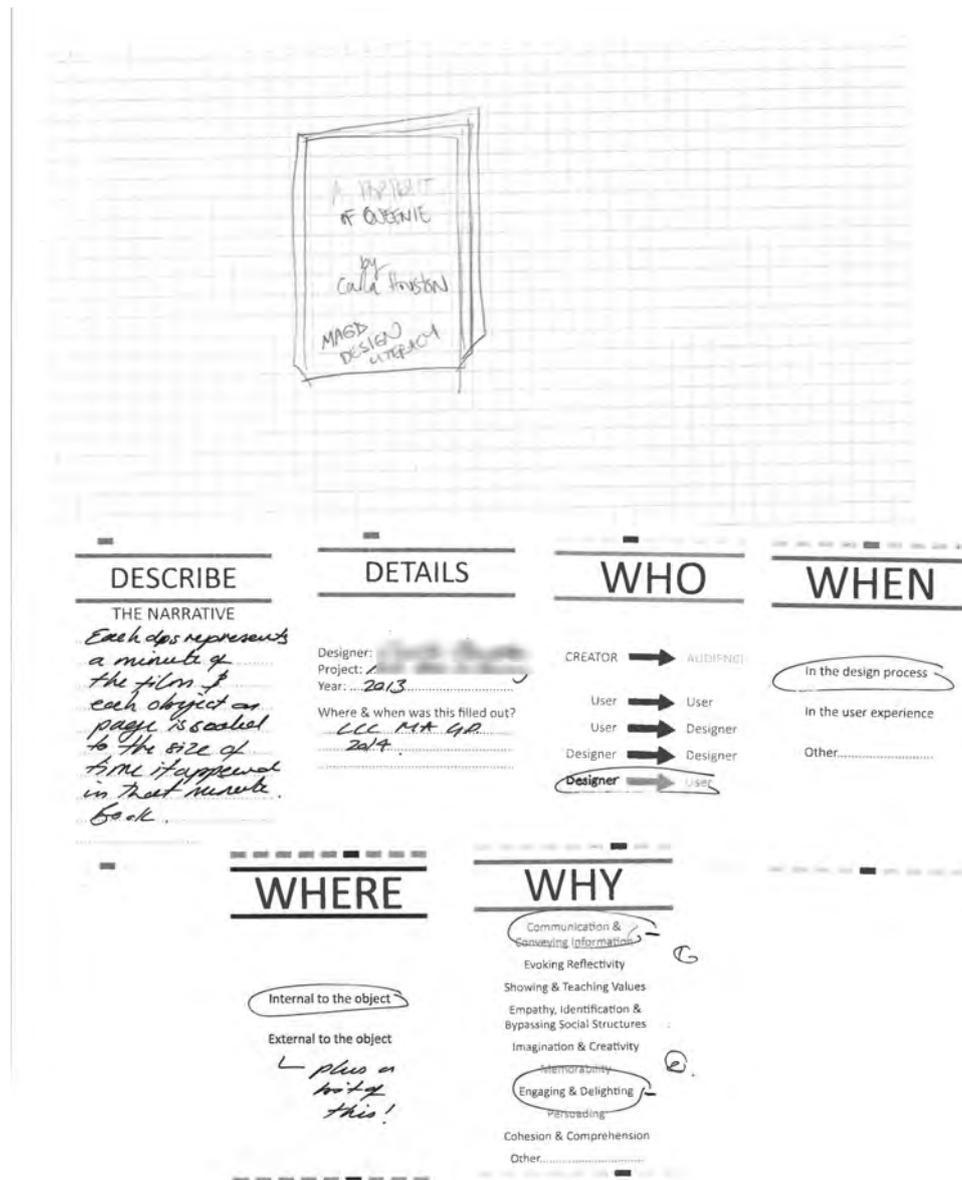
Figure 47 A Portrait of Queenie – analysis. Participant work.

This was an example from the participant's own work which she brought to the workshop because she wasn't fully satisfied with its outcome. The original design was an interpretation of the film *A Portrait of Queenie* in the form of a book of photographs, with each photograph representing a minute in the film. Through analysing the design the participant realised that she wanted to refocus the way in which the project communicated to the audience, and make it more interactive and memorable for a user. The initial book was assessed as being designer →user in the *Who* category, so the participant decided to brainstorm a user → user resolution that would allow the user more control over the creation of the project's narrative.

This switch came about through the participant questioning the authorship of the book's narrative and engaging with the question of who creates the narrative and who it is for. She had not engaged with questions of authorship before this workshop, but framing this in narrative terms helped her to take this perspective.

In addition, she thought the initial book was communicating and engaging the user in terms of narrative (*Why)*. However, the participant thought the redesign should make the narrative in the project more memorable to the user as a primary function. This was something that the participant was able to express in these terms because the Toolkit provided the vocabulary for this, while previously she had not engaged with or questioned what the effect of this narrative would be on a user, nor had she thought of using narrative for other purposes beyond communicating and delighting. Note that this participant was a Graphic Design student, so she had naturally engaged with communicating and delighting in her initial project.
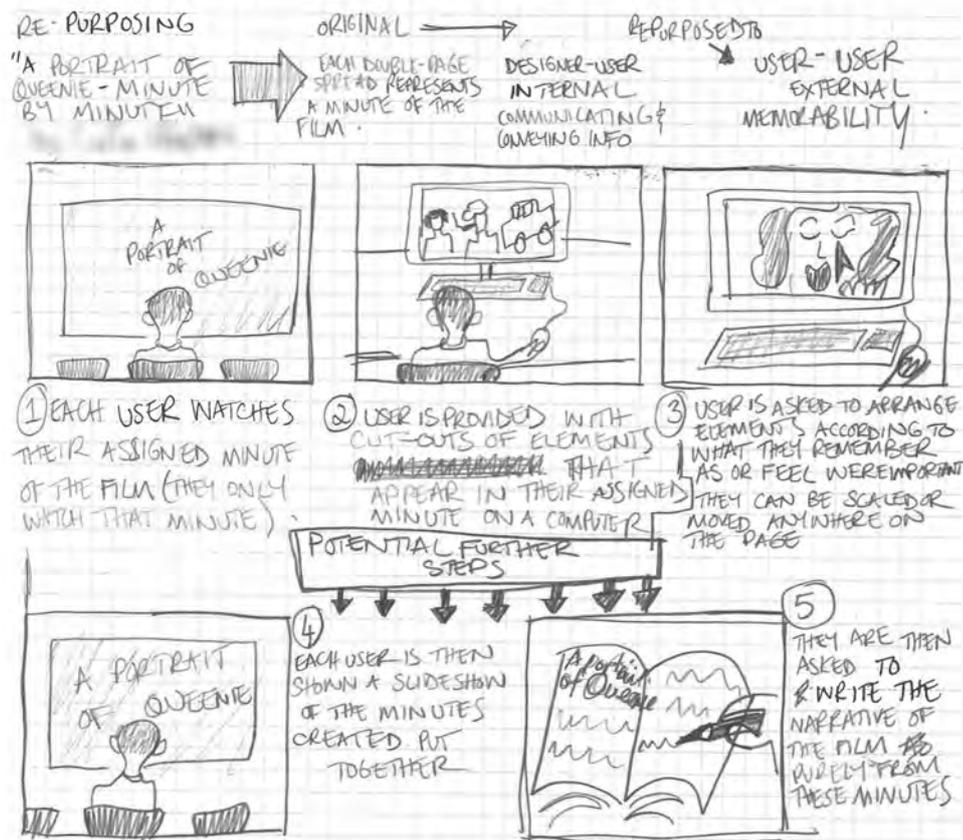
Figure 48 A Portrait of Queenie – redesign. Participant work.

The redesigned project addresses the authorship question (*Who)* by engaging the user in a summary of a single minute in the film. Subsequent users would create visual summaries of single minutes and these would then be shown in sequence as an interpretation of the film. The participant wanted the *Why* to address making this narrative more memorable, and did this in the redesign by engaging the user with their own memory of the minute of film and pulling out the memorable moments from it. The participant also proposed potential further steps that would engage the user even more in the creation of the narrative around the project.

Collage


Figure 49 Collage analysis. Participant work.

Figure 50 Collage – redesign. Participant work.

This participant brought a collage project featuring homoerotic imagery and our societal perceptions of this imagery. He assessed this initial work as having a narrative created by the designer for the user (who), the narrative is in the design process (when) and external to the final collage (where) and the aim is to evoke reflectivity and persuade (why). When looking at how to continue this project in a different direction, the participant decided that he wanted the authorship to be partially transferred to the user (who: user→ designer) so that it would involve participants in the design process (when) and the aim of this redesign should be to create empathy and identification in the designer (why). As a consequence, the participant designed an interactive bench that asks users to photograph parts of their body they feel insecure about, and this would inform the design process.

Using the toolkit was a starting point for the participant to think what he wanted the aim of the project to be. The focus is changed to empathy and the participant made a link between involving the user in the design process through quite personal questions, and designing a project that displays more empathy. The redesigned artefact is not pictured or described, however the participant thought of the ways in

which he could use narratives within the design process to then arrive at a different outcome. In this way, the final narrative of the redesigned artefact is co-authored by the designer and the users involved in the initial design phase.

Kettling
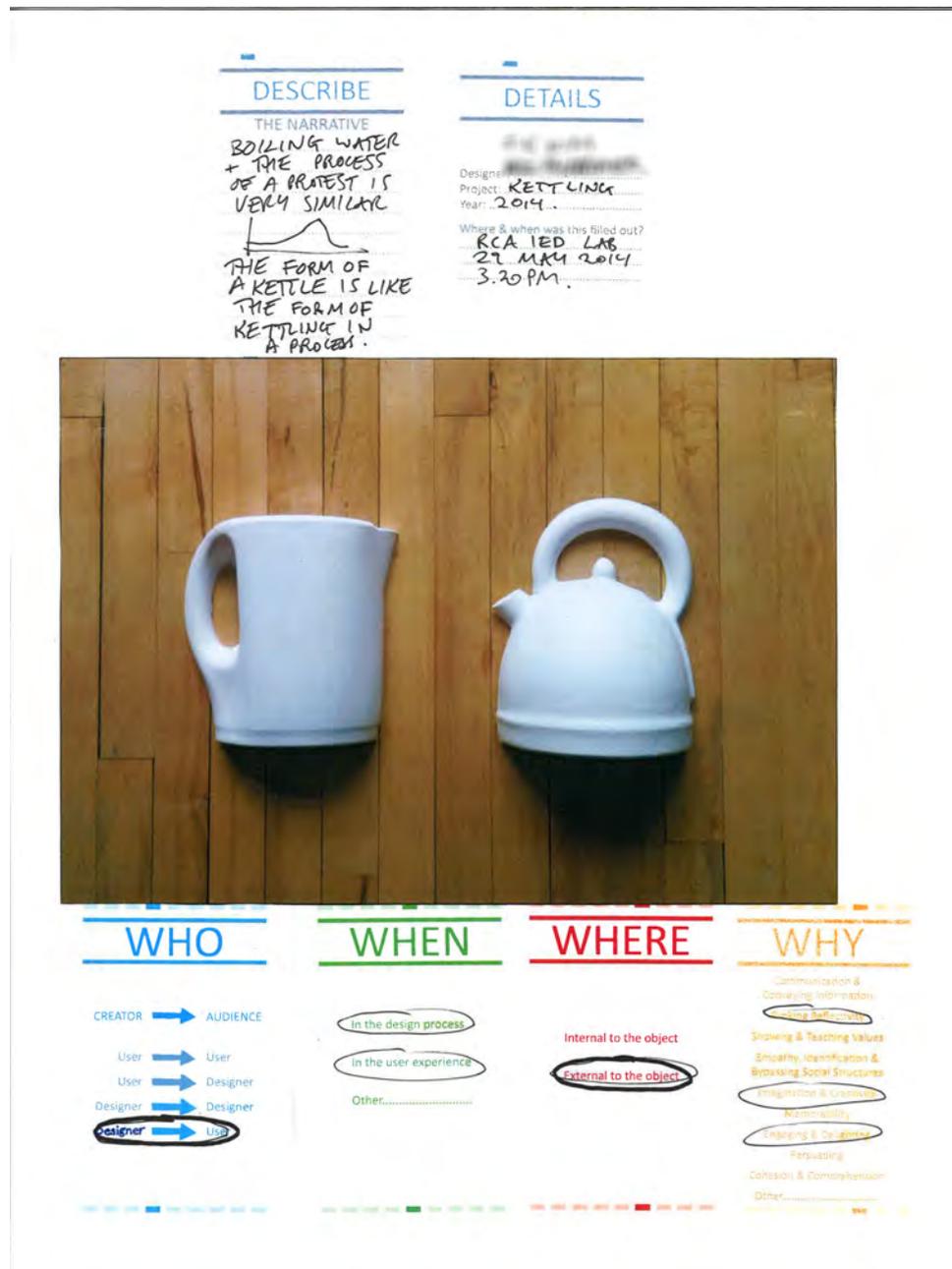
*Figure 51 Kettling – analysis. Participant work.*
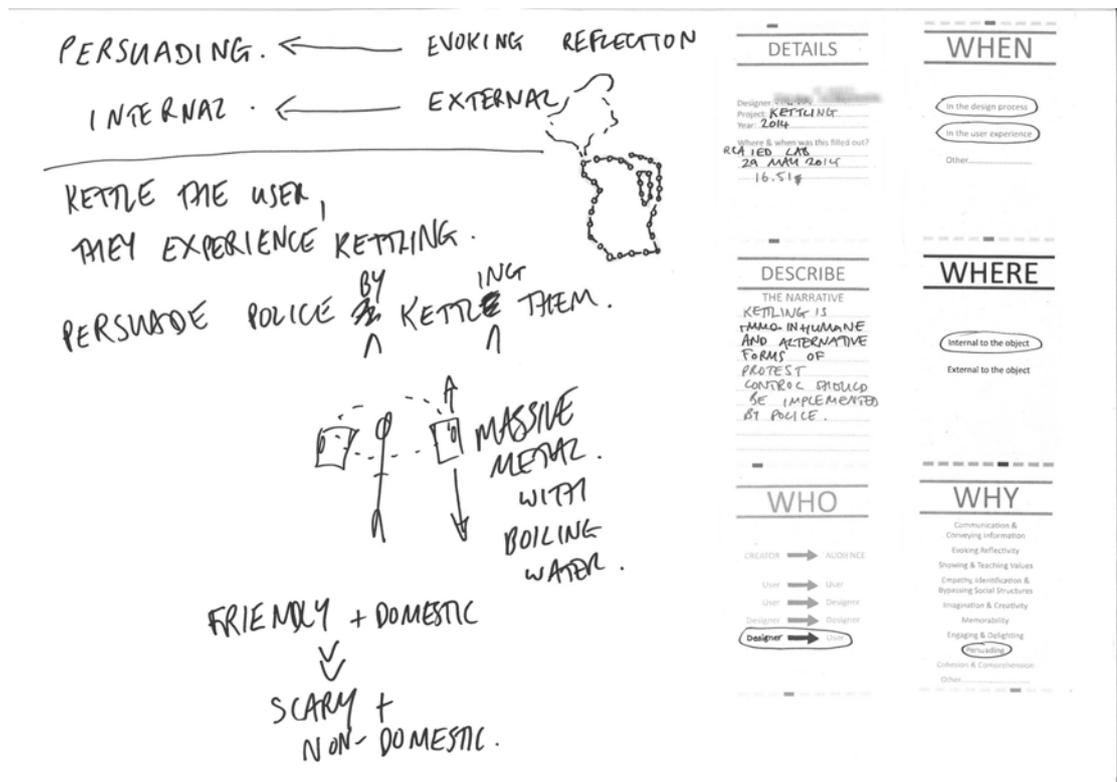
Figure 52 Kettling – redesign. Participant work.

This redesign reflects a change in aim from reflecting on an issue to persuading. The initial project is named "kettling" which was a topical issue at the time of the workshop: there were several demonstrations in London that year and the police were using "kettling" as a technique to diffuse these demonstrations. This involves containing sections of the demonstration within specific areas, limiting the movement of people into and out of that area sometimes for hours at a time, until the situation was diffused and the tension was lowered.

The initial project showed plaster casts of kettles, with the work entitled kettling, as a way to evoke reflectivity. It drew parallels between the form of a kettle and the experience of being kettled. Thinking of the narrative that the user would experience changed the audience for the design; the participant changed the design from an aesthetic consideration of parallels in the form of a kettle and the experience of being kettled, which would be understood by few specialists, to an

experience of being kettled that involves the sensory experience of the sound of boiling water. This makes the narrative more explicit to the user as well as persuading people that this technique is inhumane.

The fact that the participant had to focus on the narrative from different points of view, including what narratives the user would come away with, allowed the design to move beyond the formal approach it had taken. Also, the fact that the categories for *Why* were spelled out meant that the designer could focus on *persuading* as a separate aim than *evoking reflectivity*, and focused the narrative in the design accordingly.

In most of the examples the participants were able to question the authorship of the narratives involved in the design work, the audience for these narratives as well as the aims of the narratives and the ways in which these would be experienced.

The one card that didn't feature in the discussion as much was the *What* card, describing the type of narrative. Through observation it was seen that this didn't help to reposition designs, but allowed participants to analyse the depth of narrative present. This will be discussed in the conclusions and will feature in further work.

4.2.4 Feedback from the participants

Feedback was collected after some of the workshops (Workshops A, B, C, D and H) through anonymous free comments on the cards, while in the rest of the workshops only informal feedback was collected. In addition, the lead tutors for groups of students who took part in the workshops got back in touch when they spotted some of the tools or the language being used in further projects after the end of the workshops. Feedback collected is overwhelmingly positive and most participants have found the workshop helpful to their understanding of the way narrative works in design and to informing the way they approach design work. Many have reported that it has helped generate ideas and focus their thinking. There were a few negative comments about the format of the workshop (the main point was that it was too short and fast) and one negative comment about the examples shown which did not directly relate to the specific design discipline of the participant. The only comment that was negative about the whole approach was "The kit is too restrictive. At the end everything is/has a narrative so what's the point of it all?" (participant, Workshop C). Interestingly the fact that all design is and has a narrative was the

starting point for the workshop as well, and the point was to better be able to understand and manipulate these narratives.

Feedback comments about the toolkit itself and the content of the workshop, as opposed to the structure of the workshop, clearly addressed three main areas, how it helps the participants identify, articulate and manipulate narrative concepts within design work. A few comments covered all three areas. Of note is the comment from a foundation student who participated in workshop G and then wrote about it in the coursework blog – this was then signalled by the tutor who had facilitated this workshop.

> *The workshop has encouraged me to really question the whole project and my design process, which leads to a much better understanding about what the project is really about, this will then lead to a more focused and well developed project. What I realised after this workshop is that a lot of design, especially conceptual ones are implicit to the user or audience. As users we tend to make a lot of assumptions and suggestions about a particular product that we're using. We rarely truly understand a product until we really look into the story behind it and what the designer's intention of designing it was."*

> *(Workshop G Participant)*

The workshop helped this foundation student, at a pre-university level of study, to reflect upon, question and manipulate what their design work is about, as well as providing a level of understanding of the difference between the user's interpretation of an artefact and the designer's intention.

Identify

Participants reported in the feedback that they understood the concept of narrative much better as well as the ways they can use it within the design process and how they can view design work through a narrative lens.

"Understand much better the multi-faceted natures of narratives and how design of an object can be adjusted for different outcomes." (Workshop D participant)

"And because of these tools I can remember that there are many ways to be narrative and how to use it." (Workshop A participant)

Overall, feedback pointed to the conclusion that the toolkit had helped the participants think about design differently, giving more consideration to the communication of a narrative between the designer and the user; they understood the ways in which narrative is present within design work and they saw the relevance of this approach to their own thinking and design practice.

Articulate

In addition to a greater understanding of the concepts and how they are applied, many participants reported that they were able to use these concepts to analyse their own design practice and articulate the ways in which narrative plays or can play a part in their design practice.

"Very useful in making me think about the audience for my project + what I'm trying to say to them." (Workshop C participant)

"Very interesting way to analyse our own projects, I will certainly give more thought to the narrative aspect when designing future projects" (Workshop B participant)

Using the toolkit provided a way for participants to structure their understanding of narrative and a different lens through which to look at their project work.

Manipulate

In the last part of the workshop, participants were asked to use the toolkit as a generative tool and reported that the exercise helped them to understand how to manipulate the narrative elements of a designed artefact, as well as it being a prolific method for sparking design concepts.

"Very helpful to understand how we can use and change our narrative in a project" (Workshop A participant)

"Especially the re-design part gave me new ideas to work with my research project + try a new way of designing." (Workshop C participant)

The Toolkit was a good way to change the direction of a design project through considering its narrative elements. Most participants found it easy to use in a generative way, which was clear from observing the workshops and the ways in which most participants were able to quickly engage in the redesign and repositioning process. In addition, participants were working in small groups very effectively on the redesigns, which may be a consequence of focussing on the narrative elements of these designs, fostering communication between members of the group. Most of the feedback on this last phase of the workshop also points to the fact that participants felt like they were more in control of the narratives associated with their design as a result of using the toolkit.

Workshop F, in which the method was presented and used with a group of art and design tutors within a university setting, led to informal feedback on the usefulness of the toolkit as a pedagogic tool, both verbally at the end of the workshop and by email in the subsequent days. Several participants requested to use the toolkit in a pedagogic setting. One of these requests is recorded in this paper as Workshop G, which was led by the course tutor and carried out without the author present.

4.2.5 Conclusions and Discussion

There is a good case for using this tool as an additional method within both a pedagogic and professional design setting and across design disciplines. In particular, the tool can be valuable in those cases in which the narrative and communication between designer and user is intrinsic to the design outcome. Focussing on the narrative can enrich the designer's understanding of what their work is about, not just what the work is for, and allow the designer to use narrative to create different effects in the user or within the design team, such as communicating more effectively, fostering empathy or evoking reflection.

When used in an analytic or in a generative way, the toolkit helps designers to identify, articulate and manipulate narrative properties of their designs. This focus on the narrative properties of the design forces designers to engage with three aspects:

1. The designer is forced to envision and engage with the user experience of their design, and is encouraged to see this from the user's point of view. This is more embedded in certain fields of design rather than others, yet participants across

several design fields reported finding the toolkit useful for engaging with and envisioning a potential user experience.

2. Designers are specifically asked to engage with the user's interpretation of the design – by posing the question in narrative terms the toolkit helps designers to vocalise and describe possible interpretations. Again, this is embedded within certain design practices but it is not done in all design fields.

3. The toolkit reinforces the idea that all details of the design communicate to the user, and helps to focalise design choices in terms of designer-user communication.

The three aspects listed above can be highlighted in other ways and through other methods that do not involve narrative, however the Narratives in Design Toolkit is a focussed way in which designers and design students can engage with these aspects during the design process or through design analysis. In other words, the Toolkit encourages designers to address how their design would be interpreted and used over time by a user, how users may relate to that design, or how they may relate to other people through the design.

The toolkit can also help designers to understand the range of ways in which they can use narrative within the design process or as a way of organising the user experience, to help direct the way user experience unfolds over time, and how this is interpreted, understood, remembered and retold by the user. For example, having a list of possible aims for the design in the *Why* category helps designers to focus the design process towards a specific aim. During the workshops, some participants refocused the *Why* category of some of their design work, for example from *Engaging Reflectivity* to *Persuading* and this enabled the participant to refine the design based on the reasons why they may be designing this particular thing. As another example, using the *Who* categories can provide a way for designers to engage with questions of authorship: while discussing the design itself it is clear that the designer is usually the author (with the exception of co-design and participatory practices) discussing the narrative related to the design can show how the narrative may have different authorship than solely the designer, and the designer can foster this type of engagement in the user.

4.2.6 Reflection on the Narratives in Design Toolkit

The Narratives in Design Toolkit was initially developed to test how the framework of Narrative Definitions, Narrative Typology and Narrative Functions, outlined in Chapter 1 and 2, could be communicated to designers and to design students. As the toolkit developed, it became more and more aligned to the design methods used in Case Study 1, especially when used as a generative tool. In a sense the design methods from Case Study 1 and the Narratives in Design Toolkit generative methods converged, so though Case Study 1 used a Matrix to represent the different parameters instead of the five W's, the generative use of the Toolkit and the design methods in Case Study 1 are, in essence, the same.

Because of this, the Toolkit presented the same limitations that were found on reflection in Case Study 1 (Section 4.1.5, p. 142). While it helped the designers to think in more conceptual ways and focus on the narrative aspects of the design, it didn't focus enough on the sequencing of micro-events within a single interaction, which is central to this research. The Toolkit focuses on one micro-event at a time, and did not highlight the sense of time that is inherent in the experience of use of a product as described in Chapter 1 and Chapter 2.

The *What* card was overlooked throughout the testing, and upon reflection this card was more valuable as a way to create a scale of narrativity that could be used in conjunction with the other cards, as opposed to using it independently. Case Study 2, in Section 4.3 (below), explores different ways of using this toolkit to focus on multiple points within the experience of use, using the *What* card as a scale of narrativity. The Narratives in Design Toolkit is then revised into a version 2, which is described in Section 4.4 (p. 191).

4.3 Case Study 2 – Design Process of Kettle 3 (K3) and Kettle 4 (K4)

4.3.1 Film Analysis and Design Briefs

Two kettles were designed in Case Study 2, based on the films *Wristcutters: A Love Story* (Dukic, 2007) and *Vera Drake* (Leigh, 2004).

Wristcutters: A Love Story starts with a scene in which the protagonist is meticulously cleaning his flat, and then proceeds to slit his wrists in the bathroom. As he lay dying he imagines what his girlfriend will do after he is dead, and the imagined story culminates with his girlfriend in another man's house. As the two are starting to kiss the scene pans out to focus on a kettle which starts whistling. The image fades and the protagonist wakes up in the afterworld. The kettle in the scene is used as a straightforward device to fade out on, while the whistle introduces the entry to another world.

Title: Wristcutters: A Love Story	Year: 2006	Notes: none
Scene: min 0 to 6.16 (kettle at 4.55)	Genre: comedy, drama, fantasy	
Object: kettle	Source: IMDB forum	

Title: Wristcutters: A Love Story

Scene: min 0 to 6.16 (kettle at 4.55)

Object: kettle

Year: 2006

Genre: comedy, drama, fantasy

Source: IMDB forum

Notes: none

40
160
70
40
10
40

visual effects supervisor
CHRIS DAWSON

titles

Protagonist gets up, puts on music, cleans the house

Protagonist commits suicide in nice flat bathroom

Protagonist imagines what his girlfriend is doing

Kettle whistles

Cut to protagonist in gray world squallid toilet

---

Title: Wristcutters: A Love Story

Scene: min 0 to 6.16 (kettle at 4.55)

Object: kettle

Year: 2006

Genre: comedy, drama, fantasy

Source: IMDB forum

Notes: none

40
160
70
40
10
40

value: depression

titles

Protagonist gets up, puts on music, cleans the house

Protagonist commits suicide in nice flat bathroom

Protagonist imagines what his girlfriend is doing

Kettle whistles

Cut to protagonist in gray world squallid toilet

role of the object:
metaphorical: represents domesticity, settling down, consoling | device for moving out of the scene into another world

Title: Wristcutters: A Love Story Scene: min 0 to 6.16 (kettle at 4.55) Object: kettle	Year: 2006 Genre: comedy, drama, fantasy Source: IMDB forum	Notes: none
Conflict: depression Objective: to feel better?	Who: protagonist Antagonist: fictional lover?	Context of film: protagonist commits suicide by cutting his wrists in the initial scene. He then imagines what happened to his girlfriend after he died.

Possible briefs from this film: - kettle as a device to switch between worlds. Or kettle whistle. - kettle comes into the imagination of the protagonist to represent that the other man has got her. Possession in a sequal and relationship way - represents cosyness and normalcy (in contrast to the next scene in the "other world"	Possible briefs from comparing films: - kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast") - comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.	Notes:

Figure 53 Analysis of Wristcutters: A Love Story. Author's own. (Larger version in Appendix 10).

Because the kettle was used in this film as a strong device, and because some of the other possible briefs had already come up in Case Study 1, only one brief was written for this film:

Brief 1 (W1) sudden shift between worlds – this is a kettle that signals a change of focus from our world to another world, possibly an imaginary world, or a change of setting.

This brief will be developed into prototypes and this process is explained in the Design Process Section 4.3.2, below.

Vera Drake also features a kettle in the first scene, before the opening credits roll. However, in contrast to the other selected films, the kettle appears in various scenes throughout the film, and is usually the last object to leave the scene when it appears. Vera is a middle-aged woman in post-war England, and she is shown in the opening scene visiting a local elderly man to check up on him and to make him a cup of tea. Kettles are shown three more times throughout the film, and in each of these scenes the kettle is used to perform an illegal abortion. All the kettles that feature in this film are old fashioned metal kettles, and they usually have a cloth draped over them,

either to be able to handle them when hot, or to explicitly conceal them, for example in one of the abortion scenes Vera secretly performs this abortion on a woman while the woman's oblivious husband is in another room in the house. The film climaxes in Vera's arrest and trial, and during the trial her history and her motivation for performing abortions are brought to light, and show that Vera was performing the abortions as a way to care for the girls. In a sense the kettle connects all these scenes in which Vera is caring for strangers.

Title: Vera Drake
Scenes: 2.00 min; 21 min; 30 min; 45 min
Object: kettle

Year: 2004
Genre: crime, drama
Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

Title: Vera Drake
Scenes: 2.00 min; 21 min; 30 min; 45 min
Object: kettle

Year: 2004
Genre: crime, drama
Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

Title: Vera Drake
Scenes: 2.00 min; 21 min; 30 min; 45 min
Object: kettle

Year: 2004
Genre: crime, drama
Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

min 2

min 21

min 30

min 45

value: caring - charge

54 last abortion, hospital

1.05 police arrive

1.20 police questioning "did it happen to you?"

1.50 court defense (caring)

Kettle to make tea for ill old man

Kettle for young girl's abortion

Kettle for abortion for mother of lots

Kettle for abortion for frightened girl

role of the object:
establishing character, and acts, as caring/helping

Title: Vera Drake
Scenes: 2.00 min; 21 min; 30 min; 45 min
Object: kettle

Year: 2004
Genre: crime, drama
Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

Conflict: contast between helping people by visiting and making tea and helping people by performing illegal abortions
Objective: to help people, to care for people

Who: protagonist
Antagonist: morals? society, law

Context of film: Vera Drake is well known in her neighbourhood as someone who is always ready to help people in trouble, ill, etc. She also helps women by performing illegal abortions. In both she goes in, uses kettle, leaves.

Possible briefs from this film:

- a device for framing an act as a caring act
- a device for establishing a person's character as a caring one
- domestic object used to do the opposite of "domestic"
- constrast with the teapot - kettle is definitely a utilitarian object, a means to an end. The teapot is very different in the film.
- Kettle is somewhat dangerous – it's picked up with a cloth in the first scene, it is concealed from the husband in the third scene.

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

- kettle stays in the frame a lot - scene 2 and scene 4 especially, where it is the last thing to disappear from the environments

Figure 54 Analysis of Vera Drake. Author's own. (Larger version in Appendix 10).

Two briefs came from the analysis of *Vera Drake*, because some of the other possible briefs intersected with briefs explored in Case Study 1:

Brief 1 (VD1) Kettle as a dangerous object to be concealed – this is picking up on the fact that a cloth is often draped on the kettle, and also on the scene in which the kettle is expressly being concealed from the pregnant woman's husband.

Brief 2 (VD2) Kettle as a device for showing the user as a caring character – this is based on the fact that in all the scenes that are then revealed as Vera Caring for strangers, the kettle is always prominent, being the last object to leave the scene, as well as the fact that the opening credits establish using the kettle as a way of caring.

These briefs are developed into prototypes and this will be shown in the Design Process section below.

4.3.2 Design Process, K3 and K4

The design process in Case Study 2 follows a slightly different method from Case Study 1. While sketch concepts were generated in a similar way to Case Study 1, these were developed through the use of the Narratives in Design Toolkit, revised to better account for the time-based aspects of the product experience, as well as the use of narrativity as a scalar quality, as illustrated by using the Narrative Definitions (*What* card in the Toolkit) as a way to build more potential for narrativity into the design.
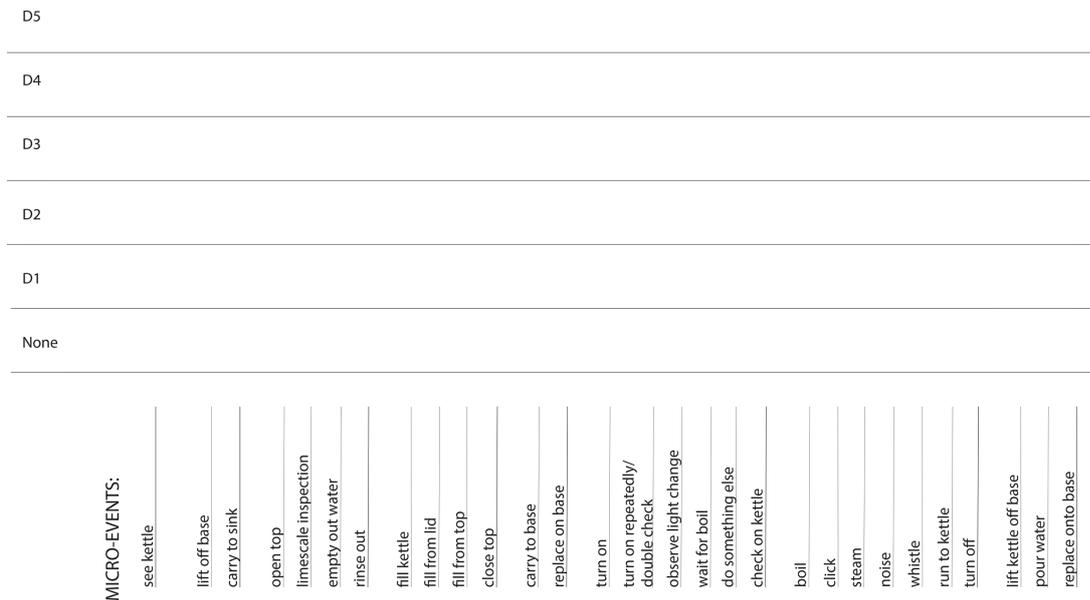
Figure 55 Timeline and Definitions scale. Author's own. Larger version in Appendix 19.

To keep the time-based aspects of the experience in mind, a Timeline was developed that clearly outlines all the possible micro-events in the product experience. This was set as a horizontal axis. A vertical axis was formed from the Narrative Definitions (*What* card) (Section 2.3, p. 67). Each sketch concept that was deemed worthwhile to explore in more detail was broken down along this scale. This allowed to easily keep in mind micro-events in the product experience as well as allowing a simple way to think about different types of events along this interaction.

4.3.3 K3 - Wristcutters Kettle

Based on the brief W1, sudden shift between worlds, the sketch concepts devised for the film *Wristcutters: A Love Story* explored different ways in which a kettle could create the feeling of entering a different world. Some sketch concepts used sound or light so the kettle could change the space and atmosphere around itself and create the feeling of entering a different world. Other sketch concepts explored how different worlds could be suggested through visual associations, which would encourage curiosity and daydreaming in the user.

180
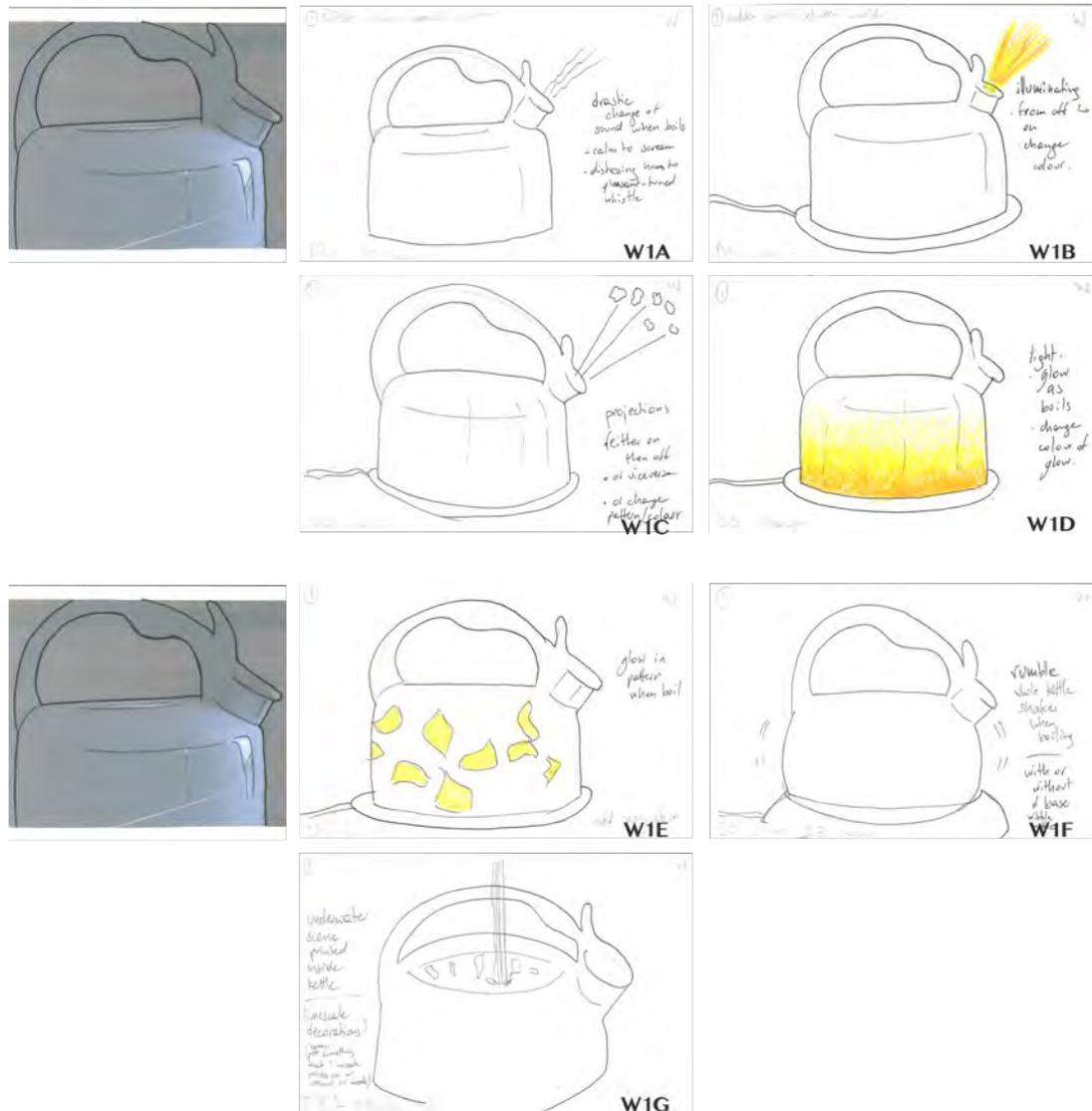
Figure 56 Sequence of Sketch Concepts W1. Author's own.

One of the sketch concepts, W1G, involved creating a different world inside the kettle from outside, so when someone looked inside while performing a "limescale inspection" (one of the quirks that came up through analysing the way people interact with kettles) they would be staring into a different world. The obvious choice for this other world was something associated with water or underwater.

This concept was then explored by looking at the whole timeline of the interaction, displayed in terms of micro-events, and each intervention into the product experience was plotted both in terms of which micro-event it affects, and also in terms of what narrative elements it contains, coming from the Narrative Definitions, or the *What* card in the Toolkit, on the vertical axis. In addition, each point of redesign was looked at from the point of view of the Typology and Narrative Functions (cards *Who, Where, When, Why* in the Toolkit). In this way several

variations were created, WG1a, which has different variations with increasingly more narrative elements throughout the time of the product experience, and W1Gb.

WG1a develops from presenting an underwater world in the moment of the "limescale inspection" to presenting a water scene from above water on the outside of the kettle, to contrast with the underwater scene on the inside of the kettle, and in its third variation when the kettle boils the above water scene changes on the outside of the kettle, creating a sense of suspense as to whether the underwater scene changed accordingly.

W1Ga
variations on the W1G kettle

D5

D4   underwater scene on the inside of the
      kettle (limescale? etched?)
      D4 affect and value

D3   NF2 reflect; NF5; creativity
      T1.2 in-the-moment story imagining

D2

D1

None

MICRO-EVENTS:
see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
turn on
turn on repeatedly/ double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

182

W1Ga
variations on the W1G kettle

First chart (top):

D5

over water scene -
etched on the outisde
of the kettle
D2 characters, entity
NF7 delight; NF5
creativity
T1.1 activates
associated stories

D4

underwater scene on the inside of the
kettle
D4 affect and value
NF2 reflect; NF5 creativity; NF9 cohesion
T3.2 structure experience over time

D3

D2

D1

None

MICRO-EVENTS:

see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base

Second chart (bottom):

W1Ga
variations on the W1G kettle

over water scene on the outside of the
kettle changes with boiling
D5 conflict, climax
NF2 reflect; NF5 creativity; NF9 cohesion;
NF3 values (climate change)
T3.2 structure experience over time

check inside - also changed
D5 conflict, climax, closure
NF2 reflect; NF5 creativity;
NF9 cohesion; NF3 values
(climate change)
T3.2 structure experience
over time

D5

over water scene -
etched on the outisde
of the kettle
D2 characters, entity
NF7 delight; NF5
creativity
T1.1 activates
associated stories

D4

underwater scene on the inside of the
kettle
D4 affect and value
NF2 reflect; NF5 creativity; NF9 cohesion
T3.2 structure experience over time

suspense - will it change inside too?

D3

D2

D1

None

MICRO-EVENTS:

see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base

183

W1Gb
variations on the W1G kettle

Fish swim
D5 conflict, climax, closure
NF7 delight; NF9 cohesion;
NF4 empathy
T3.2 structure over time
T1.2 in the moment story
imagining

D5

See fish, fish float when filled

D4   there are things in the
      kettle (expectation)

D3

D2

D1

None

MICRO-EVENTS:

see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
turn on
turn on repeatedly/ double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

*Figure 57 variations on the W1G kettle based on Toolkit 2. Author's own. Larger version in Appendix 15.*

WG1b is instead a variation on this concept; the kettle is a glass kettle, and inside are some small fish. When the kettle is filled the fish float, and when the kettle boils the fish swim around. This concept was selected for development because it provided interest throughout the timeline of the product experience, as well as for convenience, as it was a simpler concept to prototype and test.

The glass kettle was selected because of it rounded shape, which can suggest the shape of a fish bowl, and because when it is on it glows blue, resembling the type of lighting in fish tanks. After exploring different options of plastic fish for aquariums, which are not food safe nor can withstand boiling, simple shapes were carved out of wood to represent fish.

184

Figure 58 Kettle 4 based on the film Wristcutters. Author's own.

The time-based aspect of the kettle is documented through a film in Appendix 21, and the full design process is in Appendix 15. The final prototype was tested with users and the resulting interviews analysed for markers of narrativity; the analysis will be described in Section 5.2 (p. 204) and Section 5.3 (p. 209).

4.3.4 K4 – Vera Drake Kettle

This kettle was by far the most difficult to brainstorm and for which to come up with sketch concepts, in part because the briefs for this kettle were very similar to some of the briefs explored in Case Study 1, and also because the content of the film was difficult to work with. For a very long time, from the beginning of Case Study 1 when I initially brainstormed all four films, I was blocked in the design process having only one lonely sketch concept.

In Case Study 2, the two briefs, VD1, kettle as a dangerous object to be concealed, and VD2, kettle as a device for showing the user as a caring character, were explored again through a series of sketch concepts, but all of these sketch concepts felt too literal and naïve.

Figure 59 Sketch Concepts for brief VD1. Author's own.

Figure 60 Sketch Concepts for brief VD2. Author's own.

The revised design process method helped to unblock my thinking and led to a design I was happy with developing further, and part of this is due to the fact that the method made me to look at different aspects of the experience over time and experiment with ways in which briefs VD1 and VD2 could intersect over the product experience.

VD1 / VD2 variations
VD1Ea

D5

See Concealed kettle
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
turn on
turn on repeatedly/ double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

VD1 / VD2 variations
VD1Eb

Hot On Button
agency, NF2 reflection, NF9 cohesion
T3.1 structures user experience

D5

See Concealed kettle
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
turn on
turn on repeatedly/ double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

187

VD1 / VD2 variations
VD1Ec

As it boils the pattern turns into
caring pattern
agency, NF2 reflection, NF9 cohesion,
NF7 delight
T3.1 structures user experience

D5

See kettle - warns of danger
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
turn on
turn on repeatedly/ double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

Figure 61 variations on the VD1E kettle based on Toolkit 2. Author's own. Larger version in Appendix 15.

The sketch concept selected for redevelopment is VD1Ec, in which the kettle warns the user that there might be a danger through red hazard stripes on its side, but as the water boils the stripes turn into a bird and pattern instead, that symbolises caring.

This sketch concept was developed into a prototype by selecting an old fashioned looking kettle that is dainty and very curvy, to be in line with the setting of the film. The pattern was explored in different ways, looking at symbols of caring, such as hearts, as well as how these could be represented in a way that references the setting of the film. This was not leading to a suitable solution, and still felt superficial in its visual approach. Watching the film again specifically for patterns, the wallpaper in Vera Drake's house stood out for its leafy pattern featuring birds. A simplified version of this pattern was developed and transferred onto the kettle, to be revealed when the water gets warm enough to fade the thermochromic stripes.

Figure 62 Experiments with heart patterns. Author's own, with samples from www.pinterest.com.

Figure 63 Pattern inspired by the wallpaper. Author's own, and screenshots from (Leigh, 2004).

Figure 64 Kettle based on the film Vera Drake. Author's own.

The time-based aspect of the kettle is documented through a film in Appendix 21, and the full design process is in Appendix 15. The final prototype was tested with users and the resulting interviews analysed for markers of narrativity; the analysis will be described in Section 5.2 (p. 204) and Section 5.3 (p. 209).

4.3.5 Reflections on the Revised Design Process

The revised design process made the focus on the time-based aspects of the product experience more evident and allowed to combine the Narrative Definitions (or Toolkit card *What*), as a scalar quality to indicate the narrativity of the micro-event, with the desired effects of this narrative on the user, expressed either through the Typology and Narrative Functions or through Toolkit cards *Who*, *Where*, *When*, and *Why*.

This helped to evolve some of the sketch concepts in a quick way and to stay on focus in terms of designing for the narrative aspects of the product experience. It also allowed for the multiple layering of uses of narrative in design (Typology, or Toolkit cards *Who*, *Where* and *When*) and effects of narrative in design (Narrative Functions, or Toolkit card *Why*). This layering is a more realistic depiction of how users' interpretations of products might be multi-layered and complex.

4.4 Narratives in Design Toolkit – version 2

The second version of the Narratives in Design Toolkit is not a complete redesign of the toolkit, but a different way to use the existing toolkit as a generative method that takes better account of the time-based aspects of the experience, the scalar qualities of narrativity, and the multi-layered interpretations of a product experience, based on Case Study 2. The Toolkit cards come with a printed Timeline sheet on A3, showing on the left the scale of narrativity, related to the Narrative Definitions and the *What* card, and on the bottom a space for writing in a breakdown of micro-events in a single interaction.

WHAT

entertainement
narrative

value-laden
narrative

logically
sequenced
narrative

sequenced
narrative

minimal
narrative

None

MICRO-EVENTS:

Figure 65 Blank Timeline sheet for Toolkit version 2. Author's own. A larger version is attached in Appendix 19.

Designers are encouraged to break down the product experience of the object they are designing into micro-events, including not only those events that all users will experience but also those that might be less common, or quirks of use. These would then be listed in the lines under the micro-events heading as shown in Figure 66. This can be used to cover different time scales, from a single interaction with a

product to a more developed relationship in which products are used over the course of months or years.

WHAT

entertainement narrative

value-laden narrative

logically sequenced narrative

sequenced narrative

minimal narrative

None

MICRO-EVENTS:

see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base

Figure 66 Timeline sheet, with filled in micro-events. Author's own.

Following this the sheet can be photocopied and the copies used as a way to iterate the design. Each design concept deriving from a brainstorming session can be plotted along the Timeline sheet, looking at the micro-events in the product experience and quickly assessing their narrativity according to the *What* card. Each point that is plotted can then be analysed using the *Who*, *Where*, *When* and *Why* cards. All 5 cards can then be used in relation to the micro-events as a way to prompt new iterations of the design concept.

For example, a designer working on a kettle might ask what might happen if there were a more narrative micro-event for "turn on the kettle", and specifically what this might look like when trying to use narrative to evoke reflectivity. Following this question, they might then want to look at the micro-event "turn off the kettle" and see in what ways this could connect to the previous to create a coherent story, or they could vary this design by looking at the "wait for boil" or different points on the timeline. A designer might also ask themselves how to increase the narrativity of particular micro-events, or how to prompt the user to think of a narrative that is external to the designed product. In this way, the toolkit would prompt variations

192

on a design concept, while concentrating on how the product experience unfolds over time.

4.5 Conclusions and insights

Designing for narrative product experience was explored through a survey of design work that is deemed to possess narrative qualities in Chapter 1 (p. 31), identifying in what ways designers use narratives in the design process and how designers' work is interpreted by users in narrative ways. Chapter 2 (p. 51) provided the theoretical framing to look at product experiences as narratives, thus focussing on certain elements of narrative as well as the time-based aspects of the experience. This chapter describes the development of the practical applications of this theory to the design process, in particular focussing on the idea generation stages of the process as well as speculative design practices, showing how elements from narrative theory could be incorporated into designed products, and what value these could bring to designers within the design process. In addition, this chapter provides a way to communicate these design methods to designers and design students, through the Narratives in Design Toolkit.

Chapter 4 develops through two case studies of the author's own design work as well as the development of a Toolkit and the testing of this toolkit with design students. Design methods used in the Case Studies as well as the Toolkit were then revised following the second Case Study to better address the specific elements of time throughout a product interaction, and the multi-layered nature of product interpretation.

This chapter contributes to the knowledge in the following areas:

- **The Narratives in Design Toolkit provides a tool and a language for designers to talk about narratives within design work, and make it easier for designers to focus on elements of narrative theory within the design process.** Though narratives have been extensively used in design in the last decade (McCarthy and Wright, 2010), there is a lack of unified language around narrative terms, which can lead to misunderstandings in terms of what is considered to be narrative within a

design or within the design process, the presentation of the product or the user experience.

- **The narrative design methods shown in Case Study 1 and Case Study 2, and codified in the Narratives in Design Toolkit, show a way in which elements of narrative theory can be used by designers to design products focusing on the narrative aspects of their product experiences.** Designers can use these methods in order to design more tellable objects, resulting in product experiences with more narrativity.

- **The specific methods that lead from film examples to briefs for kettle design could also be followed as a model or adapted in other projects.** This would involve not only using the Narratives in Design Toolkit, but also analysing films to come up with briefs for speculative design projects.

- **The practice-based outcomes of the study, Kettles 1, 2, 3 and 4, can be used as examples of how to use the design methods and what effects these may obtain.** These are not the main contributions to the knowledge, nor the main outcomes of the research, they function as examples of how this process could be followed and to what effect.

It is important to this study that the theoretical outcomes are grounded in design theory, what Nigel Cross defines as "designerly" ways of knowing, and more specifically "design praxiology" as the theory of design practice (Cross, 1999). Using narrative as a framing concept during the design process can be a valuable way to envision how a product experience unfolds over time, and can be a way of articulating how design can be interpreted over the time of the product experience.

Chapter 5, below, describes the testing and qualitative analysis of the kettles, showing in what ways the design methods have affected the users' interpretation of the products.

Chapter 5: Qualitative Analysis

5.0   Introduction: why test the prototypes with users?

Researching how a method for designing tellable products might affect the narrativity of the product experience, it was important that the kettle prototypes were tested with participants in order to analyse the ways in which users interpret, remember and retell the product experience.

Testing aimed to elicit a narrative response to the kettle prototypes, as well as a comparison with the participants' narrative response to their own kettles, or kettles they had used in the past. The narrative response was then qualitatively analysed to describe the type of narrativity that was present in the different participant narratives when talking about their own kettles or the kettle prototypes.

There were some constraints to this method that arose from convenience and health and safety concerns. Though this research was epistemologically positioned within a Field category, according to the Field Lab Gallery model described by Koskinen, Binder and Redström, the testing was carried out in a slightly Lab-like environment of a university classroom (Koskinen, Binder and Redström, 2008) (See Methodology Section 3.1, p. 89 and Section 3.3.5, p. 113). This was because I did not feel comfortable inviting unknown participants into a more intimate space such as a private home, and the modifications necessary to make everyone feel safe, for example having additional people present, would have made the situation less intimate and the conversation more strained. It wasn't possible for the purposes of this study to extend the testing time over a few weeks, for example by giving out the prototypes for participants to use at home, because the focus is on a single-use interaction. The Lab-like environment was mitigated by the provision of tea and cake or biscuits, and the informal nature of the semi-structured interview.

5.1 How testing was carried out

The four prototypes designed in Case Study 1 (K1 and K2) and Case Study 2 (K3 and K4) were tested with participants in individual sessions and in group sessions. The individual sessions tested two prototypes at a time; four participants tested K1 and

K2, and three participants tested K3 and K4. These testing sessions were carried out at the University of the Arts London and participants were recruited through an Eventbrite invitation that was publicised on Twitter and Facebook using hashtags related to London, DIY, and objects, and on groups that are interested in objects, such as Freecycle and local selling and swapping groups. In addition, physical leaflets were dropped in theatres, cultural venues and co-working spaces in proximity of the testing location. This resulted in a mixed group of participants, ranging in age from university students to late middle age, male and female, and with a variety of backgrounds and nationalities. Participants were informed that their first name, photographs and video of the testing session may be used in publications and other dissemination materials relating to this research, and that they had a right to pull out of the research at any moment. Participants are referred to by their first names only throughout the study in accordance with the consent granted, and private details have been handled in line with the University of the Arts London's ethics guidance.

Before coming to the session participants were asked to email in or bring with them a picture of their kettle at home, or what they use to boil water. The room was set up with a table with the two kettles and tea-making implements: cups, different types of tea, milk, spoons, sugar. Cake was on offer as well. A camera was set up on a tripod to take photographs and video of the tea making. In a separate area of the same room a table was set up with chairs for researcher and participant to sit and conduct the interview, with an audio recorder.

Figure 67 Examples of setting for testing. Author's own.

The interviews were conducted in an informal manner, while drinking tea and eating cake, with general questions to start the conversation off, but trying to allow as much space to the participant to follow trains of thought. Prompting questions

were used to extend the conversation about particular topics, and to encourage more detail. A set of pre-prepared prompting questions were used during the conversation. The interview schedule can be found in Table 9, though this was used as a guide, and other prompting questions were asked as well as part of the conversation. Questions were grouped with one main question followed by prompting questions, and anything that had already been answered was skipped. Questions were also used as a checklist of topics to cover, or in case the conversation stalled. Emphasis was put on creating a natural conversation dynamic and putting the participant at ease, rather than on following the interview schedule strictly, in order to elicit narrative responses.

Figure 68 Examples of individual testing sessions. Author's own.

Upon arrival and after completing the ethics procedures, the photo of the participant's kettle was used as a starting point to talk about their own kettle, to describe its form and how they use it, as well as when they might use it and how they acquired it.

Participants were asked to make tea with two kettle prototypes in each session, and were then interviewed about this. Because of the constraints of using a room within the university, no space could be sourced with running drinkable water, so the kettles were pre-filled for all the testing sessions. This was not considered a problem because none of the kettle prototypes had any design interventions that acted upon the stage of filling the kettle.

The conversation started by asking about using this particular kettle prototype, and asking for a description of the steps of use, or how they went about it, in detail. Participants were then asked to think of their own kettle and in what ways this experience differed from their normal kettle use. Some of the prompting questions related to memories or associations, and some were used to elicit more information when some interesting aspects were mentioned. The questions were repeated for each of the two kettle prototypes tested in each session, though in most cases the conversation flowed easily from one kettle prototype to the other and back and forth between their own kettles or kettles they owned in the past. The testing sessions took between twenty and forty-five minutes, including the time necessary to use the two kettles.

Own kettle

Looking at picture

- Why did you choose this particular kettle?
    - Is it an object you could just substitute if it broke or is it something you particularly like to have around?
    - Why?

    - Any kettles you had in the past or you used in the past that you particularly like or remember?
    - What is it that you particularly like about it?

    - When do you use your kettle?
    - Is it early during the day, or later?
    - Several times?
    - On what occasions?
    - For drinks only or also for cooking?
    - What about when there are people over?

    - How do you go about using it?
    - Describe to me how you use the object.
    - What steps do you go through?
    - Do you empty it first?
    - Where do you fill it from?
    - Is it an electric one?

    - What do you do while you wait for the water to boil?
    - When do you prepare the tea or coffee, before you boil or while you wait?
    - How do you know when it is boiling?

    - Anything you do that is like a ritual, or you always do?
    - Any quirks around your use of the kettle?

Then use the kettle prototype

Participant makes the tea.
While the person uses the kettle, I prepare and plate the cake
Try to ignore them as much as possible.

Make tea, have cake, and continue the conversation.

- Ask about the kettle use. How was using this kettle?
- How was it in comparison to your regular kettle?

- Did you do anything different with this kettle than with yours at home?
- Is there anything you usually do at home you didn't do here?
- Anything you did here you don't usually do at home?

- Did it make you think of anything, remind you of anything?

Table 9 Interview Schedule.

The group sessions were carried out with year 2 undergraduate students across the School of Design at London College of Communication, who were enrolled in a theory elective unit on Experience Centred Design; the sessions were run within

class time and were followed by a lecture on the research. Students were taken in groups to a testing space, set up with a large table for conversation with chairs for all the participants and an audio recorder, and a side table with the kettles and the implements for tea. A camera was also set up for photo and video. While the testing sessions took place, the rest of the class worked on storyboarding their experience with using their own kettles (or implements they may use to boil water, as some did not use kettles). The storyboards were not used in this analysis, but they helped the students to understand the research by making them reflect on their own use of kettles.

The group sessions were run in a similar way to the individual sessions but had an open conversation between the four to eight participants in each group, and biscuits were served instead of cake. One person was asked to use the kettle prototypes and make tea for the whole group, and the others were asked to observe the use of the kettle, and were made aware that they could contribute to the conversation at any moment. The questions followed the same semi-structured format used for the individual sessions, shown in the interview schedule above, though the starting point was the testing kettle, and then the questions about their own kettles were asked when this topic came up in conversation.

The conversation developed slightly differently in the group sessions because of the different structure to the interview and also because of the group dynamics. The students that participated knew each other to varying degrees, being in the same class, so the conversation flowed easier in the group sessions, however it also went off track more. Follow-up questions were often asked by the participants, sometimes recalling things they knew about the other person, which created a more natural conversation. Group sessions took between twenty and forty minutes, depending on how talkative the group was.

Figure 69 Examples of group testing sessions. Author's own.

All the individual and group interviews were audio recorded and transcribed, and the transcriptions formed the basis of the analysis. Video and photographic evidence was not used in the analysis. Table 10 details all the testing sessions, with related transcripts, showing the participants' names, date of the session, and which kettles were tested.

TRANSCRIPT NAME	SESSION	DATE	PARTICIPANT(S)	KETTLES
K0Chao-Chi	first session: Kettle 0 (own)	25-Mar-14	Chao-Chi	0 (own)
K0Ines	first session: Kettle 0 (own)	25-Mar-14	Ines	0 (own)
K0Vera	first session: Kettle 0 (own)	25-Mar-14	Vera	0 (own)
K1and2Giulia	testing session 1: kettles 1 and 2	20-Sep-16	Giulia	1 and 2
K1and2Gwen	testing session 1: kettles 1 and 2	20-Sep-16	Gwen	1 and 2
K1and2Jules	testing session 1: kettles 1 and 2	20-Sep-16	Jules	1 and 2
K1and2Tim	testing session 1: kettles 1 and 2	20-Sep-16	Tim	1 and 2
K3and4Cindy	testing session 2: kettles 3 and 4	05-Oct-17	Cindy	3 and 4
K3and4Lucy	testing session 2: kettles 3 and 4	05-Oct-17	Lucy	3 and 4
K3and4Maya	testing session 2: kettles 3 and 4	10-Nov-17	Maya	3 and 4
K1and2-Gr1	ECD students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
K1and2-Gr2	ECD students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
K1and2-Gr3	ECD students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
K1and2-Gr4	ECD students: Kettle 1 and 2	25-Oct-16	Students	1 and 2
K3Gr1	ECD students: Kettle 3	31-Jan-17	Students	3
K3Gr2	ECD students: Kettle 3	31-Jan-17	Students	3
K3Gr3	ECD students: Kettle 3	31-Jan-17	Students	3
K3Gr4	ECD students: Kettle 3	31-Jan-17	Students	3
K4Gr1	ECD students: Kettle 4	24-Oct-17	Students	4
K4Gr2	ECD students: Kettle 4	24-Oct-17	Students	4

Table 10 List of testing sessions.

From the researcher's point of view, the interviews felt like an informal conversation. The fact that tea and cake or biscuits were available helped the conversation along and made it feel like a more natural encounter, distracting the participants from the audio recorder and the camera. It also helped to build a rapport between the researcher and the participants. Only one testing session, with participant Giulia, led to and an awkward conversation that wasn't very revealing. This might have been due in part to the fact that this participant did not own a kettle so didn't have much point of reference, and in part to the fact that she was not a fluent English speaker. This was also the first testing session I carried out with the prototypes, so I also didn't have the experience to guide the conversation better.

All the other prototype testing sessions, group and individual, resulted in very rich conversations, which was not completely expected at the start of the research. The conversations moved easily back and forwards between participants' own or past kettles and the kettle prototypes being tested, and were at times very personal.

Section 5.2 below will show some sample transcripts and discuss how these were analysed.

5.2 How Qualitative Analysis was carried out

The qualitative analysis focussed on the interview transcripts, and discarded the photographs and videos as source material. There are several reasons for this decision. During the interviews users had to retell their product experience, so this was a story told by the user and from the user's perspective, which took a naturally narrative form. The research focuses on the user's interpretation of the product experience, so it was paramount that the user's own interpretation of the event of a single use of the kettle prototypes be given more importance than other clues to how that experience unfolded, such as photographic or video material. This type of retelling also discarded those details of the product experience that may have happened, but the user did not find significant.

By retelling the product experience in the form of a narrative, users were put in control of how that narrative was told, thus being able to add details such as memories or associations which were impossible to read on the film of the interaction. In addition, the analysis is focussing on narrative elements, and transcripts are commonly analysed in terms of narrative elements within the conversation. For an in-depth review of narrative analysis methods for qualitatively analysing interview data see Frost (Frost, 2009). None of the established analysis methods were followed strictly because the aim of this study is to gather qualitative reactions to the prototypes, as opposed to gathering insights that might be linguistic or psychological.

Because of the focus on the spoken accounts, video evidence was collected meticulously in Testing Session 1, but was then only collected as a backup in subsequent sessions and is not presented as part of the research.

The qualitative analysis was conducted using the software Atlas.ti, following a "template approach" (Robson, 2002, p.458), using predetermined codes deriving from theory and research questions to analyse the text.

The transcripts were first divided into quotes in a similar way in which a block of text would be divided into paragraphs, keeping as much as possible a stable topic of

conversation throughout the quotes, and keeping the quotes a manageable size. Each quote was then coded in this order: Step 1 identified the session type (group, individual or first). Step 2 identified the conversation topic (K0 stands for own kettle, K1 through K4 are the four designed prototypes), and descriptions (either description of kettle, or description of use). In Step 3 the quotes were coded with narrative elements coming from the Practice Review as Narrative Functions (NF), (in Section 1.1, p. 35) and Typology Categories (T) (Section 1.2, p. 42) and Keywords (K) coming from the key concepts analysed in the Literature Review (in particular Section 2.4, p. 73). Each of these codes in Step 3 is referred to as a "marker of narrativity". The codes are shown in full in Table 11. To note, Typology Categories 2.1 and 2.2 were not included in the coding because they describe narrative use within the design process, and are not directly related to the user's product experience. The codes used are shown in Table 11.

CODES for data analysis of interviews					

Step 1	code	Step 2	code	Step 3	code
Session type	group	Conversation topic	K0 (own)	NF	NF1 - info
Session type	individual	Conversation topic	K1,2,3,4	NF	NF2 - reflection
Session type	first			NF	NF3 - values
		description	description of kettle	NF	NF4 - empathy
		description	description of use	NF	NF5 - creativity
				NF	NF6 - remember
				NF	NF7 - delight
				NF	NF8 - persuade
				NF	NF9 - cohesion
				T	T1.1 - activate associated stories
				T	T1.2 - facilitates story imagining
				T	T3.1 - accompanying external narrative
				T	T3.2 - structures experience over time
				K	Key-emotion
				K	Key-agency
				K	Key-identity
				K	Key-habit
				K	Key-anecdote
				K	Key-storyworld
				K	Key-memory

Table 11 Codes used in qualitative analysis.

The analysis focussed on markers of narrativity, through the Keyword codes, as well as indications that the prototype, or the user's own kettle, have created a situation for a Narrative Function or a Typology Category to occur. This analysis is necessarily carried out with a qualitative, as opposed to quantitative approach. The sample of participants and conversations is too small to compare quantitative data, for example how many times a word or a topic of conversation comes up in each interview. The data was not collected in a way that would allow quantitative comparisons to take place, as the researcher prompted the participants to continue trains of thought, thus making a count of certain words irrelevant. The interviews were not timed, so there isn't a specific quantity of material about each kettle to compare. In addition, the kettles were not tested against a neutral or "typical" kettle, used in the same experimental setting, but were compared to participant's past experiences with kettles; these past experiences are much more laden with meaning and potential narrativity than a single use of a "standard" kettle, because they intersect with a person's personality, life story, memories, and anecdotes of daily life.

The analysis therefore did not focus on the amount of narrativity present, but on what types of narratives participants retold about the product experience, in what way people chose to retell this story, and how the prototypes prompted or created certain types of interpretations and narratives.

Twenty transcripts were collected, and the data contained within is complex and multi-layered, and requires a process of interpretation through the analysis. Some of the quotes or sections of the transcript are fairly straightforward, and can be conclusively coded against one keyword and one kettle. Other quotes or sections of the transcripts are coded against several of the Keywords, and one or two of the Narrative Functions, and one or two kettles. This makes the results of the analysis fairly complex. A sample of transcripts, with codes, are available in Appendix 20. This appendix shows some of the sections of the transcripts, to illustrate how the analysis was conducted as well as show the qualities of the conversations in the testing sessions. Each transcript is given some context in order to understand how the section shown works with the whole interview and how it might be similar or different to the other interviews. The transcript sections are kept fairly long to show how the conversation developed.

Section 5.3 (p. 209) shows how I made sense of the data and how this leads to insights and conclusions.

5.2.1 Different interviewees and how they shaped the interview data

The interview data collected was slightly different in the individual and group sessions, as well as differing in terms of the ways in which different interviewees reacted to the situation and answered the question. Table 10 lists the interviews that were conducted, and in this section I will describe a few examples of how the interviewees responded and how the stories were elicited. In particular, I will discuss two examples of individual interviews with drastically different answer styles, and some of the group sessions.

Jules, Testing Session 1, K1 and K2

Jules was an individual participant in Testing Session 1, who tested Kettle 1 (K1) and Kettle 2 (K2). His interview was interesting because he was meticulous in his descriptions of the process, and very reflective in his approach. He described how some of what he does when boiling water has to do with his OCD tendencies, such as aligning the spout of the kettle always in the direction of the cup while boiling the water, and how what he does while waiting for the kettle to boil is related to his meditation practice, which encourages him to be reflective about everyday things.

Jules spoke at length, without prompting, about the kettle experience in a stream of consciousness style, moving from topic to topic. This was typical of the way Jules interviewed, which was different from a lot of the other interviewees, who needed a lot more prompting. Jules' style of answering was very reflective, and he was very perceptive in terms of picking up clues from the kettles and responding to them, as well as paying attention to how the kettle was structuring this experience over time. The conversation naturally steered towards memories and anecdotes from his past, which he described in great detail, and he seemed to experience very vividly in response to sounds or visual clues form the kettles. He also seemed to attribute a lot of agency to the kettles he was testing, almost in a dialogue with it.

He described the kettle giving information as to what stage in the boiling process it was at, with strong attribution of agency in relation to the kettle "So I was looking out for signals which I'd never normally be doing with an electric kettle. I'd just be standing by it, but I'd placed all of my responsibility in the kettle, whereas now it was like a mad machine interaction!" This shows agency on the part of the kettle, which is demanding attention and a response from him.

Maya was one of the participants in Testing Session 2, testing Kettle 3 and Kettle 4. Maya came accompanied by a friend who was introduced as not speaking English, so didn't participate in the conversation. Both Maya and her friend took an immediate shining for Kettle 3, squealed with delight when the fish started moving, and just generally kept talking about this over and over. Maya was very much disinterested in her kettle at home. Kettles are not something that she used in her home country, but in London she felt like she should have one. She chose her kettle on the basis of efficiency, and didn't particularly research the model, she "just went to the shop and bought them." It's interesting to note the different style of interview when compared to the previous example of Jules, and my role as a researcher in this interview had to be more active than in others, guiding the conversation more.

Maya was disinterested in Kettle 4, dismissing it as "it's nice, but". It was an interesting interview as I tried over and over throughout the interview to bring the conversation back to Kettle 4, but it just didn't seem to resonate with Maya, or she was so taken with Kettle 3 that it was weaker in comparison so didn't hold her attention.

She did however assign a lot of agency to the fish: "the fishes [SIC] start swimming up and down" as well as emotion and empathy "I saw them at the bottom and wanted to be sure I wasn't making fish soup!". She showed delight with the kettle, as the conversation was full of laughter. Kettle 3 really captivated her attention throughout the testing session and structured the whole session for her.

Group sessions

All of the group testing sessions developed in a similar way, and the group dynamics were fairly consistent throughout the sessions. The differences were due to having to fit into a class schedule, so in some sessions only one kettle prototype was tested because it was the only one available at the time.

These sessions were structured differently from the individual ones. The conversation didn't start from their own kettles at home, but from asking one participant to boil the water and make tea for everyone. Other participants were

asked to observe and contribute to the conversation. In addition, because these were design students, some participant questions focussed more naturally on the design and production of the prototypes themselves. This provided a challenge for me because I didn't want the participants to perceive my investment in the design, and I didn't want to spend the whole session explaining the design. I therefore kept answers to a minimum and informed the participants that they would find out more in the lecture following the testing session.As I was interviewing I was conscious that I was only using audio as part of the data collection, and I wanted to make sure that some events that were obvious to those in the room, for example the cause of a participant's laughter, were recorded. It was interesting to note that some of the participants in the group prompted each other with additional questions, as part of an open conversation, and while mostly this helped carry the conversation along, it also meant that sometimes it went farther on a tangent and had to be brought back.

However, certain questions about habits and identity came to the forefront in the group sessions, especially because the students involved in the session were form very international backgrounds. For example, one participant discusses how they like their kettles to be low maintenance, while another describes how their cheap kettle does the job well, and the process they go through to clean the limescale. Other participants reply that they would not go to that effort to clean a kettle. This shows a lot of signs of how this object is part of the participants' identity, either by not being a purchase that they would waste their time on (the five pound Argos kettle being perfect) or by not being dedicated enough to their kettle's maintenance to periodically clean the limescale.

An excerpt of the interviews, showing how these were coded, is available in Appendix 20. Section 5.3 below shows how the data was made sense of and how this leads to insights and conclusions.

5.3 Discussion of qualitative analysis

This analysis allowed to identify topics of conversation in relation to the range of kettle prototypes tested, and to compare the ways in which participants talked about each of the kettle prototypes as well as comparing the designed prototypes to how the participants talked about their own kettles or kettles they used in the past.

The analysis focussed on the markers of narrativity in the speech related to the kettles. These markers were used to give a qualitative indication of the ways in which participants discussed the different kettles, but were not used to quantify instances of certain markers appearing. The rich qualitative data deriving from the analysis of the transcripts gives interesting indications about the ways in which the participants have interpreted the kettle prototypes as well as the ways in which the prototypes have directed the users towards certain types of narrative interpretation and retelling.

This section will be divided by kettle; initially I will describe the ways in which participants talked about their own kettles, and then I will describe the ways in which participants talked about each of the kettle prototypes. I will then reflect on the ways in which people told the story of their experience with the kettle prototypes and how this differed from other "kettle stories" they retold. This section will discuss interchangeably all the transcripts, this includes those transcripts deriving from the individual testing sessions, those deriving from the group testing sessions, and those coming from the first testing sessions, even though this last group of transcripts only refers to the participants' own kettles and not the kettle prototypes.

5.3.1 K0 – Their own kettles or kettles participants have experienced in the past

When participants discussed kettles they currently owned, or ones they remembered using in the past, the conversation focussed mostly around identity, habits, emotions and anecdotes.

Identity and values

Identity in particular was a very strong theme which emerged from the analysis of participant's descriptions of their own kettles; when identity is mentioned in relation to the Kettle prototypes, the conversation usually referred back to a kettle they owned or used in the past. Values also featured in these conversations, in a way that is closely related to identity.

In particular, in-depth descriptions of kettle use seemed to elicit general statements about the participant's personality, for example about the fact that they are

impatient and don't like waiting for kettles to boil, and about the participant's aesthetic or functional purchasing choices, for example saying they don't care enough about things like kettles to invest much time in choosing a particular model, or to spend much money on one. A lot of these statements started with sentence starters such as "I'm the type of person that…" indicating that the participants were assigning this type of identity meaning into their behaviours.

In the example below, the participant details some games she plays with herself when boiling kettles, showing potentially a competitive nature.

> **Do you stop the tea beforehand?**
> Yeah, usually, because what I do is I can't drink this tea right now because it's really hot, so usually I'd stop it before, but I thought for the longevity of the team, I'd boil it.
> I always try to get to the kettle before it pops.
> **Really?**
> It's like a really dumb game; I just want to get there before it pops or as it pops, it's weirdly satisfying.
> Yeah, but not too soon, because then it would be too cold.
> Yeah, but like as you can hear it, and I leave it as late as possible, I'll be on my phone. **K3Group1**

In the following example the participants relates the choice of kettle to her mother's cultural background, and her perception of class through her purchasing choices. The participant is careful to specify that this does not reflect her identity and her taste, nor her values.

> **You did mention that it was from Marks and Spencer – is that relevant or…**
> I think it's because it's a choice of my mothers.
> **Okay.**
> It's like this Asian thing that like Marks and Spencers equals class. As for me, I don't like it. I don't think there's anything particularly special about it, and it gets really dirty, this white and I don't like it. **KoChao-chi**

Because habits were part of the line of questioning, in relation to the participant's own kettles, it is not surprising that this should be a topic of conversation. However, it was interesting to observe how many quirks people adopt when using a kettle, and how ritualized some of these interactions are.

> P5: Yeah I often find myself boiling the kettle and then walking away and forgetting about it
>
> P2: yeah forgetting about it
>
> P5: and then ten minutes later I'll boil it again
>
> [laughter]
>
> P5: and I'll boil it, and it will be boiled like 3 or 4 times
>
> P2: literally
>
> P5: by the time I make a cup of tea **K1and2Gr1**
>
> […] the spout is pointing in the direction of those cups…
>
> **Okay, is there a reason for that?**
>
> No, it's just a terrible habit.
>
> [Laughter]
>
> It's the way it's always pointed.
>
> **Yeah, okay.**
>
> It makes me feel comfortable. So it's ready to pour directly into the cups which are just in front of it. **K1and2Jules**

In the group sessions in particular, there were debates over whether kettles should be left full or empty, or how to deal with kettles in shared flats. The quirks of use were often interpreted as part of a participant's identity, reinforcing this identification between their own kettles and their identity. A lot of the quirks of use were motivated by having "heard" that one or the other sequence of use is "better", though the accounts of what is better and what is worse were often contradictory.

This is illustrated in the quotes below:

> I definitely empty it – I don't like to have stale water in it; I heard it's not good for it and that it has to be properly oxygenated with cold water and I don't put hot water in it – like from the hot tap. I tip it because it's got like a lid that flaps open and I always look at the limescale, just, Waaa, you know, I look at what's going into my tea. **K0Chao-chi**

That's the first thing I do, you check, I'm like, so I know how much water to put, because then you don't know that you've got … and very slowly as well, until the lime scale is off.

Because with the lime scale … oh no…

Yeah, if it's very, very shallow then the lime scale is going to come up.

I always put extra.

Yeah, always put extra so that you don't get lime scale.

It's disgusting. **K4Gr1**

Emotion

Emotion was interesting to analyse as it was very present in the interviews, in relation to both participants' own kettles as well as the kettle prototypes. However, the type of emotions displayed varied between these two groups. When discussing their own or past kettles, participants displayed three main types of emotion: either indifference towards their kettle, delight over particular design details that they liked in a kettle they owned, and in particular attachment to the object, deriving from the memories of particular people or settings that the kettle was part of.

The first quote below is typical of the indifference observed towards their own kettle:

> **Is it an object that you would substitute if it broke without thinking twice about it?**
> Yeah, probably. **K3and4Lucy**

In this kettle, the participant describes her delight with the design of the kettle that she liked, as well as the memory of it being a gift from her sister.

> **Any other kettles that you use that you particularly remember or…**
> Vera Yeah, I have one that's broken. It's broken.
> **Silvia Why is that?**
> Vera It's a broken red one and it was a gift and I really liked it, my sister got it for me for my birthday and it's broken and I haven't even thrown it away, that was electrical so I was just for the [unclear 04.44] and then.
> **Silvia Why did you like it particularly is it because it was a gift**

or because...

Vera Well first I really wanted it anyway [unclear 04.54] it was given to me as a gift, I really liked the colour all red and it looked good in my old kitchen and it's all plasticky and I liked the handle. **KoVera**

The last quote shows how the kettle acquired meaning and emotion by simply being around in the house while the participant was growing up.

I was really annoyed with the last kettle...

Why?

Not with the kettle itself but the fact that my parents decided to change the kettle over without notifying anyone in the house, so I was really ... I was attached to the other one!

[Laughter]

I didn't get to say goodbye!

Did they throw it away?

I don't know what they've done with it.

Why were you attached to the kettle?

Just been making the tea for so long with that kettle...

Is that the kettle you've grown up with?

Yeah.

Sounds so sad! **K3Gr4**

The fact that the participant says she didn't get to say goodbye to the kettle shows that she was really attached to it and cared for it, but the interesting thing is that this story elicited the empathy of one of the other participants in the session, who replied "sounds so sad!". According to this account, the kettle wasn't particularly special in design, or at least this wasn't specified, but it acquired meaning through its being present and witness to daily life growing up.

Anecdotes

In relation to kettles being present in daily life, participants' own kettles sparked a lot of anecdotes. I've coded as anecdotes those simple, self-contained stories that were told almost as an aside.

214

These varied between anecdotes about family members' or other people's kettle use, to anecdotes about acquiring the kettle, to interesting facts about the kettle. Below are some examples in the above order.

> My dad used to say, fill it through the spout cause it doesn't get all the limescale in. But obviously when it goes to pour it out it comes back out anyway, so [laughter] **K1and2Gr1**

> I met an American girl who had never seen a kettle like this before, because their power outlets aren't strong enough so, they only have the ones that you put on the hob and she was amazed; we were in Australia, and she was like, what are these contraptions that people have in their houses that boil water?! **K3Gr4**

> But it's … and the only reason we have this one is because I saw it in a charity shop and we had a flat mate leaving that was taking his kettle and I knew we needed one, so…
> **Interviewer: That was one of my questions actually, why did you choose this particular one.**
> Interviewee: Yeah. but it's actually quite a good one. So, I don't know, I think we bought it for like £12 in the charity shop, its DeLonghi and it came … like they also had the matching toaster. The toaster is a lot sexier than the kettle! **K1and2Gwen**

> There was a guy he was checking during every break
> P2: commercial
> P6 yeah during the TV show. He was checking like how many… how much energy was being used to during the break, to like warm up the water
> **R: ah wow**
> P2: yeah, it's like the documentary on the grid system. And when Eastenders finished, at 8PM [laughter] it would be the highest inputs, well scientifically the highest inputs that they'd have to have more people on the grids, manning it. Because, ehm, the amount of people who clicked the switch at 8.30 after Eastenders. **K1and2Gr1**

I'm not sure what conclusions can be drawn from the anecdotes, but they were flagged up because they are prototypical narratives, even if they may not meet other

criteria for this analysis. They were more common with own or past kettles, probably because they were referring to events that happened in the past.

5.3.2 Kettle prototypes in general

Participants discussed the kettle prototypes differently from the kettles they encountered in the past. This section will outline the ways in which the prototype discussions differed from the discussions of the participants' kettles. Following this, the particular markers of narrativity that were associated with each kettle prototype will be analysed.

Identity

Identity was less central a topic in the conversations about the kettle prototypes. It wasn't as prominent a feature of the conversation, though it did feature in a few cases.

In the first quote, the participant is using the kettle prototype to define his idea of taste, in contrast to the prototype:

> "A black kettle? Mmm … not really – it wouldn't go with my house; my house is quite light shades and you know, cream and flowery tiles and yellowy/orange floor and things so a black kettle wouldn't really go with that." **K1and2Tim**

Below, the participant is responding to the perceived speed of boil of the kettle prototype by defining her impatient character. Interestingly, this is a fairly quick kettle to boil, so the participant was reacting to the perceived speed, possibly influenced by the testing environment, as opposed to the actual speed of boil:

> "I can't sit there, I can't sit there for two minutes. I even … when it's the microwave, I'd stop it at like two seconds, I wouldn't even wait the last two seconds, I'd take it out." **K3Gr1** [in the context of talking about how long K3 took to boil]

The next quote shows identity, but also shows the limitation of testing within an artificial environment. The participant had reacted with extreme surprise to K1 changing colour, and when I pointed this out she was concerned that she has

somehow done something out of the norm, showing a concern with what I thought of her.

> **Interviewer: You did have quite a reaction...**
> Interviewee: I know, I was like... Is that normal – is that what most people do?
> **Interviewer: You're the second person, so...**
> Interviewee: Oh, okay. **K1and2Gwen**

Emotion

Though emotion was shown in both conversations about their own kettles as well as those about the kettle prototypes, the types of emotion shown are very different in the two cases. In the context of the kettle prototypes the emotions were less to do with attachment towards the kettle, but remembered emotions featured through association. There were also a lot of instant emotions in reaction to the kettles, such as delight, surprise, annoyance and tension.

Below is an example of an emotion that is qualified by associating a feature of the kettle, in this case its sound, to a past situation:

> Its making rather an annoying noise... It reminds me of something ... air conditioning unit. Some air conditioning units make that noise. Bad ones in cheap hotels in Ibiza or elsewhere! **K1and2Tim (K2)**

The following quotes are all examples of these instant emotions caused directly by features of the kettle prototype. These instant emotions come across quite strongly in the interviews and were very common throughout the testing sessions:

> I guess you are more engaged because you are waiting for them to do something.
> Yeah, the fish were, the fish floating was definitely at a lot of a later stage than I thought it was going to be, and they seemed like it went from, like when you could see them just start to tip up to then go full tilt was really short, I thought that would be a longer process.
> **So there was more anticipation and less gratification?**
> It's just come like oh shit, all of a sudden, they are everywhere. **K3Gr2**

> TM: It does sound dangerous
> TM: Has it got little metal balls in there or something?

P: You're scared to touch it in case you get an electric shock or something.

TM:IT all burns up or something

P: yeah

TM: I can ... I can imagine the handle gets hot as well

P: yeah

TM: the steam... **K1and2Gr3 (K2)**

The fact that it had changed? I suppose I was just intrigued watching it change.

Interviewer: Okay.

Interviewee: So, first of all I thought it was a trick of the mind, or a trick of the light; then I sort of became aware that it definitely wasn't so then I was just intrigued watching it and just seeing what it would do as it sort of moved up the various parts as it heated till it got to the spout and then, yeah... So quite engaging while I was waiting **K1and2Jules (K1)**

I find it so scary.

Really?

I think it's so scary.

Yeah, I'm always scared of those kettles which **[inaudible 00:25:30]** and I'm scared that it's going to just like, you know, the very, very old-fashioned ones, they are not electronic, you put them on a gas and then you pop the lid on and a cap and it whistles, that's why they whistle because of that cap, I'm always scared it's just going to, the water is, the steam will just like knock that...

Make it come out?

...Yeah, off the cap. **K4Gr1**

Agency

All the prototypes were perceived as having some agency at different points and by different participants, and this agency is shown by assigning human speech, human emotions to the prototypes, and treating them as characters, reacting to them with emotions such as annoyance:

> because it's on like the gas, it's like it's almost giving like too much feedback. So, like "I'm ready to come off! I'm ready to come off!" instead of just the ping, like a flick

R: yeah

P4: electric which is why I can't understand why it's doing that. Because it's like 'Come on, pot or blows, get off like". It's so annoying, like. It would just really irritate me, like. It's not pleasing at all to hear that, like [laughter] **K1and2Gr1 (K2)**

I'm just not a big fan of that element.

Why did you not like it?

Because I feel like it needs a lot of attention to it.

It's very needy.

Needy?

It's very dangerous, it's very … it's kind of… **K4Gr1**

In the following example, the participant shows empathy towards the prototype, albeit in a jokey way:

They're dying! [Laughter] **K3Gr2**

Reflection

The kettle prototypes prompted reflection in the participants, both in terms of reflecting about themselves and their personality and identity, as well as reflecting about the prototype itself or the situation.

In the first example, the participant making the tea (PT in the transcript below) notices a change of colour, but then because the other participants didn't say anything thought that maybe it had not happened.

P6: Did it change the colour?

R: yeah

P several oh yeah, cool…

P6: it was black

P? [unint]

P? it's so cool

R: no one noticed it as it was happening?

PT Yeah, I noticed it but then I was like, maybe I just didn't see that. **K1and2Gr2 (K1)**

In the following two quotes, participants needed to reflect upon the process of boiling the water in order to understand when the kettle had boiled, because they

didn't know whether the kettle would give them any signal to indicate that this had happened.

> I didn't really get much of a response from the kettle itself, so I couldn't really gauge whether it was boiled, took quite a long time to boil, so I thought there was something wrong with the kettle when there actually wasn't. And I noticed that the things on the outside change colour but I didn't feel like it gave much a response or a signal as to whether it's actually boiled. And it didn't even switch itself off either, because usually the kettles at home switch themselves off when it's boiled, whereas this one just kept on going and going and going until I switched it off. **K4Gr1**

> So, I've plugged it in, I just let it sit, I didn't really know what was going to happen when the kettle was done, I got the tea bag out and put it in the mug and as it got warmer it changed colour and so I guessed when all of the colour had gone that means it was boiled. I did also see steam though, so that was like, I definitely knew then. And then I just poured it into the mug and I stirred the tea bag around and I put the milk in. **K3and4Lucy (K4)**

Associated Stories (T1.1) and Story Imagining (T1.2)

In contrast with anecdotes related to past kettles used, in discussing the kettle prototypes participants told self-contained stories that were derived either through a process of association, or through a process of story imagining. The first examples relate to the process of association:

> Interviewee: And the other one is like the sort of thing you see in Victorian plays, melodramas, films, whatever... it's more a design that was practical in those days, that you don't ... you don't heat the handle up because it's on top.
> **Interviewer: Yeah, yeah.**
> Interviewee: Other than that, not really. The silver one looks a bit like, what do they call ... a cake wrapped in foil, a little small thing; it's that sort of... **K1and2Tim**

TM: it sounds like something's banging against the inside of it.

P3: yeah. It doesn't sound like how I would imagine a kettle would sound like.

P5: sometimes there's these [unint]

P3: like a cracker or something

P5: yeah **K1and2Gr4**

The following example relates to the process of story imagining, by imagining the kettle in a home with first children and then cats, and then imagining the child's emotional reaction to it.

> I don't know if it would be really safe to have those in your home because if you have kids...
>
> **They might want to reach for them...**
>
> ...and play with them when they're boiling, so it's not ... especially when they are moving, it's pretty exciting.
>
> It's pretty exciting!
>
> [Laughter]
>
> Can imagine a cat trying to...
>
> Yeah.
>
> If I was a kid and I saw fish in a kettle, I'd probably cry!
>
> [Laughter]
>
> Pretty traumatic experience, I'd never drink tea again. **K3Gr1**

Structuring experience over time (T3.2)

The ability of the prototypes to structure the experience of use over time was one of the main aims of the study, so it was reassuring to find in the interviews that this was an effect the participants felt.

> But then because I was sort of meditating whilst doing it, I found it sort of gave me a lot more to work with especially in terms of the sounds and that sort of evoked memories of that, on a stove that as the sound just begins very, very gently, sort of at the bottom, and a slight, sort of the metal just creaking a bit to start with and then starting to hear a little bit more as the water is warming and more creaking and moving in the kettle. And then the intensity of the sound begins to build and then obviously getting through to the point where you've got a visual sign of steam coming out of it. So, I

suppose it gave me more to work with and also that gets me because I'm very interested in how we appreciate time. So then on one hand I could sort of feel that tension of knowing that its normally quicker than this, and haven't had that experience of being in front of a kettle for that long for quite some time, but I'm quite interested in people trying to reconnect with things that take longer – either slowing things down or taking a longer-term perspective on things. […] So, I suppose it definitely adds to that kind of an experience, but at the same time, I was aware that there was a tension there because I'm almost set on automatic to expect it to happen more quickly. **K1and2Jules (K2)**

R: did the colour change of the kettle do anything for changing the experience of it?
P3: it's interesting
P5: I think it dragged it out more, cause you can see it slowly happening, whereas with a regular kettle you can't really tell till it gets just to that point
R: so does it make you more impatient do you think?
P5: yeah. As Fabio was saying, as well. **K1and2Gr1**

Some of these effects were more predictable, for example the fact that the colour change would induce people to structure the experience over time. Some of the others were not predicted in advance, for example the effect that the perceived time it takes for the kettle to boil would have on its interpretation and the perception of time in the experience.

5.3.3 Specific Kettle Prototypes

Though some of these markers of narrativity were seen throughout the interviews about the kettle prototypes, there were some markers that were particularly associated with one kettle prototype as opposed to others. These will be briefly broken down below.

K1 – Secretary Kettle

This kettle prototype engendered a lot of reflection, as well as delight and emotion. The reflection was partly about the kettle changing appearance over time, as well as

reflecting on how this is achieved, technically. It was also partly due to the fact that some participants didn't notice it changing, which led them to questioning their own perception of themselves or the setup of the testing session.

> **Interviewer: So, you didn't notice before that it had changed the...**
> Interviewee: No, I didn't. [...]
> Interviewee: In fact, I don't believe it did! You swapped them when I wasn't looking!
> **Interviewer: [Laughter]**
> Interviewee: No, I didn't notice. I just made the impression of it and didn't really bother to look, I suppose. **K1and2Tim**

Participants also associated certain concepts to the kettle, which sparked further reflection.

> it sparked the idea of making a tea is always comforting I think. It always relates to relaxing, chilling, if someone offers you a tea then you're oh, thanks. It just kind of adds that home element to it, weirdly. **K1and2Gr1**

Participants were also delighted by the kettle, both by the surprise in seeing it change, but also by the pattern itself and the experience of watching it change appearance.

> it was a nice surprise to see it change ... change appearance!
> **Interviewer: You did have quite a reaction! K1and2Gwen**

> Yeah, I quite enjoyed that actually. Yeah. **K1and2Tim**

> I think that's quite cool, the pattern **K1and2Gr3**

K2 – Tale of Two Sisters Kettle

Participants perceived this kettle as having agency, in line with the brief, which was to imbue a ghost-like agency in the kettle.

> it does its job, like it lets you know. **K1and2Gr1**

> it's like it's almost giving like too much feedback. So like "I'm ready to come off! I'm ready to come off!" instead of just the ping, like a

flick

R: yeah

P4: electric which is why I can't understand why it's doing that. Because it's like 'Come on, pot or blows, get off like". It's so annoying, like. It would just really irritate me, like. It's not pleasing at all to hear that, like [laughter] **K1and2Gr1 (K2)**

I'd just be standing by it, but I'd placed all of my responsibility in the kettle, whereas now it was like a mad machine interaction! **K1and2Jules (K2)**

it sounds like something's banging against the inside of it. **K1and2Gr4 (K2)**

What was less expected, was that this prototype would strongly evoke memories, storyworlds and associated stories in the participants. This was mostly in relation to the sound of the kettle, which appeared to be particularly effective at prompting this sort of reaction.

Storyworlds were evoked through associating the sound to another sound, which brought up a mental image of a different place.

Its making rather an annoying noise… It reminds me of something … air conditioning unit. Some air conditioning units make that noise. Bad ones in cheap hotels in Ibiza or elsewhere! **K1and2Tim (K2)**

It sounds like when you're in your room and there's rain falling outside. It's exactly the same noise. **K1and2Gr2 (K2)**

Memories were also related to storyworlds, in that they also can suggest a mental image of a different place:

Interviewee: Yeah, I mean, I suppose I would have never made the tea probably back in those days; I wouldn't have been responsible for boiling the kettle when I was at home and we only had a kettle that you boiled on the stove, so I'd have either been present but invariably it would have been my mum who was there boiling it, so I may or may not have been present for the whole process but if I was, I'd be standing by her side, so then I can have a visualisation of that stove,

of that scene, of being there with her, because it's something that I probably haven't done since right back then.

Interviewer: Yeah, yeah.

Interviewee: So that comes through quite strongly. Probably the mere fact that I haven't done it since make that somewhat stronger. **K1and2Jules (K2)**

The interpretation of this kettle prototype was less through a process of reflection, and more through a process of association and associated stories (T1.1), and again these seem to be prompted primarily by the sound of the kettle

TM: do those things whistle?

R: that one doesn't.

P3: not a whistling kettle

TM: my grandma's actually whistles.

P5: it must be like [unint] the whistling [unint]

[unint]

TM: I could hear it from anywhere in my house, like the whistle would be...

P3: Do you like the idea of it?

TM: like an alarm, or like an oven that keeps beeping. [unint]

P3: yeah **K1and2Gr4 (K2)**

P5: yeah it doesn't sound like boiling water to me.

TM: boiling water is like whooooh

[unint]

R: what does it sound like?

TM: it sounds like something's banging against the inside of it.

P3: yeah. It doesn't sound like how I would imagine a kettle would sound like.

P5: sometimes there's these [unint]

P3: like a cracker or something **K1and2Gr4 (K2)**

K3 – Wristcutters Kettle

This kettle prompted less memories than the other kettle prototypes, but participants interpreted as having agency, and in particular had empathy for it. This

was in part due to the fact that this kettle had the clearest "characters" in the form of the fish, and the characters prompted this response.

The quotes below show how the participants assigned agency to the fish in the kettle prototype, by describing them as starting to dance and flapping around:

> I turned it on with the switch and it lit up which was pretty cool, and it has, I'm assuming they are supposed to look like fish? And they like started dancing when it was boiling **K3and4Lucy**

> I thought they'd start going around when it'd boiled, but they just started flapping around before they did, and they only flapped around only in the last 10 seconds. **K3Gr2**

And how assigning agency and seeing the fish as characters also prompted the participants to empathise with the fish

> **You said something about the fish being boiled?**
> Yeah, I feel so bad! **(K3and4Cindy) (K3)**

> **I like the fact that you asked me if they were alive before!**
> *[Laughter]*
> I saw them at the bottom and wanted to be sure I wasn't making fish soup! **K3and4Maya**

> They're dying! [Laughter] **K3Gr2**

> It's a bit sad really because like, if you actually boiled fish…
> [Laughter]
> …it could be like global warming…
> **Yeah.**
> We are boiling our fish!
> [Laughter]
> Global warming?
> Yeah, because they look really sad now that the water's gone. **K3Gr4**

The kettle also clearly delighted the participants

> **What were you thinking as you were making tea?**
> About the fishes in the second one!
> *[Laughter]*

I think that was the most interesting…

Okay.

…and when the water started boiling they start going up which is nice. Yeah. **K3and4Maya**

That looks so good! I know so many people who would love that. Are you going to make them to sell? Is that… **K3Gr2**

To note, this kettle structured the experience over time for a lot of participants, and did this by having details that were noticed at different moments, such as noticing that the pieces of wood inside the kettle were shaped like fish, as well as by setting up and confirming or breaking expectations of how the fish would behave though boiling. This process is what Bordwell describes as the process through which film viewers interpret films, and is described in Chapter 2, in particular Section 2.4, p. 73 (Bordwell, 1985). This process is shown in the quotes below:

At first I thought they were teabags, not fish. **K3Gr3**

I realised there was something in there, but I didn't realise it was fish until it started swimming and I was like yeah, that's a fish, but it's nice! **K3Gr1**

and when the water started boiling they start going up which is nice. **K3and4Maya**

I guess you are more engaged because you are waiting for them to do something.
Yeah, the fish were, the fish floating was definitely at a lot of a later stage than I thought it was going to be, and they seemed like it went from, like when you could see them just start to tip up to then go full tilt was really short, I thought that would be a longer process. **K3Gr2**

I thought they were nuts as well first because of the colour and the shape and then I had a closer look and saw it was fish, but I was surprised too that they started actually floating pretty late, but then it's an indicator of water boiling when it reaches the temperature, it's something visual that you see.
I really like it to look at it, it's really unique. I've never seen it before. Really playful, when you see the fish in the beginning, they

don't move, and you think okay, what will they do, and then realise the movement as it develops to high speed when it boils, yeah, when the water is warm. **K3Gr2**

K4 – Vera Drake Kettle

As mentioned in Section 4.3.4 (p. 185), this was a very difficult kettle for me to design, so I was not expecting a great result from testing it. In general, the reaction was quite low, but this could be because it was tested together with Kettle 3, which was much more obviously engaging. There were however a few interesting characteristics to how the participants retold their interaction with this kettle.

The kettle prototype sparked some good reflection in participants. For example, Cindy reflected on why she did not notice the kettle changing colour:

> I think also because like I think because the colour is on the diameter of the kettle, if it's on top of the kettle I think I would notice it.
> So, you don't see it from the side?
> No. **K3and4Cindy**

While other participants picked up on the fact that this kettle did not turn itself off, and was generally very quiet in its operation, so it didn't really give many clues to whether the water had boiled or was soon to boil:

> So, I've plugged it in, I just let it sit, I didn't really know what was going to happen when the kettle was done, I got the tea bag out and put it in the mug and as it got warmer it changed colour and so I guessed when all of the colour had gone that means it was boiled. I did also see steam though, so that was like, I definitely knew then. **K3and4Lucy**

> I guess it did made me think. **K3and4Lucy**

> I think with this kettle you have to pay more attention to it, I think because other kettles are more sound feedback, and this one visual, so you had to actually pay attention because I go, turn around, is it done, but normally you'd hear it, there is a build up, so it was very … you had to pay attention to it, whereas other ones was, I don't know,

I found the other ones easier because you can, with sound you can do other things. **K4Gr1**

This kettle also prompted negative emotions in the participants. This was surprising for me because even though the starting point for the kettle was the idea of a kettle that appears dangerous at first sight, but then changes its character to caring, I wasn't expecting participants to pick up on the danger element so much. While none of the participants actually mentioned associating the diagonal red stripes with a symbol of danger explicitly, the idea of danger was conveyed somehow by the kettle:

So, the one that looks like it should be on the stove, but it's electrical, it's nice, it's not as noisy, but the things is because it's like … there is no automatic clicker or something, I have to time it. Yeah, it makes me more impatient because I don't know when is a good sign. **K3and4Cindy (K4)**

I find it so scary.
Really?
I think it's so scary.
Yeah, I'm always scared of those kettles which **[inaudible 00:25:30]** and I'm scared that it's going to just like, you know, the very, very old-fashioned ones, they are not electronic, you put them on a gas and then you pop the lid on and a cap and it whistles, that's why they whistle because of that cap, I'm always scared it's just going to, the water is, the steam will just like knock that…
Make it come out?
…Yeah, off the cap. **(K4Gr1)**

5.4 Conclusions and insights

5.4.1 Limitations

It is important to acknowledge the limitations of the testing method used for these kettle prototypes. Because the test and the interview were conducted in "lab" conditions, the atmosphere was more awkward for the participant than it would have been in a regular setting. However, every effort was made to mitigate this through the room setup and the style of conversation, as well as the provision of tea and cake or biscuits, and the informal interview style.

The comparison between the different interview topics within the same setting however provides some indications about how these prototypes would be interpreted in other settings as well.

Throughout the research, it was difficult to resist the urge to "measure" the "amount" of narrativity that is present in the different prototypes as opposed to regular kettles. This was discarded as an approach because it would bring the research into a different domain, that described by Koskinen, Binder and Redström as a "lab" approach (Koskinen, Binder and Redström, 2008). Though the setting of the testing was lab-like, the methodological approach of this research falls outside of this tradition, so a quantitative analysis would not be appropriate. For a more detailed rationale on this choice, see Section 3.1 (p. 89).

As a consequence, testing was set up to avoid this pitfall; the interviews were conducted in a semi-structured manner, and were not timed in order to compare quantitative data. The kettle prototypes were not tested against a standard kettle in the same lab-like conditions, and the only data that was used in the analysis were the transcripts of the interviews, which forced me to focus on the participants' interpretation of the experience as opposed to my observations about the ways in which they used the kettle prototypes.

The analysis was therefore conducted not to "measure" the "amount" of narrativity in the interview, but rather to assess the qualities of the stories told by the participants about the kettle interactions. This provided rich qualitative data that could be interpreted and compared with the discussion about their own kettles. To analyse this, the focus was on markers of narrativity that are specific to narratives related to products, deriving from the frameworks used in the literature review, the practice review and the key concepts described in the literature review [narrative

elements coming from the Practice Review as Narrative Functions (NF), (in Section 1.1, p. 35) and Typology Categories (T) (Section 1.2, p. 42) and Keywords (K) coming from the key concepts analysed in the Literature Review (in particular Section 2.4, p. 73)].

It is important to note that the analysis is subjective, and relies on the researcher's interpretation of both the abstract concepts described by the narrativity markers, as well as the interview material.

5.4.2 Findings

There were marked differences between the ways in which participants spoke about their own kettles, or kettles they owned in the past, and the ways in which they spoke about the kettle prototypes. In addition, there were marked differences in the ways in which participants interpreted their experiences with the different kettle prototypes.

Some of these differences were to be expected, while others were either unexpected or more marked than initially thought.

Emotion was one of those markers that was found in a way that was coherent with prior expectations. Participants' own kettles were described either in an indifferent way, or with associated emotions that were related to past memories of people or events that involved the kettle, and only rarely was the design of the kettle mentioned as a source of emotion. The Kettle Prototypes prompted immediate emotional reactions, ranging from delight to fear. In addition, the Kettle Prototypes prompted emotions based on their associations, either through form or through behaviour. Each Kettle Prototype also evoked different emotions, in a way that roughly followed the intent in the original brief.

Identity was found, as expected, primarily in relation to participants' own kettles either through purchasing decisions relating to character or through highlighting habits and quirks of use. Though less prominent, identity also featured in the kettle prototypes, often as a way of explaining how the participant used the kettle, and in what way this might be in line with or contrasting with their habits. This was present as well in the discussion of people's own kettles in relation to values (NF3).

Reflection (NF2) was not seen much in relation to participants' own kettles, but it was present in relation to the different Kettle Prototypes. Different prototypes prompted reflection in different ways, either by gradually changing over the time of the boil, and providing a focus for reflection or confounding expectations, or by behaving in an unexpected way, for example not signalling when the water is approaching boiling or has boiled. The prototypes also prompted reflection as participants compared them to kettles they used in the past.

Agency was particularly relevant to the prototype kettles. Prototype Kettles were assigned human dialogue, human emotions and were empathised with. They were also seen as entering into a dialogue with the participant, for example one kettle was perceived as calling out annoyingly to be taken off the fire. One kettle created a different type of agency by having recognisable characters, fish, who then were described as dancing, dying, or flapping around. The participants also felt empathy for the fish characters (NF4).

Memory (also NF6 – remember) was seen mainly through association, and in particular the kettle's sound seemed a really strong way to evoke memories in the participants. The sound of one kettle prototype also evoked storyworlds, both remembered and imagined, and provided a strong association to a whole series of different situations and settings.

As expected, the kettle prototypes delighted the participants (NF 7), while their own kettles occasionally delighted but mainly were seen with indifference. This however could also be attributed to the novelty of the kettle prototypes and they would have to be tested over a longer span of time to assess whether the novelty would wear out or if the delight is sustained.

When looked at through the Typology of Narrative Use described in Section 1.2 (p. 42) the participants didn't describe their own kettles as activating any associated (T1.1) or imagined stories (T1.2), nor did they refer to accompanying external narratives (T3.1) or to the kettles structuring the experience over time (T3.2). This might have to do with the limitations of the testing methods in relation to how the conversation was structured around participants' kettles, and could be something that is explored in further studies. The kettle prototypes however showed both the activation of associated stories (T1.1), through features of the design or the behaviour of the kettle, as well as the facilitation of story imagining (T1.2) through evoking storyworld and reflective interpretations. While associated stories did not feature (T3.1) the kettle prototypes were described as successfully structuring the

experience over time (T3.2), through either a change in the kettle's appearance, a change in the way the kettle or elements of the kettle behaved over time, confirming or contrasting initial expectations, or through appearing to prolong the time of the interaction.

Some of the markers of narrativity featured less prominently or not at all in the conversation. NF1 Conveying Information and NF5 Creativity were both present occasionally in the prototype kettles but did not feature heavily in the conversation. NF8 Persuade and NF9 Cohesion were not used as codes, though it could be argued that the instances of structuring experience over time could loosely fall into a cohesion category, as is provides narrative cohesion.

One notable finding was that the interviews about the kettle prototypes displayed narrativity markers that were distinct from the participants' own kettles, and each prototype displayed different combinations of markers of narrativity, roughly, but not exactly, in line with the intentions of the individual briefs. While narrativity about own kettles focussed mostly on symbolic value in terms of identity or emotional attachment because of shared experiences, the narrativity present in the prototypes was wider in scope and directly prompted by features designed into the prototype itself. This confirms that the research question and hypothesis that narrativity can be intentionally designed into products through particular design practice methods, and using film as a source material.

5.4.3 Contributions to the Knowledge

Contributions to the knowledge from this chapter are primarily related to the testing and analysis methods applied. In the literature, there isn't a framework for testing products for narrativity nor one for analysing product experiences in terms of narrativity. The contributions to the knowledge from this chapter are therefore:

- **The testing methods**, to test prototypes for narrativity with participants and elicit qualitative narrative data from a product experience.
- **The analysis methods,** to analyse interview transcripts about product experiences through "markers of narrativity", to assess the quality of the narrative that the products elicit.

Chapter 6 – Discussion and Insights

6.1 Conclusions and insights from each chapter

This section presents a summary of the conclusions and insight sections for each chapter.

6.1.1 Conclusions and Insights from the Practice Review

The practice review analysed a number of examples of products and design processes which have been interpreted in the literature or described by their designers to be in some way narrative. This review is presented through two classifications: Narrative Functions classifies the design examples based on why narrative is used in the design outcomes or in the design process; Typology of Narrative Use is a classification based on whether the user and/or the designer create or experience the narrative, whether the narrative is used in the design process or in the product experience, and whether the narrative manifests itself embedded into the product (internal), or externally through an accompanying narrative.

These classifications are valuable to this research because they make it possible to define with precision the types of narrative use that will be within the scope and outside the scope of this study, and consequently also help to define a gap in knowledge. The gap identified refers to research into using design methods to structure the user's product experience over time as a narrative. This gap in knowledge and practice was recognised as one of the prompts for this study, and through the classification above it was validated as an appropriate area of investigation.

These two classifications inform the generative design methods for the practice-based aspects of the study, mapping directly onto the categories used in the generative design process. The classification is used as a starting point for generating and manipulating design concepts, and is incorporated into the Narratives in Design Toolkit. In addition, they inform the qualitative analysis of the product prototypes, by providing some of the markers of narrativity that can be used to assess the participants' accounts of the product experiences in terms of narrativity.

As a consequence, the classifications also provide a framework for other designers to define the scope of design projects that involve narrative, and to clearly define how narrative contributes to their design process or outcomes.

6.1.2 Conclusions and Insights from the Literature Review

The Literature Review grounds the study in cognitive narratology, therefore focusing on the effects of the narrative qualities of the product on the user's interpretation, memory and retelling of the product experience. This research uses a cognitive narratology approach to formulate why narrative is relevant to product design and what the effect of using narratives can be on the product experience. In particular, cognitive narratology led to the concept of tellability, the quality of products that can foster narrativity in product experiences. This research also uses cognitive narratology to account for the process of story creation and interpretation that takes place in the user during and after the product experience, and explains why the product can direct but not dictate the narrative ways in which a user might experience it.

The main insight from the Literature Review is also one of the contributions to the knowledge of this research: the concept of tellability as applied to products. Tellability is used as a key concept in the design process as well as in the testing and analysis phases of this research because it frames products as a narrative medium, containing the *potential* to elicit narrative responses in users, and helps designers consider how elements of their design could elicit a narrative response. This implies that narrative responses can be designed for and considered as part of the product experience, and presupposes the link between qualities of the product and the ways in which these qualities may direct the user towards certain types of narrative interpretations.

Tellability establishes narrative as a scalar quality of a product, and provides a language for designers and design researchers to consider the ways in which particular products or details of products are affecting the interpretation, memory and retelling of their product experience. Though every product that is interacted with creates an experience that is interpreted, remembered and retold in narrative form, some of these experience narratives are more memorable, engaging and interesting than others. In other words, some of these experience narratives contain more, or different types of narrativity.

In order to analyse and assess the tellability of the product and the narrativity of the product experience, some of the key concepts described in the Literature Review are used to identify those narrative elements that may contribute to the tellability of products. These are described through the Framework of Narrative Product Experience.

The Framework of Narrative Product Experience positions the narrative experience at the centre of the product experience, with time as a focus of the interpretation. This conceptualises time as a central element of the product experience, which is reflected in the design process and methodology, and helps to define the time span this research focusses on, that of a single use interaction experience.

The narratology literature is reviewed to identify definitions of "what narrative is" and what the elements that constitute a narrative are, and this is then synthesised into five Definitions of Narrative, going from the most minimal to the one requiring the most elements. The Definitions of Narrative qualify different types of narrative that might be present in design, and the elements that constitute these, and are meant to be simple enough for designers to be able to use in a design process, while not losing sight of the complexity of the subject. Within this research, the Definitions of Narrative are used in the Narratives in Design Toolkit as well as in the design process to design narrativity into a product experience. The Definitions of Narrative are also divided into their component parts as a way to prompt design concepts.

The extrapolation of key concepts related to narrative within product experiences informs the ways in which designers can create and analyse these experiences. Key concepts related to narrative, such as emotion, identity, agency, memory, and storyworld, are used in this research in the analysis of the test data and referred to as "markers of narrativity".

6.1.3 Conclusions and Insights from the Methodology

Narrative Theory has not been applied in this way to Product Design, so the research methodology was designed and adapted as the research progressed. Two areas in particular provide a contribution to the knowledge:

The methods for incorporating narrative elements into the design practice, focussing on the narrativity of the designed product. This includes the methods that are codified into the Narratives in Design Toolkit, as well as the description of the design process in this research, showing how elements from films are applied to product design.

The methods for collecting and qualitatively analysing test data to build a picture of the narrativity of the product experience. These were formulated throughout the process of the research because a viable template for testing and narrative analysis of test data for products was not in existence. The Literature and Practice Reviews made it possible to focus the analysis of the testing on markers of narrativity, using specified categories and keywords. This created a method that could easily compare the qualitative aspects of the stories told in the participant interviews about the product experiences.

6.1.4 Conclusions and Insights from the Design Practice

The Design Practice chapter describes the development of the practical applications of the theory and frameworks into the design process. In particular, the generative stages of the design process as well as the speculative design practices show how elements from narrative theory could be incorporated into designed products, and what value these could bring to designers within the design process. In addition, the Design Practice chapter provides a way to communicate these design methods to designers and design students through the Narratives in Design Toolkit.

This chapter contributes to the knowledge in the following areas:

The Narratives in Design Toolkit provides a tool for designers to use narratives in design work, and make it easier for designers to focus on elements of narrative theory within the design process. Though narratives have been extensively used in design, there is a lack of uniformity in how narrative terms are used in design, and this can lead to misunderstandings in terms of what is considered to be narrative within a design or within the design process, the presentation of the product or the user experience. The Narratives in Design Toolkit provides a narrative-based language for designers.

The design methods shown in Case Study 1 and Case Study 2, and codified in the Narratives in Design Toolkit, show a way in which elements of narrative theory can be used by designers to design products focusing on the narrative aspects of the experience narrative that the products elicit in the user. Designers can use these methods in order to design more tellable objects (using the Toolkit) resulting in product experiences with more narrativity.

The specific methods that lead from film examples to briefs for kettle design could also be followed as a model or adapted in other projects. This would involve not only using the Narratives in Design Toolkit, but also analysing films to come up with briefs and material for speculative design projects.

The practice-based outcomes of the study, Kettles 1, 2, 3 and 4, can be used as examples of how to use the design methods and what effects these may obtain. These are not the main contributions to the knowledge, nor the main outcomes of the research; they function as research objects and as examples of how this process could be followed and to what effect.

6.1.5 Conclusions and Insights from Testing and Qualitative Analysis

Contributions to the knowledge from this chapter are primarily related to the testing and analysis methods applied. There is no framework in the literature for testing products for narrativity nor one for analysing product experiences in terms of narrativity. The contributions to the knowledge from this chapter are therefore:

The testing methods: to test prototypes for narrativity with participants and elicit qualitative narrative data from a product experience. These include the ways in which a prototype can be tested in a "lab-like" setting but focussing on qualitative and narrative aspects, and how a semi-structured interview method can be used to elicit these responses.

The methods of analysis: to analyse interview transcripts about product experiences through "markers of narrativity", to assess the qualities of the narrative that the products elicit. Focussing on the transcripts of the interviews, directs the researcher's attention to the users' interpretation of the product experience as retold in their own voice. The template approach to qualitative analysis, and the use of specific codes that relate to these markers of narrativity, allows the researcher to consider the interviews from a narrative perspective.

6.2 Findings, Validity and Limitations of the Research

The research question driving this research is whether design can enhance the user's experience of interacting with an everyday non-digital product through the application of narrative elements derived from film (Section 3.0.1, p. 85). To investigate this question, key concepts were used from different disciplines, and these concepts were used to inform a series of "narrative elements" that designers can use in the design process or in the assessment of design work. These elements can work as prompts within a generative design phase.

The narrative elements identified through the research can be grouped into two different sets. One set of narrative elements derives from analysing the narratology literature looking for definitions of the minimum requirements for something to be defined as a narrative. This is described in Section 2.3 What is Narrative? Definitions of Narrative for Designers (p. 67), and incorporated into the Design Process Matrix (Figure 24, p. 108). These elements are events, representation, structured progression, chronology, character/entity, cause and effect, agency, affect, value, conflict, climax, change, coherence, equilibrium, closure, not fully predictable behaviour, hero, antagonist, and motivation.

Another set of narrative elements is derived from the analysis of key concepts in narratology used to frame the central concepts of this research. These key concepts are used as codes for analysis of the interview transcripts, as described in Table 5 (p. 118). These elements are emotion, agency, identity, habit, anecdote, storyworld, and memory. Designers can use these elements to prompt their thinking and focus on how some of these elements might come through in the stories that the user forms by interpreting and retelling the interaction with the product. In particular, when following a design process that has a starting point in another narrative medium, for example film, then elements such as characters, storyworlds, values can be directly inspired or translated from the original narrative into the design of the product. This can be done by for example translating elements of a character's personality or role in the film into visual elements in the design of the product, or behaviours of the product when interacted with.

The research has confirmed the initial hypothesis (Section 3.0.2, p.86), that designers can harness narrative elements from other mediums in order to create products that direct the user experience towards an enhanced narrative

interpretation, through a series of intermediate steps. The Literature Review in Chapter 2 (p. 51) provided a framework for looking at product experiences as narrative experiences. Product experiences were put in relation to their narrative interpretation, drawing upon the literature on product experience, interaction design and experience design, as well as the literature on cognitive narratology. The focus is on the narrative that the user creates when interacting with a product, either in terms of in-the-moment interpretation, or in terms of memory or retelling of the experience. A classification of the ways in which narrative is already used in design in Chapter 1 (p. 31) validated a gap in knowledge about using narrative as a way to structure the product experience as well as providing a framework for differentiating the ways in which narrative can contribute to the design process.

Methods for analysing films and creating design briefs based on the content of the film, as well as methods for designing for narrativity in the product experience were developed and described in Chapter 3 (p. 84) and Chapter 4 (p. 123). These help designers to harness narrative elements from another narrative medium, in this case film, focussing on the content of the film and the role the product plays in that film, to inject the designed product with narrative meaning. In addition, the Narratives in Design Toolkit (Section 4.2, p. 146 and Section 4.4, p. 191) assists designers in focusing on the narrative structures, sequences of events and narrative qualities that might be designed into the user experience of the product. These methods support designers in designing for narrativity of the product experience, or to design products that are more tellable.

Finally, the designed prototypes were tested with users (Section 5.1, p. 195) and the results were qualitatively analysed, analysing the users' accounts of the product experience for "markers of narrativity", to determine what types of narratives were prompted by the different prototypes (Sections 5.2, p. 204 and Section 5.3, p. 209). The prototypes were found to activate different types of narratives than those elicited by the users' own products; the participant accounts showed the users engaged with the prototypes and created product narratives that were sparked by associations with the prototypes, brought up memories and storyworlds, engaged emotionally as a response to the interactions, and assigned agency to the prototypes. In addition, the prototypes were found to "direct" or structure the user experience over the time of the interaction.

The research question began by looking at whether narrative theory can help designers to enhance the user's product experience, and then moved to analysing

how narrative and narrative theory can help designers to enhance this experience. This is addressed in two ways. The research can help designers articulate how they can use narrative principles to envision and design product experiences over time as a coherent narrative, fostering particular interpretations in the user through the sequence of events that happens in the use of the product. In addition, the tools and methods can help designers to design for a narrative experience, both in the sense of structuring the experience over time as a narrative, but also in terms of using narrative content in the design, through the Narratives in Design Toolkit as well as the methods used to arrive at the design briefs from the films.

The research revealed that using narrative as a framing concept during the design process can be a valuable way to envision how a product experience unfolds over time, and can be a way of articulating how design can be interpreted over the time of the product experience. The role of narrative as a way of interpreting the user experience with a non-digital product has been under-represented within design research. This approach requires the analysis of a product experience over time, and how the interpretation of this might be governed by narrative principles. Several researchers have indicated there is a need for this approach, mostly within an interaction design or HCI environment, and thus primarily referring to digital products. Djajadiningrat outlined the need to look at interaction as a process that unfolds over time (Djajadiningrat, Gaver and Fres, 2000; Löwgren, 2009); Löwgren analysed interaction design in terms of dramaturgy (Löwgren, 2009).

Forlizzi and Ford talk about "experience as story" (Forlizzi and Ford, 2000, p.420) and underline the fact that there has been a growing interest in the user experience, but "very little has been done to demystify the idea of 'designing the user experience' and how interaction design and product design achieve specific user experience goals" (Forlizzi and Ford, 2000, p.419). Despite this research within the design fields on the user experience and its relationship to narrative, and the interest in the subject from a theoretical point of view, not many studies have moved from the theory of experience as narrative to documenting methods for designing narrative specifically into the user experience.

It is important to note that this is not advocated as an exclusive approach to design, but as one of a series of methods that can be used by designers to address the product experience. This research identifies with the Design Studies tradition (Fallman, 2008) applying theory from another field, developing design prototypes, then testing these and articulating principles that can be used by other designers.

The applicability of the research and the transparency of the design process are fundamental to this research. It is important to this study that the theoretical outcomes are grounded in design theory – what Nigel Cross defines as "designerly" ways of knowing – and more specifically "design praxiology" as the theory of design practice (Cross, 1999).

The designs deriving from this study are situated within the context of speculative or research design work outside of major commercial brands and outside of the constraints of mass production (Auger, 2013; Dunne, 2013; Malpass, 2013). However, this does not mean that the design methods deriving from this study would not be applicable and valuable within different design contexts. Gaining an understanding of the ways in which designers can make their products more tellable is valuable to product designers within a wide range of contexts as tellability is connected with memory of the experience, recall and word-of-mouth. Ways in which these findings could be applied to other design fields will be discussed in more detail in Chapter 7 (p. 258).

6.2.1 Practice and Literature Review

The findings of the Practice and Literature Review can be synthesised in the conceptual frameworks for the research. In particular, the Narrative Functions (Section 1.1, p. 35) and Typology of Narrative Use (Section 1.2, p. 42) describe ways in which narrative has been used in design and they identify a gap in the knowledge, while the Definitions of Narrative for Designers (Section 2.3, p. 67) synthesise elements of narrative that designers can use in the design process. The Framework of Narrative Product Experience (Section 2.2, p. 55) establishes parameters that contribute to the narrative interpretation of the product experience. Sections 2.4 (p. 73) and Section 2.5 (p.79) establish the concept of tellability as a product quality that can lead to narrativity in the product experience, and outline the key concepts for narrative within product experience that are then used as "markers of narrativity" in the qualitative analysis (Chapter 5, p.195).

The conceptual frameworks were validated through a series of peer-reviewed conference papers and book chapters (Grimaldi, 2013, 2015; Grimaldi, Fokkinga and Ocnarescu, 2013) as well as through a series of workshops to devise and test the Narratives in Design Toolkit (Sections 4.2, p. 146 and Section 4.4, p. 191).

The frameworks, in particular the Narrative Functions, Typology of Narrative Use in Design and the Definitions of Narrative for Designers have their limitations; these are mechanical methods of analysis that are not holistic, and design artefacts and product experiences don't fall neatly into categories; interpretations and experiences are multi-layered and messy. The frameworks are good at breaking elements down and making clear distinctions between qualities of the products, but these might be overly cumbersome for experienced designers, who can see these qualities in an implicit way.

Nonetheless, there is value in providing a tool that allows for conversations around a product to focus on particular aspects of the product experience, and makes it possible to differentiate elements and effects. Though designers might address these implicitly, it is also useful to be able to look at these elements individually. To account for the multi-layered narratives, product experiences were analysed though the "markers of narrativity" approach (Chapter 5, p.195) instead of categorising these experiences rigidly into one or another category.

A limitation of the study was found to be that the categories in Narrative Functions, Typology of Narrative Use in Design and the Definitions of Narrative for Designers were too difficult to grasp without a lengthy introduction. As a consequence, these frameworks were simplified in the Narratives in Design Toolkit (Sections 4.2, p. 146 and Section 4.4, p. 191), though an iterative design process. The final iteration was found much easier to grasp and use instinctively by design students, while still allowing them to focus in the same way on the elements that make the design narrative. In addition, when testing, the Toolkit was found to facilitate the discussion of the narrative in the design; students found it complex but very useful.

6.2.2 Methodology and Design Practice

The research question was the starting point for building the methodology (explained in detail in Section 3.0.1, p. 85). The question "Can design enhance the user's experience of interacting with a non-digital product through the application of narrative elements derived from film?" implies a number of research methods and fields of investigation. Frameworks were built from research into the fields of user experience, interaction and product design, and narrative theory, and these frameworks then informed the design practice. Field research was conducted in the traditions of design ethnography, using narrative methods whenever possible.

Design practice was conducted using iterative action research and reflective practice, in particular to highlight design praxeology, or research into the process of designing (Cross, 2007). Testing was conducted using qualitative narrative methods, and analysed using a narrative frame.

The methods used through the design process allowed for many design concepts to be created quickly (Section 4.1.5, p. 142) and focussed the design process around the narrative qualities of the product experience (Sections 4.1.5 p. 142 and Section 4.3.5, p. 190). The Narratives in Design Toolkit allowed for the methods to be codified as both analytical and also generative tools (Section 4.2.1, p. 153 and Section 4.2.2, p. 158). These encourage the designer to envision and engage with the user experience of their design, as well as with the user's interpretation of that product experience. The toolkit reinforces the idea that all details of the design communicate in a narrative way to the user, and helps to focus design choices in terms of narrative (Section 4.2.5, p. 171). It also allows designers to focus on the time-based aspects of the user experience and the tellability designed into this experience (Section 4.4, p. 191).

The methodology was also validated through a series of peer-reviewed conference papers, journal papers, and book chapters (Grimaldi, 2012, 2013, 2015; Grimaldi, Fokkinga and Ocnarescu, 2013) and through a series of workshops to devise and test the Narratives in Design Toolkit (Sections 4.2, p. 146 and Section 4.4, p. 191).

In addition, testing and analysis of the design prototypes (Chapter 5, p. 195), confirmed that the design methods had the intended effects (Section 5.4.2, p. 231). One notable finding was that the interviews about the design prototypes displayed narrativity markers that were distinct from the markers shown when participants discussed their own products, and each prototype displayed different combinations of markers of narrativity, roughly, but not exactly, in line with the intentions of the individual briefs. While the narratives about their own products focussed mostly on the symbolic value in terms of identity or emotional attachment because of shared experiences, the narratives present in the prototypes were wider in scope and directly prompted by features designed into the prototype itself. This confirms the research question and hypothesis that narrativity can be intentionally designed into products through particular design practice methods, and that film can be used as source material.

The Narratives in Design Toolkit was designed, tested and iterated with groups of design students, which confirmed its validity as an analytic and generative tool to

focus on the narrativity of the product experience (Section 4.2.5, p. 171). The second iteration of the Toolkit was only tested through the design practice within Case Study 2 (Section 4.3, p. 173), which constitutes a limitation of this second iteration. However, within this single Case Study, the toolkit was found to facilitate thinking about the sequences of events and designing for these (Section 4.3.5, p. 190 and Section 4.4, p. 191). The second version of the Toolkit uses the same cards as version 1, but adds the element of time, and as such it has been at least partially tested by testing version 1 (Section 4.2.5, p. 171). A test and application of the second version of the Narratives in Design Toolkit could be the basis of a further research project, in particular analysing its pedagogic applications (Section 7.2, p. 276).

6.2.3 Testing and Analysis

In the testing interviews, participants spoke about the product experience with the design prototypes in a very different way from the way they spoke about their own products. This points towards a different type of interpretation and narrativity, prompted by the prototypes themselves. While some of the markers of narrativity were found to be present in the two types of accounts, for example emotion, this was discussed differently when in relation to their own products or the design prototypes. The prototypes prompted immediate emotional reactions and associations, as opposed to associated emotions based on past experience with the product. Some markers, such as identity, were found primarily with the participants' own products, while others, such as reflection, agency and memory, were prompted primarily by the design prototypes. The design prototypes were found to prompt associated stories as well as imagined stories, and were found to structure the product experience over time. In addition, the users' interpretations of the individual prototypes were roughly in line with the intentions of the different briefs, for example the kettle based on the horror film "A Tale of Two Sisters" prompted unease in some participants and the need for many participants to keep checking on it and keep it in their immediate field of attention. The kettle based on the black comedy "Wristcutters: A Love Story", caused some participants to be delighted, and others to empathise with the kettle (Section 5.4.2, p. 231).

It is important to acknowledge the limitations of the testing method used for these prototypes. Firstly, there are limitations and ethical implications to using students as participants in the research; students were used in three out of the four sets of

testing sessions, and these limitations and ethical implications were mitigated in different ways depending on the testing session.

Referring to Table 4, (p. 115), three sets of testing sessions constituted part of the qualitative analysis of participants' experiences with the prototypes and their experiences with their own kettles. These were

- <u>First session</u>: carried out with undergraduate design students on my course, asking them to film themselves using their kettle at home, then interviewing about their own kettle with and without watching the video, and then creating a storyboard.
- <u>Individual testing sessions</u> (testing session 1 and 2): these were carried out with participants recruited externally through social media and leaflet drops, and involved bringing a photo of their own kettle, using the kettle prototypes, and being interviewed about their own kettles and the kettle prototypes.
- <u>Group testing sessions</u> (experience-centred design students): carried out with undergraduate second year students at the college where I teach, and involved using the kettle prototypes, a group interview about their own kettles as well as the prototypes, and a storyboarding exercise which wasn't used in the analysis.

An additional set of testing sessions was carried out to test the toolkit (Table 8, p. 151).

- <u>Toolkit testing workshops</u>: These were carried out with mainly postgraduate students from a range of different courses, and involved using the toolkit at different stages of design.

Each session that involved students had its own particular limitations and ethical implications. The first session was initially only meant to test different methods to use, therefore I used a sample of convenience by asking my students to volunteer. However, the data that came from it was rich and valuable and it was agreed with the supervisory team that this data should be included. There are obviously ethical implications in using my own students, however, these sessions were not about my prototypes, but about their own kettles they used at home. The students were third years at the time and I made it very clear that this was my own project, completely

separate from the course. Because they were not asked to "pass judgement" on my own work, the ethical implications of the student-tutor power dynamic were less problematic, and there was less chance of confirmation bias.

The group testing sessions involved second year students on an experience-centred design unit that was taught by another lecturer. I was brought into one of the session as an outsider that was going to run a workshop and then give a lecture. Because these students were going to be testing my own work, the mitigating the power dynamic between tutor and student was more important. To this end I asked the unit's lecturer to give very little introduction to who I was or what my work was before I came to the session. I brought the students to test the kettles in groups, and the course lecturer was not present at the testing session. It was very clear to all the students that I was not the tutor marking their work on the unit and that I was going to take the interview data away, anonymise it, and not share it with the course lecturer. I did not explicitly say that these were my prototypes, to try to avoid skewing the conversation, but some of the students guessed or asked me explicitly; when asked I tried to deflect any questions about my relationship to the prototypes with short answers and saying that they would find out more in the lecture I was giving after the testing session. Overall this seemed to work and the conversation felt friendly and honest, and some of the comments made were negative about the designs.

The toolkit testing workshops used mainly postgraduate students from a variety of courses. These were not students that I had met before, nor were they expecting to see me again. The workshops were set up as voluntary additional activities, and nobody was forced to participate. In the majority of these the course tutors were not present at the workshop and the atmosphere felt friendly and open. Feedback was collected anonymously and in writing, so as not to influence the students' opinion. It should also be remarked that these postgraduate students also often had previous professional experience as designers, and many brought to the workshop examples of work from their previous professional roles.

A different set of limitations derives from the fact that testing and interviews were conducted in "lab-like" conditions, so the atmosphere was more awkward for the participant than it would have been in a regular (field) setting. However, every effort was made to mitigate this (Section 5.4.1, 230). In addition, the comparison between the different interview topics within the same setting provides some

indications about how these prototypes would be interpreted in other settings as well.

Throughout the research, it was crucial that the focus was not on measuring the narrativity of each prototype as opposed to its regular everyday equivalent. Though the setting of the testing was "lab-like", the methodological approach of this research falls outside of this tradition (Koskinen, Binder and Redström, 2008), so a quantitative analysis would not be appropriate, not would it be in line with the focus on narrative methods. (Section 3.1, p. 89).

As a consequence, the testing and interviews were conducted in a semi-structured manner and the conversations were not timed so quantitative data could not be compared (Section 5.1, p. 195). The prototypes were not tested against a standard product in the same "lab-like" conditions, and the only data that was used in the analysis were the transcripts of the interviews, forcing the analysis to focus on the participants' interpretation of the experience as opposed to other observations about the ways in which the users used the prototypes (Section 5.2, p. 204). To analyse this, the focus was on "markers of narrativity" that are specific to narratives related to products, deriving from the frameworks described in Chapter 1 and Chapter 2 (Section 5.3, p. 209).

It is important to note that the analysis is subjective, and relies on the researcher interpreting both the abstract concepts described by the narrativity markers, as well as interpreting the interview material.

6.3 Discussion, Observations, and Common Questions

The findings of the qualitative analysis (Section 5.4.2, p. 231) answer the research question and confirm the hypothesis that narrativity can be intentionally designed into products through particular design practice methods, and using film as a source material.

The films proved significant as starting points for the designs, but less of a guiding force to the design process than was predicted. It is therefore important to break down the role of the films and the role of the narrative theory, in shaping the direction of the design practice.

The analysis of the films provided the *content* for the designs, which was articulated in the form of briefs. In practice these were elements such as characters, meanings, atmospheres, emotions, as well as an understanding of the role that the product plays in the film itself (Section 4.1.1, p. 126 and Section 4.3.1, p. 173). The use of the design methods and the Narratives in Design Toolkit (Section 4.1.2, p. 132 and Section 4.3.2, p. 179) brought the attention of the design process towards the users' interpretation of the product experience over time (Section 4.3.5, p.190 and Section 4.4, p. 191).

The films as a starting point are emotionally compelling and exciting narratives because they provide a whole context around the object, formed of storyworlds, characters and settings, as well as story events, which all work together to form meaning. The richness of these narratives that lead to the briefs is partially due to the richness of the source material (the films) and this process was used as a shortcut for the detailed cultural analysis that would inform a speculative design process. The films provided a readymade set of cultural symbols, emotions, characters and dramatic conflict that was rich material to experiment with in the design process. In particular, the idea of dramatic conflict added to the briefs, by playing off certain characteristics against each other, for example using the connotations of dangerous versus safe, or everyday reality versus storyworld. While these characteristics are all typical of the products that were redesigned, setting these characteristics off against each other in particular combinations through time was a direct result of the film analysis.

The second version of the Toolkit focussed the design process on timing and temporal sequences within the product experience. In particular, this highlighted the difference between single points of meaning that can be created in products and the ways in which different points of meaning unfold over time through sequences of events in the product prototypes.

The toolkit was developed and tested in its Version 1 (Section 4.2, p. 146) as a stand-alone tool, though it was used within the design practice in combination with the briefs deriving from the film analysis (Section 4.1, p. 126, and Section 4.3, p. 173). The Toolkit on its own encourages designers to focus on the narrativity of the product interaction, in analytical and generative ways, while they are designing (Section 4.2.5, p. 171 and Section 4.4, p. 191). In most design situations, outside of a speculative design field, the *content* of the design would be provided by the brief,

and the design research around the brief, so the Toolkit would help to shape the *form* the narrative takes within the product experience.

In its second version (Section 4.4, p. 191), the Toolkit adds more detail to the product experience narrative, showing, spatially and graphically, how the dramatic peak of the experience could be created and altered and how the experience could unfold as a narrative. One direction that was considered for the Toolkit to develop was to provide a prototypical story structure, in the form of a graph that outlines the story beginning, conflict, climax and resolution, on which to model the product experience. This was not followed through as it seemed too restrictive to designers, and would work too much as a set model and less as a tool for reflection. This however could lead to further work (Section 7.2, 276).

Some common questions have come up during conversations with supervisors and other researchers, and at conference presentations. While some have been addressed above, a few questions are presented separately below.

Could the project have considered non-conventional narratives as source materials?

The hypothesis of this research (Section 3.0.2, p. 86) is that all product experiences are narratives. Although some may not be very interesting or meaningful narratives, they would still fall within the realm of non-conventional narratives. Conventional narratives have some advantages, as described in Section 2.3 (p. 67) and Section 2.4 (p. 73), of being recognisable structures that are easy to understand within a common cultural context, promoting memorability and facilitating recall and retelling. Conventional narratives are well known and recognised and provide schemata that are easily understood by a general audience (Section 2.4, p. 73, and Section 2.4.1, p. 76). As such, it seems clear that in the first instance this research should focus on conventional narratives. However, non-conventional narratives may have other advantages that may bring different qualities to the product experience; this could be explored through further research (Section 7.3, p. 276).

Is there an intrinsic value judgement inherent in the prototypes?

A particular quality of narrative is that it does not have an intrinsic value judgement, but may create positive or negative effects within the experience of the narrative, which create results that are meaningful, rather than pleasant. This is an area that is starting to be addressed in emotional design, looking at negative

250

emotions as well as experiences with mixed emotions (Fokkinga and Desmet, 2012). In this research, the lack of value judgement manifests itself through negative emotions that were designed into some of the product prototypes, as well as some of the emotional reactions described in the testing; for example, some of the elements that created negative emotional reactions were the fish in the empty kettle, the ghost-like sound of the rattling kettle, or the signifiers of danger in the striped kettle.

Are there possible negative aspects to tellability?

Tellability is not a quality you would always want to design into an experience with a product; it is important that product designers take into consideration the particular product and its intended use when considering incorporating tellability. There are many situations in which we want products to just do their job quietly in the background, for safety reasons, or because they are used in situations in which it would put people on the spot to draw attention to the product in use, or many other reasons. These are products in which we want strong affordances that make the product intuitive to use and something that can be used mindlessly.

Some examples of these products that would not benefit from added tellability would be tools, from surgical tools to woodworking tools, vehicles, and any other product that requires us to be able to use it instantly and through tacit knowledge acquired from experience of similar objects. Having a tool or a vehicle that does not behave as we expect it to is positively dangerous, and not worth telling a story about.

Another type of example would be a product that we want to fade into the background, because it draws attention to things that might be embarrassing or could cause anxiety. The typical example of this is the train toilet door that have a button for close, and a button for lock, but that do not signal whether the door is locked at the moment. This makes it embarrassing and confusing for the user. No matter how funny the story would be to retell, this is not a situation we want to put people in. Löwgren talks about the anxiety and embarrassment caused by delays in ATM machines dispensing cash, especially when there is a queue of people waiting behind you, and particularly if you know you are low in your bank account (Löwgren, 2009). Medical settings are also obvious examples.

There are also different parts of experiences designers would want to consider whether tellability would be appropriate. For example, if considering an airplane

journey abroad, it might make sense to design tellability into the part of the flight in which the plane is cruising in the air, and people are relaxed and tapping into entertainment systems etc. It makes less sense though to design it into takeoff and landing, or passport control, which can be anxiety inducing situations, and we normally want to have a predictable interaction with things around us when feeling anxious, because unremarkable is predictable, expected and safe.

It is up to designers to understand when it might be appropriate or not to use tellability, in the same way that designers might use negative emotions or strong affordances in certain situations but not others.

Is Tellability the appropriate term?

While tellability has been an extremely valuable concept to use when talking about those qualities that are designed into the product and that may prompt a narrative response, I am not entirely convinced that this use of the word would be correct within a narrative theory context. In narrative theory, tellability refers to the noteworthiness of the *events* being told (Baroni, 2013), while in this research this is stretched to include *potential events,* for example those aspects of the product that are likely to cause a particular interaction (event) and be interpreted in a particular way. However, there isn't an obvious alternative to the term, and as such it has remained the term of choice throughout this research, as opposed to using more awkward forms such as "potential tellability", or "potential narrativity".

As used in this research, however, the term tellability performs its role of indicating those qualities of a product that might create narrativity within the product experience. This could potentially also contribute to the field of transmedial narratology (Ryan, 2005) by establishing product experiences as material for narrative analysis.

6.4 Possible implications of the research

Narratives play a central role in the way we experience the world: we use them to condense and remember experiences (Forlizzi and Ford, 2000), to organize memory and human experience (Bruner, 1991; Young and Saver, 2001), and to understand time and time-based events (Abbott, 2008). Narratives are one of the most natural ways for people to communicate, and they evoke meaning and

emotion (Lloyd, 2000; Steffen, 2009). Telling stories is a natural way for humans to communicate (Kearney, 2002; Booker, 2004). Narratives as manifested in novels, drama and movies, are exceptionally effective in creating engaging and memorable experiences (Bordwell, 1985; Tan, 1995; McKee, 1999) and narratives are used as a tool to understand our own identity and selves (Sacks, 1998; Young and Saver, 2001; Michele L Crossley, 2002).

The ability of narratives to communicate ideas and to stimulate imagination allows design to go beyond functional purposes and opens new perspectives to imagine, discuss and propose scenarios for the future as in design fiction (Dunne, 2013; Markussen and Knutz, 2013; Blythe, 2014) or in critical design (Dunne and Raby, 2001; Dunne, 2008, 2013; Malpass, 2013, 2017) and as reviewed by McCarthy and Wright (McCarthy and Wright, 2010).

The findings of this research show that some of these qualities of narratives were transmitted from the product prototypes to the users through the product experience: the prototypes structured the user experience as a story, by organising the time-based events. The prototypes engaged the users, prompted reflection, engaged with user emotions, engaged with users' sense of identity, and made the experience more memorable for the user.

It could be speculated that fostering a narrative response in the user by designing tellability into products could cause some of the qualities that narratives possess to create memorable experiences and engage a sense of identity, for example, to be attributed to products. Thus, an implication of this research could be that by making products with more tellability, designers could foster more engagement between the user and the product because narratives are particularly effective in creating engaging experiences. Similarly, the ability of narrative to engender reflection, to reinforce personal identity, or to increase memorability could potentially be seen as results of product experiences with high narrativity. While these are not direct findings of this research, these implications will be explored in a speculative way below.

6.4.1 Applications to Sustainable Design

Engaging users in a narrative way through the product experience could have the effect of creating products that are more engaging for the user, whether these

products are digital or non-digital. This could have strong implications for sustainability and longevity of products.

When product experience narratives engender an emotional response in the user, users are probably more likely to develop some form of emotional attachment to the product (Chapman, 2015; Grimaldi, 2017). The benefits of creating emotional attachment to objects are clear. People treat objects that they are attached to with much more care, they service and repair them rather than throwing them out, and in general they will use them for a much longer period of time (Govers and Mugge, 2004; Chapman, 2015). Furthermore, when people have special bonds with a particular object, that object will be more enjoyable to use, and the user will be willing to cope with minor problems in its operation or appearance (Norman, 2003). 'There is something Orwellian about the distribution of emotions in our world: All objects can get some emotional attachment, but some objects get far more than others.' (Damasio, 2000, p.58).

Chapman coined the expression "Emotionally durable design" to refer to the sustainable potential of emotional products (Bruner, 1991; Lloyd, 2000; Kearney, 2002; Steffen, 2009). There are many reasons why people become emotionally attached to objects; sometimes these have to do with the object itself, and could be based on qualities like the look of the object or its comfort of use. More often than not the emotional attachment has to do with a past experience with the object, either in the way that the object was acquired, for example a family heirloom or a memento, or in the fact that it was present at an important time and reminds the user of an event, for example the piece of clothing worn on a first date (Csikszentmihalyi and Halton, 1981). In many cases, the object is special because it is associated with a particular person; in other words, the object is special because of the story behind it. The emotion is therefore not always present in the object, but it is present because the object reminds the user of the way they felt in a certain moment or situation. This act of remembrance is dependent on, and inseparable from, the story itself. The story is necessary to facilitate the memory of the object, which then triggers the same emotion.

While the designer doesn't have much control over the types of emotional responses that are linked to the way the object was acquired or its presence at special events in a person's life, designers can nonetheless design prompts for emotional reactions into the product experience; the products therefore may be more likely to be

cherished because of this narrative product experience, because the product resonated emotionally with the user.

In addition, product experience narratives could be created to prompt reflection and have users identify with particular products as co-protagonists in a life story; products could resonate with the user's identity through the stories that the user forms around the products. This could also have implications for Sustainable Design, as products that resonate with a user's identity are less likely to be discarded without thought. This is explored further in Section 7.1.1 (p. 259).

A hypothesis for further research could be that emotional attachment and formation of identity through the narrativity of the product experience could lead people to repair broken products as opposed to discarding and replacing, to hold onto things for longer, or to pass them down through the generations. The use of narrative within the product experience could therefore potentially extend the lifetime of the product and create less landfill.

6.4.2 Applications to Social Design

Because information provided in narrative form is more likely to be remembered than bare facts (Bruner, 1991; Lloyd, 2000; Young and Saver, 2001; Kearney, 2002; Steffen, 2009), a further research hypothesis could be that products with higher narrativity are easier to remember. In particular, when the product experience is structured in a narrative way (T 3.3 in Section 1.2.3, p. 47, and NF9 in Section 1.1, p. 36), it could be speculated that the procedure of use might be easier to remember and more coherent for the user. This might have implications for social design (McCarthy and Wright, 2010; Armstrong *et al.*, 2014; Markussen, 2017), in particular when addressing groups of people with cognitive impairments. People with procedural memory problems might benefit from the coherence that a narrative brings to the product experience; people with other memory problems might benefit from the increased memorability brought on by the narrativity of the experience. This area could be the start for further research.

Narratives are particularly good at engaging empathy and changing the ways in which people relate to each other, by bypassing particular social structures (NF4 in Section 1.1, p. 36). This is particularly relevant and documented in participatory design activities, usually with the aim of participant cooperation or engendering

empathy in the designer (B. Gaver, Dunne and Pacenti, 1999; Blythe and Wright, 2006, 2006; Danko, 2006; Dindler and Iversen, 2007; Wright and McCarthy, 2008). Design outcomes can also engage empathy and social structures in the users; an example of this in relation to social games is The Prison Board Game, which fosters communication and creation of shared narratives between imprisoned fathers and their children (Markussen, 2017). The potential could be for products to perform or facilitate such social and empathy-forming roles within a Social Design framework, triggering shared narratives.

6.4.3 Commercial Applications

The implications of narrative in the formation of identity through life stories are explored from a commercial perspective in Section 7.1.1 (p. 259).

There are other implications of this research on commercial product design environments. Mass customisation was a popular strategy at the beginning of the millennium within product design (Da Silveira, Borenstein and Fogliatto, 2001), as a strategy to create personalised products within a mass manufacturing environment. Along the same principles, the narrativity of the product interaction could be another strategy to counter the standardisation of mass produced products, by designing products that can prompt personalised narratives in response to the product experience. The products could then acquire values and meaning for the user through their experience of use.

Using narrative strategies to foster a more meaningful engagement with products, emotional attachment to products and more memorable product experiences could also have implications on brands, who may use the product experience narratives as a branding strategy. Product experiences could be structured and designed in such a way that users retell the experience to others with more gusto, prompting more word of mouth promotion. This is outside the scope and expertise of this research but could be followed up in further research.

Finally, the ability of narrative to prompt reflection in the user, which is commonly used in critical design (Malpass, 2017), could also be applied within an everyday context, bringing critical design work out of the gallery and into the everyday. Designing everyday objects, for mass manufacture, that intentionally prompt narratives through the product experience could encourage people to be more

reflective (NF2 in Section 1.1, p. 36) towards their everyday possessions, make them value these objects more.

6.4.4 Pedagogic Applications

The Narratives in Design Toolkit was tested with design students across a range of disciplines and levels and the findings are detailed in Section 4.2.5 (p. 171) and Section 4.4 (p. 191). There could, however, be further pedagogic applications of this method. While testing the Toolkit with students from the MA Service Experience Design and Innovation, as a generative tool (Section 4.2.2, p. 158), students were asked to use the toolkit to help them create narratives that would envision the effects of the service they were currently designing. Students were asked to write a response to a design, that didn't yet exist, from the point of view of several stakeholders. This exercise helped the students envision what form this service would take, but it also allowed the students to engage with their stakeholders and participants on a more empathic level, and interpret a possible design from their point of view, as part of the design process. This was not a direct finding of this research, but it could prompt further research in this direction. Further pedagogic applications are detailed in Section 7.1.2 (p. 265).

Chapter 7: Further Developments and Potential Applications

This research falls within the Design Studies tradition of Design Research, as defined by Fallman as aiming to develop new knowledge that can be generalised, often through the application of theory from other disciplines (Fallman, 2008). As such, while this is a small study that refers specifically to research product design outcomes, it is important that the knowledge generated can be generalised and applied by other designers within product design, for example to commercial product design projects, as well as designers from contiguous disciplines such as interaction designers, graphic designers and service designers.

The emphasis therefore is less on the practice-based prototypes as final outcomes, but the contributions to the knowledge and the field of study are articulated in terms of concepts, analytical frameworks, and methods that can be used by other designers to embed narrative into their design. The contributions to the knowledge are articulated in Section 8.2 (p. 279).

The research was developed over a seven-year period and it intentionally engaged with the design research community as the project developed, as a way to test concepts and methods and gather a wide variety of feedback. In addition, I was concerned that the timeline of a part-time PhD would result in the research becoming obsolete before it was published. Therefore, three conference papers, one journal paper and two book chapters were published, and three additional lectures were delivered at symposiums and as part of Erasmus Exchanges or Workshops, which are directly about the PhD research. The full list of publications can be found in Appendix 1 and a timeline that puts these into context can be found in Section 0.4 (p. 29).

These publications and presentations led to several collaborations. Some of them were then incorporated as part of the PhD research, as these directly influenced the research direction. For example, the workshop at TU Delft, ID Studiolab with Steven Fokkinga and Ioana Ocnarescu, devising a framework to analyse narrative use in design in November 2013. This framework was then revised to form the basis of the Practice Review, and revised again to become the Narratives in Design Toolkit.

Some of the collaborations were not incorporated as part of the PhD research because they were outside the scope of this PhD. However, they show how the knowledge generated through this research can be applied to other fields. In particular, the collaboration with Patrick W. Jordan, Andy Bardill and Kate Herd (Middlesex University), detailed in Section 7.1.1 (p. 259), uses the framework of Narrative Definitions (Section 2.3, p. 67) as well as the concept of narrative as a central component in people's identity, and applies it to a commercial product and service design environment. The collaboration with Hena Ali and Monica Biagioli applies the Narratives in Design Toolkit to a pedagogical environment specifically addressing complexity and emotions with service design students, detailed in Section 7.1.2 (p. 265). This collaboration then developed into a further proposal for a research network, which uses narrative methods as one of the ways to access designers' emotions in the design process; this is described through a paper in Section 7.1.3 (p. 270).

Sections 7.2 (p. 276) and Section 7.3 (p. 276) describe several potential applications and outline areas that could be researched further.

7.1 Ways in which the methods and theory have been applied:

7.1.1 Application to Commercial Product and Service Design: Collaboration with Patrick W. Jordan, Andy Bardill and Kate Herd (Middlesex University)

In 2016 I was contacted by Patrick Jordan in relation to the Narratives in Design paper I had co-authored (Grimaldi, Fokkinga and Ocnarescu, 2013). Jordan explained that he was working with a group at Middlesex University and was using his Four Pleasures framework (Jordan, 2000) in relation to the Narrative Definitions found in our paper, to create a framework of how users construct narratives over the lifespan of the product. This resulted in a series of conversations about the topic, and the decision that I would join the group and contribute to the project they were currently working on. This resulted in the publication of the co-authored paper Design for Subjective Wellbeing (Jordan *et al.*, 2017).

My contribution to the conversation has been as an expert on narrative, providing the narrative theory and the context to ground this part of the research. The framework and methodology were in place when I joined the group, but I then

worked with the group on the immersion studies and the articulation of the context and conclusions. Below are some extracts from the work, showing how the Narrative Definitions work within the framework in this paper, and how they are used to build the theory about incorporating product narratives into a life story.

Abstract: We explore the role that interaction with products and services can play in the narratives that we develop about ourselves. We propose a four-level model, which seeks to explain this and use it as the basis for analysing eight immersion studies. In each, we investigate the role that products and services play in shaping narratives, which in turn reflect our self-identity. We also look at archetypes – the various ideals that we can have about ourselves – and at how the alignment of narratives with these enhances our wellbeing. The model offers the potential to link narrative to design features and to identify new market opportunities. However, we recognize there may be challenges in enabling people to articulate narrative and identify their ideal archetype.

Aims of the study

> *"We have, each of us, a life-story, an inner narrative—whose continuity, whose sense, is our lives. It might be said that each of us constructs and lives, a 'narrative', and that this narrative is us, our identities [...]. Each of us is a singular narrative, which is constructed, continually, unconsciously, by, through, and in us— through our perceptions, our feelings, our thoughts, our actions; and, not least, our discourse, our spoken narrations" (Sacks, 1998 pp. 110-111)*

Narratives are central to the way humans understand our identity and our sense of self, and there is evidence to suggest that having a clear and positive narrative about our life, consistent with our values and aspirations, enhances our psychological wellbeing (Jordan, 2000; Dolan, 2014). We posit that products and services that

support life narrative will enhance subjective wellbeing and contribute to happiness. Consequently products and services are likely to provide stronger relationships between owner and 'thing' and have longer, richer cycles of ownership. In the current climate this can be seen as an economical, environmental and psychological imperative. Through this study we aimed to develop a design framework that could be usefully used to design products and services that work in positive symbiosis with owners' life narratives.

Method

We structured this work as a series of on going designerly conversations within our working group and with products that we own. Through a conversational workshop, we elicited four narrative types that appeared to relate to products and services and organised these into a hierarchy. These levels being:

- Life narrative
- Story narrative
- Incident narrative
- Thing narrative

We went on to explore this notion further by writing individual immersion studies focussing on our ownership and use of two products: a car; a domestic appliance. At the outset we considered that these might be, in turn, a high and a low interest product but this did not subsequently bear out. We left the immersion studies unconstrained with the consequence that some were written closer to pre-analysed lists of facts, and others with clear narrative threads in the unfolding story.

We analysed these immersion studies through a second conversational workshop. The text was mapped against the four narrative levels and, through this process, we began to explore how designed features might enhance the various narrative levels. However, it became increasingly apparent, as we added to or modified the design of our products through conversation and thought experiments, that life narrative is the overarching focus. Designing 'things' and 'incidents', understanding the operating agency and causality that will sculpt these into 'stories', has to be driven by the life narrative if it is to lead to a product that enhances subjective wellbeing for that individual.

To explore how design might operate in the four narrative levels, and to ground this work in theory, we mapped them against Jordan's four pleasures (2000) and Grimaldi et al's (2013) narrative definitions.

As the focus on the individual emerged, we sought a way to characterise individuals and their life narrative that would contribute to our framework. In design practice, this is typically done by creating personas, but this does not necessarily provide a full range of life narratives. However, Jungian archetypes (Mark and Pearson, 2001) appeared to provide this characterisation.

The outcomes from the study

The four narrative levels

Life narrative. A narrative about a person's life as a whole. Aspects of the narrative will focus on product features and product manifestations that range from aesthetics to ethics. Reflective responses to these factors will change over time. Interactions with, and ownership of, products and services can enhance or diminish a person's life narrative.

Story narrative. The interaction with a series of products or services that enable an individual to build a story around a sequence of events connected by causality or agency. Story narratives enable articulation of a life narrative to ourselves and our social and familial connections. Collecting and recounting these stories reinforces life narrative and enhances subjective wellbeing.

Incident narrative. A narrative around a single event or incident. Incident narratives operate in the same way as story narratives, reinforcing life narrative, but focusing on individual interactions or events.

Thing narrative. A narrative about the physical properties and manifestation of a product or service. These physical properties can operate at both a visceral and reflective level depending upon their relevance to the life narrative.

Definitions of Narrative (Grimaldi et al., 2013)	Representation of Events	Chronological	Characters	Causality or Agency	Values and Emotions	Conflicts and Climax	The Four Pleasures (Jordan, 2000)	The Four Narrative Levels
D5 Entertainment Value	●	●	●	●	●	●	Ideo Pleasure	Life Narrative
D4 Value-Laden Narrative	●	●	●	●	●			
D3 Logically Sequenced Narrative	●	●	●	●			Socio Pleasure	Story Narrative
D2 Sequenced Narrative	●	●	●				Psycho Pleasure	Incident Narrative
D1 Minimum Definition	●						Physio Pleasure	Thing Narrative

Table 12 Mapping the Four Narrative Levels. Source: (Jordan et al., 2017).

Conclusions: The four-level model offers the potential to understand how characteristics of a product can work their way up from the lowest 'thing' level through the 'incident' and 'story' levels until they potentially impact on a person's life narrative. This gives a lens for understanding why a product impacts positively or negatively on someone's wellbeing. When looked at in conjunction with the archetypes this enables us to form a deeper understanding of users and to understand why their experiences with products resonated with their personality. The table below identifies a property of each of the products in the case studies and its effect on the user's quality of experience.

Product	Property	Contribution to Narrative
Washing Machine (KH)	Dangerous	Threatening her children's wellbeing
Car (KH)	Practicality	Taking care of her family
Kettle (PJ)	Sophisticated	Was able to show his good taste during the buying process
Car (PJ)	High-Status	Failed to contribute to the humorous narrative he enjoys with vehicles
Kettle (SG)	Cheap	Demonstrated frugality
Car (SG)	Low status	Didn't violate her and her friends' values
Washing Machine (AB)	Repairable (although not easily)	Was able to demonstrate prowess in repairing it
Car (AB)	Interesting	Formed a bond and kept it long-term

Table 13 Product properties and their contribution to narrative. Source: (Jordan et al., 2017).

Strictly speaking, these are not actually properties of the products but of the interaction between the product and the person. For example, the Zanussi washing machine was repairable for AB, but that doesn't mean it would be repairable for the rest of us. Similarly, the Sainsbury's kettle was sophisticated in PJ's eyes, but that doesn't mean that others would have seen it in the same way. One avenue of future work is to look at whether there are common patterns linking properties and life narratives.

The emergent design framework from this study will enable us to ask and answer new design questions relating to a product or services contribution to subjective wellbeing. For example:

1. *Intelligent Guesses* - People who drive people carriers are innocent caregivers.
2. *Product Analysi*s –Who are these products currently designed for? Jesters or Rulers?
3. *Identifying Gaps in the Market* – a particular brand might not have any products in its range for Jesters, for example.
4. *Innovation* – What does a 'Heroes' train service look like?

However, given the overriding importance of life narrative and the significance of personality traits it is clear that better approaches to eliciting them is needed. Furthermore, recognition that life narratives can be both real and/or ideal, emergent, overt and covert, is necessary. Are there effective ways to systematize personality traits to inform this framework? For example: do we all have elements of a different vision of paradise?; Do we all wish to leave a mark on the world but in different ways?; Are our connections with others differently characterized and do we wish to structure the world in different ways?; do we have one trait from each quadrant? Our ongoing work requires identifying appropriate methods to enable this.

Potential and Further Applications

I am continuing to work with the group on a second phase of this project. After having established the framework, the idea is to test this though a series of design workshops for a live client. Following a Knowledge Exchange model, we would like

to test whether this framework can be used as a design method, focussing on how the products or services can potentially be incorporated into a life narrative.

7.1.2 Pedagogic Applications: Collaboration with Hena Ali and Monica Biagioli

In 2016, I took on the role of Acting Programme Director for the Spatial Communications programme, which included the MA Service Experience Design and Innovation. At the time Hena Ali was teaching on the course and Monica Biagioli was Acting Course Leader. In pedagogic conversations around the course we realised that we were all interested in the ways in which different qualitative methods feature within a service design process. In addition, we were interested in the ways in which students on the course were managing both the complexity of the information they needed to access for the course projects, as well as the emotional toll that some of these projects took on them.

We decided to start investigating the area by doing a small pilot study in which we would test qualitative methods with the students, one method coming from each of our research focusses, and reflect upon the ways in which students used these methods to deal with complexity and emotional aspects of the projects. The Narratives in Design Toolkit was used as part of this project.

Abstract: This practice-led investigation evaluates three generative design tools for active and tacit student engagement with postgraduate Service Design students, and their impact on the students' approach to complex design projects. In Service Design education, generative design tools have a robust pedagogical role for efficient knowledge creation and student engagement, yet are still under-explored academically.

The Learn 'n' link method delineates learning as an interactive dialogic practice for creative idea conceptualisation. The Zine Method is a visual ethnography approach that can be applied holistically to frame the problem area, propose a way forward,

and prototype the solution. The Narrative Toolkit enables students to discuss and critique the narrative properties of existing designs and envision design outcomes. The students then use the Zine Method to qualitatively evaluate the methods' contribution to their understanding of complex design problems and service user experience, and their function in bridging the gap between user research and generative design processes.

Introduction

This exploration of Service Design pedagogical methods, as well as qualitative design research approaches, develops generative pedagogical methods and tests these with service design students in a studio environment. The study is led by design academics that are practicing designers, design researchers and social innovators, aiming to contribute to the discourse on the emergence of service design pedagogy, and validating innovative design-led methods within Service Design.

Studio based design pedagogy engages students and tutors in practice (Shreeve and Batchelor, 2012) and is embraced as 'constructed, self-regulated, situated, and collaborative' practice informed by design thinking as a team-based learning process (Scheer, Noweski and Meinel, 2012). Service Design, as an emerging discipline, draws on multidisciplinary practice to strategically develop innovations. Service Design Pegagogy though is still under-explored academically (Gaver, Dunne and Pacenti, 1999; Sanders, 2002), methods are evolving rapidly, and generic methods informed by traditional design pedagogical practice are employed for knowledge dissemination and creation. In Service Design, which primarily focuses creativity, experimentation and innovation in the public sphere, the consideration of generative tools can support questions, building a framework for design practice and reflection. A lot of methods are adapted from the service design industry into pedagogical methods for service design. Similarly, this research re-appropriates traditional generic design pedagogy to custom-design three structured collaborative, experimental, generative design methods, with the aim of exploring effective student engagement in terms of attention, retention and innovative process.

Within Service Design practice, generative design tools have a robust role mapping, defining, developing and delivering effective and sustainable services. This research develops three customised generative design methods with an innovative pedagogical role to test efficient knowledge dissemination and student engagement.

Learn n Link, Narrative Toolkit and Zine Methods delineate learning as an interactive dialogic practice; these methods draw on individual capacity as well as collaborative team dynamics enabling the students to process information with time-based knowledge mapping, connecting and analysing activities (Learn n' Link). They allow students to discuss and critique the narrative properties of envisioned design outcomes (Narrative Toolkit). In addition these methods allow the student to creatively visualise the problem area and solution and record emotion in decision-making (Zine Method). The practice identifies with the notion of cultural mapping (Duxbury, Garrett-Petts and MacLennan, 2015) an 'action journey' undertaken specifically thorough structured methods to identify and investigate the complex context within which service design operates. These methods take the students through a structured journey to absorb, assess and map knowledge creatively; to create innovative transformation strategies and services through deep reflection.

Design-led Evaluation Framework

The Higher Education Academy UK reports the term 'student engagement', based on definitions in the literature and the discussion of the character of engagement and its alternatives, summarised below:

> *Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution (Trowler, 2010).*

Within Service Design, where students come from diverse backgrounds, we are conscious of making assumptions based on traditional education models. Design thinking in this context is useful to engage students creatively while learning and designing reflectively. The researchers observed engagement in response to the methods designed. The methods presented here were specifically designed to draw on the practice of knowledge transfer in the context of co-design, organizational learning, active learning, converting tacit knowledge to explicit knowledge, collaborative knowledge construction, peer-to-peer learning and learning-by-doing. Engagement and creativity was assessed qualitatively using reflective

insights, narratives around the learning experience, and zines as holistic and subjective records of the learning experience.

Conclusions and discussion

Figure 70 All three methods employed as a methodology for effective student engagement. Author's own.

The three methods engage with complexity, drawing on emotion and subjectivity to foment student involvement with a process and actively engage creativity for service design pedagogy.

The researchers designed this pedagogy to bring design skills and knowledge to the foreground as integral components of learning and experimenting; enhanced student engagement through innovative teaching methods; and as demonstrated in the feedback sessions, provided a richer learning experience so as to generate a deeper understanding of problem area and solution for the students involved in the sessions.

Our contribution is in three key areas: addressing complexity, addressing personal points of view and narratives, and acknowledging the role of emotion in the process

of analysis. Service design projects are complex. Creative teaching facilitates understanding through the organisation and interpretation of project information and encourages connections to emerge from the process. The key element is to break up the brief/initial info/ text and pull out information that can help initiate the research from an informed baseline (discover and define phase) to the more open and creative ideation of design outcomes (develop phase). Engaging with narratives in the process of envisioning design outcomes allows students to easily empathise with stakeholders and interpret the design from their point of view. The zine construction foments exploration of the project space in all its facets, and also allows for prototyping the solution. Personal perspectives can be expressed via folds, cuts, and placement in three dimensional space. All three methods can be especially useful when there is conflict or a project has stalled. Emotions are made visible and can in that way be a part of the analysis at key junctures in the project. If foregrounded at the very beginning of a project for both stakeholders and designers by structuring interactions to account for them, then their emergence throughout the project can be better managed. This is a key finding, as the emotional dimension is often not captured in the analysis process, and yet, it is a key component in decision-making (Damasio, 2000; Gill, 2015; Pässilä and Owens, 2016).

Using only one method for evaluation at the completion of the project, the zine method, worked to reinforce ideas through the method. Findings related more to its application and it is believed by the researchers that this was a format bias. The finding from this is that in future testing of various methods with one group, the researchers would make all methods available for conclusions and evaluation; in this way giving the participant control over the way findings would be organised and presented. This could in turn allow for hybridising of methods at the evaluation stage, perhaps combining all three in one format.

This initial research suggests that these methods have a lot of potential to fill specific gaps within Service Design Pedagogy. The next steps in this project will be to continue testing and refining these methods by embedding them throughout project work on an MA in Service Design, continue to test applicability to other projects within the service design field and continue to identify pedagogical gaps to address through design methods.

This study led to a reflection about qualitative methods that access tacit knowledge, narrative, visual and cultural expression, as well as designers' emotions. In what ways does making this knowledge visible or acknowledging it during the design process affect the designer's decision-making?

This was then identified as an area that could be investigated further, and was developed into a positioning paper for a network on designers' emotion in the design process (Section 7.1.3).

7.1.3 Application to Research on Qualitative Methods for Addressing Emotions: Designer's Emotions in the Design Process – Collaboration with Monica Biagioli and Hena Ali

Following from the paper in Section 7.1.2 (above), the conclusions were developed further, investigating how qualitative methods can help to access the designer's emotions in the design process, and how this area has not been investigated in depth from a design point of view.

Extracts from Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process, in Design Research Society Conference Proceedings, DRS2018, Limerick, Ireland. (peer reviewed)

Abstract: This is a position paper towards the establishment of a research network to address the impact of tacit experiential knowledge, emotion, and cultural perspective on a designer's decision-making during a design process. With this network, we are aiming to start a focused discussion across geographies and cultures regarding the role and impact of designers' emotions within their own design process. The function of this is to foreground the experiential and emotional domain of designers' practice and examine the role of tacit experiential knowledge in design decision-making.

The paper sets up the basis and context of discussion, exploring the three key areas to be addressed by the network: designers' emotions as key drivers in decision-making; tacit experiential knowledge; and addressing emotion in culturally-situated

design practice. This is followed by our proposed methodology and network objectives and expected impact and outcomes.

Introduction

This position paper outlines the proposal for an international research network of design academics and industry specialists to highlight the importance of non-textual, narrative, qualitative methods and forms of expression to represent as well as foreground emotional and experiential aspects of designers' engagement within a design process. We are focussing on the designer's emotions and experience within a design process as the designer is often considered a neutral person within the process. However, from our teaching experience, design students have complex relationships with their project especially when they tackle "wicked problems" (Rittel and Webber, 1973; Buchanan, 1992). Some of these projects generate strong emotions and feelings in the designer, such as empathy, sadness, anger or a feeling of empowerment, and this has a bearing on the project outcomes. We are drawing attention to qualitative methods because they allow for gathering information, such as tacit experiential knowledge and emotional states, that would not be visible in data set analysis, however, has impact on project planning, engagement and outcomes.

We are building our approach to the network and its methods from an understanding about cultural transmission of information (formal, informal, technical) (Hall, 1959) the impact of our data-driven reality on human communication (McLuhan, 1994; Boorstin, 2012) and how that has a direct effect on our sense of embodiment (Dewey, 2005; Laing, 2010). We connect the difficulty to base decisions on qualitative forms to a lack of trust generally in the informal realm—particularly emotions—to impart useful information in regards to decision-making (Belfiore and Bennett, 2008; McGilchrist, 2009). An appreciation and respect for the tacit dimension (Schön, 1985; Ingold, 2000; Polanyi, 2009; Gill, 2015) is a key aim of the work we propose for this network.

The project is proposed with a short-term (first phase) and long-term engagement plan. The research network will form the first phase of the longer project. In this first phase we will be inviting participants to two discovery workshops and one dissemination event. These workshops and events will be held in London over the course of 18 months, from Summer 2018.

The diverse participant group draws knowledge across disciplines and geographies to get a more rounded picture about emotion and its impact on the design process. The initial call for interest has drawn a group of 20 participants from Pakistan, Brazil, U.S.A., Israel, Finland, Spain, Denmark, and the UK. Adopting a democratic and participatory structure to the network sessions will, as much as possible, seek knowledge from sites of experience outside of the UK. Participant expertise spans across different subject areas and contexts, including academics and industry representatives in service design, product design, British Council Pakistan, workshop facilitation, graphic design, fashion, business and management, innovation, transdisciplinary art, teaching and learning, and IT.

The first workshop will address the three main themes: emotion, tacit knowledge and cross-cultural participation.

Designers make tacit experiential decisions at every stage of the design process. Emotions such as empathy, anger and fear in relation to a particular topic, circumstance, or grouping can trigger responses that influence a design process. The role designers' emotions play in this process is not often made explicit, despite the important function emotions play in decision-making. This has implications for the role of the designers' emotions in design decisions. Human-Centred and Emotional Design (Forlizzi, 1997; Jordan, 2000; McDonagh *et al.*, 2003; Norman, 2003; Sanders and Stappers, 2008; Hassenzahl, 2010; McCarthy and Wright, 2010) often focus on end users' emotions, however the emotions of designers and facilitators within co-design situations are not acknowledged as often. The informal, the non-textual, the narrative and the emotional that exist in the liminal space between formal analysis of data and formal design decision-making are not accounted for qualitatively and/or made explicit.

Qualitative design and art based methods have a particular value for accessing informal, non-textual, narrative, and emotional elements and making them tangible. These qualitative design methods are often applied to researching the end users' emotions, but rarely are they used to look inwards towards the designers themselves.

If we can, as designers, access this type of tacit information—belonging in the informal realm, characterised by complexity and ambiguity, and expressed as emotion—then its impact on rational decision-making can be acknowledged.

Through our work applying qualitative methods to service design pedagogy we have identified a gap in accounting for tacit experiential knowledge and emotional states in the designer when decision-making via common design processes. Designers' emotions are important as they are key drivers in decision-making within the design process. The research work we propose aims to help the designer identify key emotions at play at different stages of a project or activity. We will examine how designers' emotions play a role in how the project is structured and delivered and how the findings are collated and interpreted. By making designers' emotions more conscious, they can be accounted for and can be more effectively incorporated as an additional key aspect for effective engagement and resilience in the process of project delivery.

Emotion is in the informal domain and accounting for its role in a decision-making situation requires an acknowledgement of embodied experience. There is a current bias towards quantitative forms of collecting and analysing experience in order to make the case for making decisions which omit findings from the informal experiential range, as they are so difficult to quantify.

Through the research network, we will draw knowledge across disciplines and geographies to get a more rounded picture about designers' emotions and their impact.

Proposed methodology

As part of this research network will be inviting participants to two discovery workshops and one dissemination event over the course of 18 months. The participant group draws knowledge across disciplines and geographies to get a more rounded picture about emotion and its impact on the design process. The makeup of the group is detailed in the introduction; we invited researchers and practitioners who we knew had worked in the field of emotions, tacit knowledge and cross-cultural participation, and who, from previous conversations and previous collaborations, we thought would have an interest in this topic. In particular, we tried to draw people who had worked on emotions, tacit knowledge and cross-cultural participation in relation to problem-setting and wicked problems.

The first workshop will address the three main themes: emotion, tacit knowledge and cross-cultural participation.

The first workshop will make use of qualitative art and design methods to:

- Test various spatial and relational configurations that allow embodied experience to emerge as key finding from informal experience. Evolving methods for accounting for the informal in a situated experience.
- Note and capture tacit experiential emotional responses in our research network in tandem with the capture of data of network participants' personal values and attitudes. Analysis of this data will be conducted to evolve a means of understanding the relationship between what is expressed as personal value and attitude and what is textually recorded as personal values and attitudes.
- Note and capture emergent human narratives: discovering what people think and know provides us with their perceptions of experience.
- Test methods of documenting and visualising emotional experience throughout the design process and its possible links to decision-making.

At this stage, we hope to identify 'where, when and how' within design process are significant points of interests for designers accounting for their own emotions. This as process of learning shall evolve valuable insights and identify challenges within existing and new design practices.

The second workshop will provide spaces for contributions by participants around the themes of the project, as well as methodological contributions to gathering and analysing data. The aim of the workshops is to construct a democratized design space to engender an open mind set.

The exploration is perceived as valuable in terms of identifying emotional triggers, challenges and recharging points within design practice for designers' emotions as design confidence and wellbeing. This in retrospect impacts the collaborative project outcomes operationally. Accounting for designers' emotions can lead to balancing stress, facilitating the feeling of being in charge of things, and identification of motivators to push into action. Enquiring from a socio-cultural perspective, the aim is to realise a comprehensive database as baseline to work up from. This shall help ascertain effective design tools to map designers' emotions and develop a rich repository of perspectives. This can lead to effective working and collaborative initiatives where the designer's wellbeing is accounted for as central to project sustainability.

The dissemination event will then broadcast the findings as well as provide a platform for more voices to shape a future project.

Discussion and Directions

With this network, we are aiming to start a focused discussion across geographies and cultures regarding the role and impact of designers' emotions within their own design process. The function of this is to foreground the experiential and emotional domain of designers' practice and examine the role of tacit experiential knowledge in design decision-making.

Our intended outputs are: an index of emotional and experiential aspects; a cross-referencing of those with cross-cultural elements; and an index of qualitative methods examined within the framework of emotion, experience, and culture.

With these initial findings, we will seek to model an application of qualitative methods focusing on emotional and experiential aspects of designers' engagement within a design process. We envision this in the form of an index of potential tools and techniques to help the designer account for type, timing and sequence of emotions during a project, not just for participants but also for him/herself.

We also consider it relevant to provide a template for designers to map and track their emotions against a project timeline. The project will provide case studies to visualise the designers' emotions mapped against time on the project, with points in the graph identifying key points of confusion/stress as well as design tools to address those. From those, we will also propose a beginning approach to application of this model within the sequential framework of the double-diamond; seeking to identify points within the design process where qualitative methods are most relevant from the designer perspective.

This initial inquiry is a first step towards a bigger and longer project working with democratic approaches within design decision-making processes. We see the consideration of what is collected for analysis and how it is collected and analysed to be fundamental areas to explore towards this greater aim. This project is not about problem-solving but about taking a wider view into all the elements that play a role in a decision-making process in design.

This paper was developed further into an AHRC Network bid, which was submitted but we were notified in July 2018 that it has not received funding. We are planning to re-evaluate how to take this forward after the summer.

7.2 Narratives in Design Toolkit version 2 - Applications

A further development of this research could be to accurately test the Narratives in Design Toolkit version 2 (Section 4.4, p. 191) within a pedagogic setting to see whether this second version would add more pedagogical value than version 1, in particular when tested as a generative tool with product design students. In addition, the Toolkit could be expanded to include indications of different prototypical story structures, to see whether this might add more value or make the design process too mechanical (see Section 6.3, p. 248).

7.3 Speculative directions and further work

The potential of this approach to narrativity in the product experience could lead in different directions. Some of the directions explored in the discussion chapter could have to do with the implications of narrative for fostering sustainable habits and behaviours (Section 6.4.1, p. 253), and the implications of narratives for social design, especially when working with people with cognitive and memory impairments (Section 6.4.2, p. 255). In addition, Section 6.3 (p. 248) discussed using non-conventional narratives as source material for a similar project, to see whether the results of using these types of narrative would be substantially different from those obtained with conventional narratives.

Chapter 8: Conclusions

8.1 Outcome

The research question driving this work is whether design can enhance the user's experience of interacting with an everyday non-digital product through the application of narrative elements derived from film. To investigate this question, key concepts from different disciplines were used. There has been interest in the field of product design theory in moving away from discussing the physical object itself and towards discussing the interaction experience that the user has with the object, which takes place over time (Forlizzi, 1997; Löwgren, 2009; McCarthy and Wright, 2010; Steven Fokkinga and Desmet, 2012; Grimaldi, 2013, 2015).

The research has confirmed the initial hypothesis: that designers can harness narrative elements from other mediums in order to create products that direct the user experience towards an enhanced narrative interpretation Section 3.0.2 (p. 86), through a series of intermediate steps. The Literature Review in Chapter 2 (p. 51) provided frameworks for looking at product experiences as narrative experiences. Product experiences were put in relation to the narrative interpretation, drawing upon the literature on product experience, interaction design and experience design, as well as the literature on cognitive narratology. This focussed on the narrative that the user creates when interacting with a product, either in terms of in-the-moment interpretation, or in terms of memory or retelling the experience. A classification of the ways in which narrative is already used in design in Chapter 1 (p. 31) validated the existence of a gap in knowledge about this particular use of narrative in design as well as providing a framework for differentiating ways in which narrative can contribute to the design process.

Methods for analysing films and creating design briefs based on the content of the film, as well as design methods for designing for narrativity in the product experience, were developed and described in Chapter 3 (p. 84) and Chapter 4 (p. 123). These allow designers to harness narrative elements from another narrative medium, in this case film, focussing on the content of the film, and the role the product plays in that film, to inject the product designed with narrative meaning. In addition, the Narratives in Design Toolkit (Section 4.2, p. 146, and Section 4.4, p. 146) helps designers to focus on the narrative structures, sequences of events and

narrative qualities that might be designed into the user experience of the product. These methods help designers to design for narrativity of the product experience, or to design products that are more tellable.

Finally, the designed prototypes were tested with users (Section 5.1, p. 195) and the results were qualitatively analysed, analysing the users' accounts of the product experience for "markers of narrativity", to determine what types of narratives were triggered by the different prototypes (Sections 5.2, p. 204, and Section 5.3, p. 209). The prototypes were found to trigger different types of narratives than those triggered by the users' own products. The accounts showed the users engaged with the prototypes and created product narratives that were sparked by associations with the prototypes, linking memories and storyworlds, engaging emotionally as a response to the interactions, and assigning agency to the prototypes. In addition, the prototypes were found to "direct" or structure the user experience over the time of the interaction.

8.2 Contributions to the knowledge

8.2.1 The creation of classification and frameworks (Narrative Functions, Typology of Narrative Use, Definitions of Narrative and Framework of Narrative Product Experience)

Defining and categorising ways in which narrative is used within product design through the Narrative Functions and the Typology of Use makes it possible to define with precision the type of narrative use that will be within the scope and outside the scope of this study. As a consequence, it also provides a framework for other designers to define the scope of projects that involve narrative. By clearly categorising different ways in which narrative is used it is easier to make a case for a particular use which falls outside of the typical examples of narrative design, while at the same time also identifying areas in which narrative has already made a valuable contribution.

These classifications make it possible to define a gap in knowledge in the uses of narrative in design. Specifically, this gap is identified as design structuring the user's product experience over time as a narrative. This gap in knowledge and practice was recognised as one of the prompts for this research, and through the classifications it was validated as an appropriate area of investigation, which will contribute new knowledge to the field of product design research and practice. In particular, this study is concerned with the implicit narrative that exists in product use, throughout the time of the user's experience with the product, and how designers may be able to direct this narrative to achieve particular effects in the user experience.

The classifications inform the idea generation and design methodology for the practice-based aspects of the study, mapping directly onto a number of the categories used in the idea generation process. The classifications are used as a starting point for idea generation and concept manipulation within the design practice sections of this study, and are incorporated into the Narratives in Design Toolkit.

The Framework of Narrative Product Experience positions the narrative experience at the centre of the product experience, keeping time as a key aspect of interpretation. This conceptualises time as a central element of the product experience, which is reflected in the design process and

methodology, and helps to define the time span this research focusses on: that of a single use interaction experience. Looking at the time span of the interaction makes it possible to look at sequences of different events in an experience and how meaning is created through these.

The Definitions of Narrative qualify different types of narrative that might be present, and the elements that constitute these. The Definitions of Narrative are used in the Narratives in Design Toolkit as well as in the design process to design narrativity into a product experience. The Definitions of Narrative are also divided into their component parts (narrative elements) as a way to prompt design concepts.

The extrapolations of key concepts related to narrative, the "markers of narrativity", within product experiences informs the ways in which people can analyse these experiences. Key concepts related to narrative and described in this Literature Review, such as emotion, identity, agency, memory, and storyworld, are used in the analysis of the test data as markers of narrativity.

8.2.2 The concept of tellability as applied to products.

This can be seen as a contribution to product literature but also to narratology in particular Transmedia and Cognitive Narratology (Herman, Jahn and Ryan, 2005; Ryan, 2005).

Tellability frames products as a narrative medium, containing the *potential* to elicit narrative responses in users. This implies that narrative responses can be designed for and considered as part of the product experience.

Tellability establishes narrative as a scalar quality of a product. Though every product that is interacted with creates an experience that is interpreted, remembered and retold in narrative form, some of these experience narratives are more memorable, engaging and interesting than others. In other words, some of these experience narratives contain more narrativity (a quality of the experience narrative itself) or different types of narrativity.

Tellability helps designers consider which elements of their design could elicit a narrative response. Tellability presupposes the link between

qualities of the product and the ways in which these qualities may direct the user towards certain types of narrative interpretations.

Tellability provides a language for designers and design researchers to assess in what ways particular products are affecting the interpretation, memory and retelling of their product experience. Providing a language facilitates conversations between designers that can be more precise and fruitful, because it allows for additional nuance in the discussion.

8.2.3 Methods

Toolkit and Design Methods

The methods for incorporating narrative elements into design practice, with the focus on the narrativity of the designed product. This includes the methods that are codified into the Narratives in Design Toolkit, as well as the description of the design process in this research, applying elements from films to product design.

The Narratives in Design Toolkit provides a tool and a language for designers to talk about narratives within design work, and make it easier for designers to focus on elements of narrative within the design process. Though narratives have been extensively used in design, there is a lack of unified language around the terms, which can lead to misunderstandings in terms of what is considered to be narrative within a design or within the design process, the presentation of the product or the user experience.

The narrative design methods shown in Case Study 1 and Case Study 2, and codified in the Narratives in Design Toolkit, show a way in which elements of narrative theory can be used by designers to design products focusing on the narrative aspects of their product experiences. Designers can use these methods in order to design more tellable objects (using the Toolkit) resulting in product experiences with more narrativity.

The specific methods that lead from film examples to briefs for kettle design could also be followed as a model or adapted in other projects.

This would involve not only using the Narratives in Design Toolkit, but also analysing films to come up with briefs for speculative design projects.

Methods for testing and analysing products for narrativity

Methods for collecting and qualitatively analysing test data to build a picture of the narrativity of the product experience. These were formulated throughout the process of the research because a viable template for narrative analysis of test data for products did not exist. The Literature and Practice Reviews made it possible to focus the analysis on markers of narrativity, both through specified categories and through keywords, and this created a method that could easily compare the qualitative aspects of the story told in the interview.

The testing methods, used to test prototypes for narrativity with participants and elicit qualitative narrative data from a product experience. These include the ways in which a prototype can be tested in a "lab-like" setting but can focus on qualitative and narrative aspects, and how a semi-structured interview method can be used to elicit these responses.

8.2.4 The practice-based outcomes as examples

The practice-based outcomes of the study, Kettles 1, 2, 3 and 4, to be used as examples of how to use the design methods and what effects these may obtain. These are not the main contributions to the knowledge, nor the main outcomes of the research. They function as examples of how this process could be followed and to what effect.

Bibliography

Abbott, H. P. (2008) *The Cambridge Introduction to Narrative*. Cambridge University Press.

Abbott, H. P. (no date) 'Narrativity', in Hühn, P. and et. al (eds) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press. Available at: http://hup.sub.uni-hamburg.de/lhn/index.php/Narrativity (Accessed: 5 December 2012).

Ahn, J. and Smith, M. (2011) 'Studio Weave presentation at Narrative in Practice 2011'. Available at: http://www.narrativeinpractice.com/nip2011/#jeahnmariasmith.

Aristotle (1987) *The Poetics of Aristotle: translation and commentary*. London: Duckworth.

Armstrong, L. *et al.* (2014) 'Social design futures: HEI research and the AHRC'.

Auger, J. (2013) 'Speculative design: crafting the speculation', *Digital Creativity*, 24(1), pp. 11–35. doi: 10.1080/14626268.2013.767276.

Bal, M. (1997) *Narratology: Introduction to the Theory of Narrative*. 2nd ed. Toronto: University of Toronto Press.

Bal, M. (2002) *Travelling Concepts in the Humanities: A Rough Guide*. Toronto ; London: University of Toronto Press.

Bardzell, J. (2011) 'Interaction criticism: An introduction to the practice', *Interact. Comput.*, 23(6), pp. 604–621. doi: 10.1016/j.intcom.2011.07.001.

Baroni, R. (2013) 'Tellability', in Hühn, P. et al. (eds) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press. Available at: http://www.lhn.uni-hamburg.de/article/tellability (Accessed: 30 June 2013).

Belfiore, E. and Bennett, O. (2008) 'The social impact of the arts', *Hampshire: Palgrave Macmillan*.

Benford, S. *et al.* (2009) 'From interaction to trajectories: designing coherent journeys through user experiences', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 709–718. Available at: http://dl.acm.org/citation.cfm?id=1518812 (Accessed: 8 April 2013).

Blythe, M. *et al.* (2010) 'Critical dialogue: interaction, experience and cultural theory', in *Proceedings of the CHI 2010*, pp. 4521–4524.

Blythe, M. (2014) 'Research through design fiction: narrative in real and imaginary abstracts', in. ACM Press, pp. 703–712. doi: 10.1145/2556288.2557098.

Blythe, M. A. and Wright, P. C. (2006) 'Pastiche scenarios: Fiction as a resource for user centred design', *Interacting with Computers*, 18(5), pp. 1139–1164.

Booker, C. (2004) *The seven basic plots: why we tell stories*. London: Continuum.

Boorstin, D. J. (2012) *The image: A guide to pseudo-events in America*. Vintage.

Bordwell, D. (1985) *Narration in the Fiction Film*. Univ of Wisconsin Press.

Bourdieu, P. (2010) *Distinction (Routledge Classics): A Social Critique of the Judgement of Taste*. 1st edn. Routledge.

Bruner, J. (1991) 'The narrative construction of reality', *Critical inquiry*, 18(1), pp. 1–21.

Buchanan, R. (1992) 'Wicked Problems in Design Thinking', *Design Issues*, 8(2), pp. 5–21. doi: 10.2307/1511637.

Campbell, J. and Campbell, J. (2008) *The hero with a thousand faces*. Third edition. Novato, Calif: New World Library (Bollingen series, 17).

Chapman, J. (2015) *Emotionally Durable Design: Objects, Experiences and Empathy*. Routledge.

Chatman, S. B. (1978) *Story and Discourse: Narrative Structure in Fiction and Film*. Ithaca ; London: Cornell University Press.

Cross, N. (1999) 'Design Research: A Disciplined Conversation', *Design Issues*, 15(2), pp. 5–10. doi: 10.2307/1511837.

Cross, N. (2007) *Designerly Ways of Knowing*. Birkhäuser GmbH.

Csikszentmihalyi, M. and Halton, E. (1981) *The Meaning of Things: Domestic Symbols and the Self*. Cambridge University Press.

Da Silveira, G., Borenstein, D. and Fogliatto, F. S. (2001) 'Mass customization: Literature review and research directions', *International Journal of Production Economics*, 72(1), pp. 1–13. doi: 10.1016/S0925-5273(00)00079-7.

Damasio, A. (2000) *The Feeling Of What Happens: Body, Emotion and the Making of Consciousness*. New edition. Vintage.

Damasio, A. (2006) *Descartes' Error: Emotion, Reason and the Human Brain*. Vintage.

Danko, S. (2006) 'Humanizing design through narrative inquiry', *Journal of Interior Design*, 31(2), pp. 10–28.

Desmet, P. (2002) *Designing emotions*. BPR Publishers.

Desmet, P. and Hekkert, P. (2007) 'Framework of Product Experience', *International Journal of Design*, 1(1), pp. 57–66.

Dewey, J. (2005) *Art As Experience*. Perigee Books.

Dindler, C. and Iversen, O. S. (2007) 'Fictional Inquiry—design collaboration in a shared narrative space', *CoDesign*, 3(4), pp. 213–234. doi: 10.1080/15710880701500187.

Djajadiningrat, J. P., Gaver, W. W. and Fres, J. W. (2000) 'Interaction relabelling and extreme characters: methods for exploring aesthetic interactions', in *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques*, pp. 66–71. Available at: http://dl.acm.org/citation.cfm?id=347664 (Accessed: 27 May 2013).

Dolan, P. (2014) *Happiness by Design: Change What You Do, Not How You Think*. New York, New York: Avery Pub Group.

Dorst, K. (2003) 'The problem of design problems', *Expertise in design*, pp. 135–147.

'Droog – the design tells the story | D*Hub' (no date). Available at: https://www.dhub.org/droog-the-design-tells-the-story/ (Accessed: 15 January 2018).

Dukic, G. (2007) *Wristcutters: A Love Story*.

Dunne, A. (2008) *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*. MIT Press.

Dunne, A. (2013) *Speculative everything: design, fiction, and social dreaming*. Cambridge, Massachusetts: The MIT Press.

Dunne, A. and Raby, F. (2001) *Design Noir: The Secret Life of Electronic Objects*. August/Birkhauser.

Duxbury, N., Garrett-Petts, W. F. and MacLennan, D. (2015) *Cultural Mapping as Cultural Inquiry*. Routledge.

Ekman, P. (2014) 'Expression and the Nature of Emotion', in Scherer, K. R. and Ekman, P. (eds) *Approaches to Emotion*. Psychology Press, pp. 319–344. Available at: https://www.paulekman.com/wp-content/uploads/2013/07/Expression-And-The-Nature-Of-Emotion.pdf (Accessed: 16 September 2015).

Fallman, D. (2008) 'The interaction design research triangle of design practice, design studies, and design exploration', *Design Issues*, 24(3), pp. 4–18.

Fludernik, M. (2002) *Towards a 'Natural' Narratology*. Routledge.

Fokkinga, Steven and Desmet, P. (2012) 'Darker shades of joy: The role of negative emotion in rich product experiences', *Design Issues*, 28(4), pp. 42–56.

Fokkinga, S. and Desmet, P. (2012) 'Meaningful Mix or Tricky Conflict? A Categorization of Mixed Emotional Experiences and Their Usefulness for Design', in. *8th International Conference on Design and Emotion*.

Forlizzi, J. (1997) *Designing for Experience: An Approach to Human-centered Design*. Department of Design, College of Fine Arts, Carnegie Mellon University,. Available at: http://goodgestreet.com/docs/forlizziMDes.pdf (Accessed: 7 December 2012).

Forlizzi, J. and Ford, S. (2000) 'The building blocks of experience: an early framework for interaction designers', in *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques*, pp. 419–423. Available at: http://dl.acm.org/citation.cfm?id=347800 (Accessed: 27 May 2013).

Fox, K. (2005) *Watching the English: The Hidden Rules of English Behaviour*. Boston: Hodder & Stoughton.

Frayling, C. (1993) *Research in Art and Design*. Royal College of Art Research Papers (1). Available at: http://researchonline.rca.ac.uk/384/3/frayling_research_in_art_and_design_1993.pdf (Accessed: 1 February 2016).

Frost, N. (2009) '`Do you know what I mean?': the use of a pluralistic narrative analysis approach in the interpretation of an interview', *Qualitative Research*, 9(1), pp. 9–29. doi: 10.1177/1468794108094867.

Gaver, B., Dunne, T. and Pacenti, E. (1999) 'Design: Cultural Probes', *interactions*, 6(1), pp. 21–29. doi: 10.1145/291224.291235.

Gaver, W. (2006) *Curious things for curious people*. Press. Available at: https://jupiter.gold.ac.uk/media/36.gaver.curiousThings.inPress.pdf (Accessed: 31 December 2012).

Gaver, W., Dunne, T. and Pacenti, E. (1999) 'Cultural probes and the value of uncertainty', *interactions*, 6(1), pp. 21–29.

Gaver, W. W., Beaver, J. and Benford, S. (2003) 'Ambiguity as a resource for design', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. New York, NY, USA: ACM (CHI '03), pp. 233–240. doi: 10.1145/642611.642653.

Gell, A. (1998) *Art and agency: an anthropological theory*. Clarendon Press.

Genette, G. (1980) *Narrative discourse*. Cornell University Press.

Gibson, J. J. (1986) *The Ecological approach to visual perception*. Hillsdale (N.J.): Lawrence Erlbaum Associates.

Gill, S. P. (2015) 'Tacit engagement', in *Tacit Engagement*. Springer, pp. 1–34.

Glenn, J. and Walker, R. (eds) (2012) *Significant Objects*. Original. Fantagraphics.

Govers, P. C. and Mugge, R. (2004) 'I love my jeep, because it's tough like me': The effect of product-personality congruence on product attachment', in *Proceedings of the Fourth International Conference on Design and Emotion, Ankara, Turkey*. Available at: http://www.pascallegovers.nl/uploads/1/2/3/9/12391484/govers_and_mugge_de2004.pdf (Accessed: 16 September 2015).

Green, W. S. and Jordan, P. W. (2002) *Pleasure with Products: beyond usability*. 1st edn. CRC Press.

Grimaldi, S. (2006) 'The Ta-Da Series: presentation of a technique and its use in generating a series of surprising designs', in. *5th International Design and Emotion Conference*, Chelmers University of Technology, Goteborg Sweden. Available at: http://arts.academia.edu/SilviaGrimaldi/Papers/543797/The_Ta-Da_Series_-_Presentation_of_a_methodology_and_its_use_in_generating_a_series_of_surprising_designs (Accessed: 30 January 2012).

Grimaldi, S. (2008) 'The Ta-Da Series – A Technique for Generating Surprising Designs Based on Opposites and Gut Reactions', in Desmet, P. M. A. and Karlsson, J. van E. and M., *Design and Emotion Moves*. Edited by P. M. A. Desmet and J. van E. Karlsson. Cambridge Scholars Publishing.

Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences. Methods for Cross-Media Fertilisation of the Design Process', in *Proceedings of 8th International Design and Emotion Conference London 2012 Central Saint Martins College of Arts & Design*. London.

Grimaldi, S. (2013) 'Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions.', in Brandt, E. et al. (eds) *Nordes 2013: Experiments in design research Online proceedings 9-12 June 2013 Published in 2013 by The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation*. Copenhagen-Malmö.: www.nordes.org, pp. 374–377.

Grimaldi, S. (2015) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in *Experience Design: Concepts and Case Studies*. London ; New York: Bloomsbury Academic, pp. 57–68.

Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) *The Routledge Handbook of Sustainable Product Design*. Routledge/Taylor & Francis. Available at: http://www.tandfindia.com/books/details/9781138910171/ (Accessed: 21 February 2017).

Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in *Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces*. New York, NY, USA: ACM (DPPI '13), pp. 201–210. doi: 10.1145/2513506.2513528.

Hall, E. T. (1959) *The silent language*. Doubleday New York.

Hassenzahl, M. (2010) 'Experience Design: Technology for all the right reasons', *Synthesis Lectures on Human-Centered Informatics*, 3(1), pp. 1–95.

Hassenzahl, M. (2011) 'User Experience and Experience Design', *Lecture Notes in Computer Science*. Edited by M. Soegaard and Dam, pp. 1–19.

Hayward, S. (2013) *Philosophical Toys Exhibition Guide, London Design Festival 2013*. Available at: https://www.academia.edu/4365367/Philosophical_Toys_Exhibition_Guide_London_Design_Festival_2013 (Accessed: 19 December 2013).

Herman, D. (2004) *Story Logic: Problems and Possibilities of Narrative*. Univ of Nebraska Pr.

Herman, D. (2007) 'Storytelling and the Sciences of Mind: Cognitive Narratology, Discursive Psychology, and Narratives in Face-to-Face Interaction', *Narrative*, 15(3), pp. 306–334. doi: 10.1353/nar.2007.0023.

Herman, D. (2009) 'Narrative ways of worldmaking', in Heinen, S. and Sommer, R. (eds) *Narratology in the Age of Cross-Disciplinary Narrative Research*. Walter de Gruyter, pp. 71–87.

Herman, D. (2013a) 'Cognitive Narratology (revised version; uploaded 22 September 2013)', in Hühn, P. (ed.) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press. Available at: http://www.lhn.uni-hamburg.de/article/cognitive-narratology-revised-version-uploaded-22-september-2013 (Accessed: 1 April 2014).

Herman, D. (2013b) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press. Available at: http://www.lhn.uni-hamburg.de/article/cognitive-narratology-revised-version-uploaded-22-september-2013 (Accessed: 1 April 2014)

Hogan (2009) *The Mind and its Stories: Narrative Universals and Human Emotion*. Cambridge University Press.

Ingold, T. (2000) *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. Routledge.

Jones, J. C. (1970) *Design Methods: Seeds of Human Futures*. London: Wiley-Interscience.

Jones, J. (2014) 'Kurt Vonnegut Diagrams the Shape of All Stories in a Master's Thesis Rejected by U. Chicago', *Open Culture*. Available at: http://www.openculture.com/2014/02/kurt-vonnegut-masters-thesis-rejected-by-u-chicago.html (Accessed: 19 December 2016).

Jordan, P. W. (1998) *An Introduction to Usability*. 1st edn. CRC Press.

Jordan, P. W. (2000) *Designing Pleasurable Products: An Introduction to the New Human Factors*. London: Taylor & Francis.

Jordan, P. W. *et al.* (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', *The Design Journal*, 20(sup1), pp. S4292–S4306. doi: 10.1080/14606925.2017.1352926.

Karapanos, E. *et al.* (2009) 'User experience over time: an initial framework', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 729–738. Available at: http://dl.acm.org/citation.cfm?id=1518814 (Accessed: 27 May 2013).

Karapanos, E., Martens, J.-B. and Hassenzahl, M. (2009) 'Accounting for diversity in subjective judgments', in *CHI '09: Proceedings of the 27th international conference on Human factors in computing systems*. New York, NY, USA: ACM, pp. 639–648.

Karapanos, E., Martens, J.-B. and Hassenzahl, M. (2010) 'On the retrospective assessment of users' experiences over time: memory or actuality?', in *CHI'10 Extended Abstracts on Human Factors in Computing Systems*, pp. 4075–4080. Available at: http://dl.acm.org/citation.cfm?id=1754105 (Accessed: 27 May 2013).

Kearney, R. (2002) *On stories*. London; New York: Routledge. Available at: http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN =72340 (Accessed: 24 July 2013).

Kim, J. (2003) *A Tale of Two Sisters*.

Kimbell, L. (2014) *The Service Innovation Handbook: Action-oriented Creative Thinking Toolkit for Service Organizations*. BIS Publishers. Available at: https://www.amazon.co.uk/Service-Innovation-Handbook-Action-oriented-Organizations/dp/9063693532 (Accessed: 20 December 2016).

Koskinen, I., Binder, T. and Redström, J. (2008) 'Lab, Field, Gallery, and Beyond 1', *Artifact*, 2(1), pp. 46–57. doi: 10.1080/17493460802303333.

Laing, R. (2010) *The divided self: An existential study in sanity and madness*. Penguin UK.

Latour, B. (2007) *Reassembling the social: an introduction to actor-network-theory*. Oxford University Press.

Laurel, B. (2004) *Design Research: Methods and Perspectives*. MIT Press.

Lazarus, R. S. (1991) *Emotion and adaptation*. New York, NY, US: Oxford University Press.

Leigh, M. (2004) *Vera Drake*.

Lloyd, P. (2000) 'Storytelling and the development of discourse in the engineering design process', *Design Studies*, 21(4), pp. 357–373.

Löwgren, J. (2009) 'Toward an articulation of interaction aesthetics', *New Review of Hypermedia and Multimedia*, 15(2), pp. 129–146.

Malpass, M. (2013) 'Between Wit and Reason: Defining Associative, Speculative, and Critical Design in Practice', *Design and Culture*, 5(3), pp. 333–356. doi: 10.2752/175470813X13705953612200.

Malpass, M. (2017) *Critical design in context: history, theory, and practices*. London: Bloomsbury Academic.

Mark, M. and Pearson, C. S. (2001) *The Hero and the Outlaw: Building Extraordinary Brands Through the Power of Archetypes*. New York: McGraw-Hill Professional.

Markussen, T. (2017) 'Disentangling "the social" in social design's engagement with the public realm', *CoDesign*, 13(3), pp. 160–174. doi: 10.1080/15710882.2017.1355001.

Markussen, T. and Knutz, E. (2013) 'The Poetics of Design Fiction', in *Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces*. New York, NY, USA: ACM (DPPI '13), pp. 231–240. doi: 10.1145/2513506.2513531.

Markussen, T., Ozcan, E. and Cila, N. (2012) 'Beyond Metaphor in Product Use and Interaction', in. *Design and semantics of form and movement (2012)*, p. 110. Available at:

http://desform2012.schoolofdesign.ac.nz/wp-content/uploads/DeSForM_2012_LR.pdf#page=112 (Accessed: 18 September 2012).

McCarthy, J. and Wright, P. (2010) *Experience-centered design designers, users, and communities in dialogue*. [San Rafael, Calif.?]: Morgan & Claypool.

McCarthy, J. and Wright, P. (2004) *Technology as experience*. The MIT Press.

McDonagh, D. *et al.* (eds) (2003) *Design and Emotion*. London ; New York: CRC Press.

McGilchrist, I. (2009) *The master and his emissary: The divided brain and the making of the western world*. Yale University Press.

McKee, R. (1999) *Story: Substance, Structure, Style and the Principles of Screenwriting*. Methuen Publishing Ltd.

McLuhan, M. (1994) *Understanding media: The extensions of man*. MIT press.

Meister, J. C. (2016) 'Narratology', in Hühn, P. et al. (eds) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press.

Meuter, N. (2016) 'Narration in Various Disciplines', in Hühn, P. et al. (eds) *The Living Handbook of Narratology*. Hamburg: Hamburg University Press.

Miall, D. S. (2011) 'Emotions and the Structuring of Narrative Responses', *Poetics Today*, 32(2), pp. 323–348. doi: 10.1215/03335372-1162704.

Michele L Crossley (2002) 'Introducing Narrative Psychology', in *Narrative, Memory and Life Transitions*. University of Huddersfield, Huddersfield, pp. 1–13.

Miller, D. (2001) *Home possessions: material culture behind closed doors*. Berg.

Miller, D. (2008) *The Comfort of Things*. 1st Edition. Polity Press.

Miller, D. and Parrott, F. (2009) 'Loss and material culture in South London', *Journal of the Royal Anthropological Institute*, 15(3), pp. 502–519. doi: 10.1111/j.1467-9655.2009.01570.x.

Moore, P. (2011) 'D&AD President's Lecture'. London.

Nam, T. and Kim, C. (2011) 'Design by Tangible Stories: Enriching Interactive Everyday Products with Ludic Value', *International Journal of Dsign*. Available at: http://www.ijdesign.org/ojs/index.php/IJDesign/article/view/682 (Accessed: 22 October 2012).

Nicolas, J. C. O. and Aurisicchio, M. (2011) 'The Scanario of User Experience', *DS 68-7: Proceedings of the 18th International Conference on Engineering Design (ICED 11), Impacting Society through Engineering Design, Vol. 7: Human Behaviour in Design, Lyngby/Copenhagen, Denmark, 15.-19.08.2011*.

Norman, D. (1988) *The Psychology of Everyday Things*. New York: Basic Books.

Norman, D. (2002) *The Design of Everyday Things*. 1st Basic Paperback. Basic Books.

Norman, D. A. (2003) *Emotional Design: Why We Love (or Hate) Everyday Things*. 1st edn. Basic Books.

Nussbaum, M. (1988) 'Narrative Emotions: Beckett's Genealogy of Love', *Ethics*, 98(2), pp. 225–254.

Ocnarescu, I. *et al.* (2012) 'AEoT: an Initial Framework of Aesthetic Experience Over Time', in *Out of Control: Proceedings of 8th International Design and Emotion Conference London 2012. Out of Control:8th International Design and Emotion Conference*, London.

Parrish, P. (2006) 'Design as storytelling', *TechTrends*, 50(4), pp. 72–82.

Pässilä, A. and Owens, A. (2016) 'Sensible sensitivity: arts pedagogy in management development', in. Kogan Page.

Polanyi, M. (2009) *The tacit dimension*. University of Chicago press.

Propp, V. I. (1968) *Morphology of the folktale*. University of Texas Press.

Rittel, H. W. and Webber, M. M. (1973) 'Dilemmas in a general theory of planning', *Policy sciences*, 4(2), pp. 155–169.

Robson, C. (2002) *Real World Research: A Resource for Social Scientists and Practitioner-researchers*. 2nd Edition. John Wiley & Sons.

Ryan, M.-L. (2005) 'On the Theoretical Foundations of Transmedial Narratology', in *Narratology beyond Literary Criticism. Mediality, Disciplinarity.* Berlin, New York: de Gruyter.

Ryan, M.-L. (2016) 'Transmedia Narratology and transmedia storytelling', *Artnodes*, (18).

Sacks, O. W. (1998) *The man who mistook his wife for a hat and other clinical tales*. New York: Simon & Schuster.

Sanders, E. B. (2002) 'From user-centered to participatory design approaches', *Design and the social sciences: Making connections*, 1(8).

Sanders, E. B.-N. and Stappers, P. J. (2008) 'Co-creation and the new landscapes of design', *Co-design*, 4(1), pp. 5–18.

Scheer, A., Noweski, C. and Meinel, C. (2012) 'Transforming constructivist learning into action: Design thinking in education', *Design and Technology Education: An International Journal*, 17(3).

Scherer, K. R., Schorr, A. and Johnstone, T. (2001) *Appraisal processes in emotion: Theory, methods, research*. New York, NY, US: Oxford University Press (Series in affective science.).

Schiff, B. (2012) 'The Function of Narrative: Toward a Narrative Psychology of Meaning', *Narrative Works*, 2(1). Available at: http://journals.hil.unb.ca/index.php/NW/article/view/19497 (Accessed: 17 July 2013).

Schifferstein, H. N. J. and Hekkert, P. (2007) *Product Experience*. Elsevier.

Schön, D. A. (1985) *The design studio: An exploration of its traditions and potentials*. International Specialized Book Service Incorporated.

Shainberg, S. (2002) *Secretary*.

Shreeve, A. and Batchelor, R. (2012) 'Designing Relations in the Studio: Ambiguity and uncertainty in one to one exchanges', *Design and Technology Education: an International Journal*, 17(3).

Steffen, D. (2009) 'Meaning and Narration in Product Design', in. International Conference on Designing Pleasurable Products and Interfaces, *DPPI09 13- 16 October 2009, Compiegne University of Technology, Compiegne, France.*

Sterling, B. (2009) 'COVER STORY: Design Fiction', *interactions*, 16(3), pp. 20–24. doi: 10.1145/1516016.1516021.

Stickdorn, M. *et al.* (2018) *This Is Service Design Doing: Using Research and Customer Journey Maps to Create Successful Services*. 1 edition. O'Reilly Media.

Tan, E. S. (1995) *Emotion and the Structure of Narrative Film: Film As An Emotion Machine*. Routledge.

Trowler, V. (2010) 'Student engagement literature review', *The higher education academy*, 11, pp. 1–15.

Wright, P. and McCarthy, J. (2008) 'Empathy and experience in HCI', in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. New York, NY, USA: ACM (CHI '08), pp. 637–646. doi: 10.1145/1357054.1357156.

Yee, J. and Bremner, C. (2011) 'Methodological bricolage: What does it tell us about design?', in. *Doctoral Design Education Conference*, Hong Kong Polytechnic, Hong Kong. Available at: http://nrl.northumbria.ac.uk/8822/ (Accessed: 7 February 2018).

Yee, J. S. R. (2010) 'Methodological Innovation in Practice-Based Design Doctorates', *Journal of Research Practice*, 6(2), p. 15.

Young, K. and Saver, J. L. (2001) 'The neurology of narrative', *SubStance*, 30(1), pp. 72–84.

Ypma, B. E. and Wiedmer, M. (2010) *Fiction in Design Research, Report on the 6th Swiss Design Network Conference in Basle*. Available at: http://www.swissdesignnetwork.org/daten_swissdes

Appendices

Appendix 1: List of Publications and Dissemination events arising from the PhD

Appendix 2: Functions of Narrative in Product Design – long form

Appendix 3: Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces. New York, NY, USA: ACM (DPPI '13), pp. 201–210. doi: 10.1145/2513506.2513528.

Appendix 4: Matrix of Minimum Narrative Definitions

Appendix 5: Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences: Methods for Cross-Media Fertilisation of the Design Process', in Brassett, J. et al. (eds) Out of Control: Proceedings of 8th International Design and Emotion Conference London 2012. London: University of the Arts London. Available at: http://www.designandemotion.org/ (Accessed: 17 October 2017).

Appendix 6: Grimaldi, S. (2014) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in Benz, P. (ed.) Experience Design: Concepts and Case Studies. London: Bloomsbury Academic, pp. 57–68. Available at: http://www.bloomsbury.com/uk/experience-design-9781472569394/ (Accessed: 21 February 2017).

Appendix 7: Grimaldi, S. (2013) 'Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions', in Nordes 2013: Experiments in design research Online proceedings. The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation, pp. 374–377. Available at: http://nordes.org/nordes2013/ (Accessed: 17 October 2017).

Appendix 8: Questionnaire to select objects and answers breakdown

Appendix 9: IMDb forum post and answer breakdown

Appendix 10: Analysis of the four kettle scenes

Appendix 11: Three storyboards from participant interviews

Appendix 12: Design Process Matrix

Appendix 13: Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) *The Routledge Handbook of Sustainable Product Design*. Routledge/Taylor & Francis.

Appendix 14: Full set of design concepts

Appendix 15: Full design process of the 4 kettle prototypes

Appendix 16: Jordan, P. W., Bardill, A., Herd, K., Grimaldi, S. (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', The Design Journal, 20(sup1), pp. S4292–S4306. doi: 10.1080/14606925.2017.1352926. (Peer Reviewed)

Appendix 17: Ali, H., Grimaldi, S. and Biagioli, M. (2017) 'Service Design pedagogy and effective student engagement: Generative Tools and Methods', The Design Journal, 20(sup1), pp. S1304–S1322. doi: 10.1080/14606925.2017.1352659. (Peer Reviewed).

Appendix 18: Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process, in Design Research Society Conference Proceedings, DRS2018, Limerick, Ireland.

Appendix 19: Narratives in Design Toolkit 2 as used in Case Study 2.

Appendix 20: Sample transcripts and qualitative analysis.

Appendix 21: Videos of the four kettle prototypes, on USB drive.

Design for Narrative Experience in Product Interactions

Silvia Grimaldi

A Thesis submitted in partial fulfilment of the requirements for the degree of PhD at the University of the Arts London

July 2018

Appendices

Appendices

Appendix 1: List of Publications and Dissemination events arising from the PhD

Appendix 2: Functions of Narrative in Product Design – long form

Appendix 3: Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces. New York, NY, USA: ACM (DPPI '13), pp. 201–210. doi: 10.1145/2513506.2513528.

Appendix 4: Matrix of Minimum Narrative Definitions

Appendix 5: Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences: Methods for Cross-Media Fertilisation of the Design Process', in Brassett, J. et al. (eds) Out of Control: Proceedings of 8th International Design and Emotion Conference London 2012. London: University of the Arts London. Available at: http://www.designandemotion.org/ (Accessed: 17 October 2017).

Appendix 6: Grimaldi, S. (2014) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in Benz, P. (ed.) Experience Design: Concepts and Case Studies. London: Bloomsbury Academic, pp. 57–68. Available at: http://www.bloomsbury.com/uk/experience-design-9781472569394/ (Accessed: 21 February 2017).

Appendix 7: Grimaldi, S. (2013) 'Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions', in Nordes 2013: Experiments in design research Online proceedings. The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation, pp. 374–377. Available at: http://nordes.org/nordes2013/ (Accessed: 17 October 2017).

Appendix 8: Questionnaire to select objects and answers breakdown

Appendix 9: IMDb forum post and answer breakdown

Appendix 10: Analysis of the four kettle scenes

Appendix 11: Three storyboards from participant interviews

Appendix 12: Design Process Matrix

Appendix 13: Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) *The Routledge Handbook of Sustainable Product Design*. Routledge/Taylor & Francis.

Appendix 14: Full set of design concepts

Appendix 15: Full design process of the 4 kettle prototypes

Appendix 16: Jordan, P. W., Bardill, A., Herd, K., Grimaldi, S. (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', The Design Journal, 20(sup1), pp. S4292–S4306. doi: 10.1080/14606925.2017.1352926. (Peer Reviewed)

Appendix 17: Ali, H., Grimaldi, S. and Biagioli, M. (2017) 'Service Design pedagogy and effective student engagement: Generative Tools and Methods', The Design Journal, 20(sup1), pp. S1304–S1322. doi: 10.1080/14606925.2017.1352659. (Peer Reviewed).

Appendix 18: Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process, in Design Research Society Conference Proceedings, DRS2018, Limerick, Ireland.

Appendix 19: Narratives in Design Toolkit 2 as used in Case Study 2.

Appendix 20: Sample transcripts and qualitative analysis.

Appendix 21: Videos of the four kettle prototypes, on USB drive.

Appendix 1: List of Publications and Dissemination events arising from the PhD

Appendix 1 Publications arising from this PhD

Publications and other dissemination events

Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process, in Design Research Society Conference Proceedings, DRS2018, Limerick, Ireland. (peer reviewed and accepted to be published in the proceedings; forthcoming)

Narratives in Design Toolkit, for Experience Design Journal – story track. Invited to submit by the editor for the first issue. (Peer reviewed and accepted for publication; forthcoming).

Jordan, P. W., Bardill, A., Herd, K., Grimaldi, S. (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', The Design Journal, 20(sup1), pp. S4292–S4306. doi: 10.1080/14606925.2017.1352926. (Peer Reviewed).

Ali, H., Grimaldi, S. and Biagioli, M. (2017) 'Service Design pedagogy and effective student engagement: Generative Tools and Methods', The Design Journal, 20(sup1), pp. S1304–S1322. doi: 10.1080/14606925.2017.1352659. (Peer Reviewed).

Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) The Routledge Handbook of Sustainable Product Design. Routledge/Taylor & Francis. (Invited chapter).

November 2014 Delivered lecture and workshops on Narratives in Design Toolkit as part of an Erasmus+ exchange with Kolding School of Design in Denmark.

Grimaldi, S. (2014) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in Benz, P. (ed.) Experience Design: Concepts and Case Studies. London: Bloomsbury Academic, pp. 57–68. (Peer Reviewed).

February 2014 Dark City: Workshop on Design Fiction for Sustainability – developed with Thomas Markussen and Eva Knutz of Kolding School of Design in Denmark as part of an Erasmus+ exchange, and delivered to University of the Arts students as part of the Green Week programme.

Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces. New York,

NY, USA: ACM (DPPI '13), pp. 201–210. doi: 10.1145/2513506.2513528. (Peer Reviewed and published in the proceedings).

Grimaldi, S. (2013) 'Story of use: Analysis of film narratives to inform the design of object interactions', in Nordes 2013 Experiments in Design Research. Nordes 2013, The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation.

November 2013 – workshop at TU Delft, ID Studiolab devising a framework to analyse narrative use in design. This resulted in a presentation to the ID Studiolab community as well as in the paper entitled Narratives in Design co-authored with TU Delft and Arts et Metiers Paris and Bell Labs researchers.

November 2013 – Invited presentation on the theme "How I met narrative" for the *Narrative in Practice Symposium*, NiP2013, London, UK.

Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences. Methods for Cross-Media Fertilisation of the Design Process', in Proceedings of 8th International Design and Emotion Conference London 2012 Central Saint Martins College of Arts & Design. London. (Peer Reviewed and published in the proceedings).

June 2012 Designing Narrative Product Interactions: Initial methods for cross-media inquiry and theoretical positioning presentation as part of the Research Network University of the Arts London.

Other relevant design research events and workshops:

Chaired The Craft of Service Design event as part of the Service Design Fringe, London Design Festival 2017.

August 2016 Theatre in Design International Seminar and PhD Summer School Week-long seminar and PhD training course run by the University of Southern Denmark, Kolding, Denmark.

2016 Peer Reviewer for the 10th International Conference on Design and Emotion, held in Amsterdam in September 2016.

2015 Peer Reviewer for the Journal of Design Research Inderscience Publishers.

September 2014-May 2015 Participated in the Cultures of Resilience project within University of the Arts London run by Ezio Manzini and Jeremy Till. Booklet available here http://www.culturesofresilience.org/wordpress/wp-content/uploads/2015/03/CoR-Booklet-forHomePrinting.pdf

2015 Peer Reviewer for the Journal of Engineering Design Special Issue on Experience and Interaction. Publication date: May 2015

2014 Peer Reviewer for the Designing Experience Conference held in Hong Kong in November 2014

November 2013 AHRC funded SKIP Workshop on Design Ethnography Week-long course for research students run by the Royal College of Art, University of the Arts and Kingston University.

Appendix 2: Functions of Narrative in Product Design – long form

Appendix 2 Functions of Narrative in Product Design – long form

Functions of Narrative in Product Design: Why is narrative used in product design, and to what effect?

The following section presents a classification of a number of examples from product design literature. These were selected because the author of the paper or the designer have identified a narrative process or technique within the cited example. Each function or effect of narrative use within the design is listed in the table below and the key features are teased out.

1. Communication and Conveying Information			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Cyrrus Technologies (Lloyd, 2000)	Storytelling used in design team to frame information in communications between team members.	Usage Scenarios and instructions	Information on how to use a product is often presented in story form though comic-book like instructions.
Fictional Inquiry (Dindler and Iversen, 2007)	Pre-scripted narrative used to mediate information given to participants in co-design workshop, and as a format for participant feedback.	*Do Design* (Taylor, 2013)	The performative nature of the products was presented to the user through a series of humorous vignettes featuring exaggerated characters using the products.

2. Evoking Reflectivity			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Design Fiction (Ypma, 2010) (Markussen and Knutz, 2013)	Design Fiction helps designers reflect on future scenarios by removing constraints relevant to our current world.	Gamper, *100 Chairs in 100 Days* (in Malpass, 2013)	Associative design subverts user's or audience's ideas through archetypes
		Design Noir (example: Nipple Chair) (Dunne and Raby, 2001)	Ambiguous products force users to try to understand their function or meaning
		Philosophical Toys (Hayward, 2013)	Exhibition of objects that promote critical thinking through design

3. Showing and Teaching Values			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Cyrrus Technologies (Lloyd, 2000)	Narratives used in the design process to show do's and don'ts or relate past mistakes	Auger's *Smell +: Dating and Genetic Compatibility Smell Blind Date*. (in Malpass, 2013)	Speculative design forces viewer/user to question current society's values

4. Empathy, Identification and Bypassing Social Structures			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**

Blythe & McCarthy's *Technology Biography*, Gaver's *Cultural Probes* and Blythe's *Pastiche Scenarios* (all in McCarthy and Wright, 2010)	Narrative allows designers to empathise with user represented in stories in an emotional as well as pragmatist way.	*The Comfort of Things* (Miller, 2008)	Through ethnographic studies the identification of people with their possessions is seen through narratives of shared experience and origin of the artefacts.
Narrative Inquiry (Danko, 2006)	Incorporating narrative into different stages of interior design students' design process the final designs were more human and empathic.		
Fictional Inquiry (Dindler and Iversen, 2007)	Participants in co-design workshops used fictional roles to work with each other across age, education and social class boundaries		

5. Imagination and Creativity			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Cultural Probes (Gaver et al., 2003)	Cultural Probes are useful research tool for designers because the ambiguity of the results give glimpses of personality which shows new perspectives and possibilities	*Significant Objects* (Glenn and Walker, 2012)	Sold cheap charity shop objects on ebay with a story attached; the objects increased in monetary value showing that the buyers were finding new ways of valuing the objects prompted by the story.
Design as Storytelling (Parrish, 2006)	Writing user scenarios in the form of "design stories" makes them more relevant to designers because they engage better with the characters.		

6. Memorability			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Invisible Design (Briggs et al., 2012)	Filmed conversations between actors describing products in context help elderly product testing group participants remember the designs when giving feedback	*Ta-Da Series* (Grimaldi, 2008)	Created a more memorable product experience through using surprise to structure a narrative of use.
		Brand narratives (Steffen, 2009)	Role of brand narratives in the memorability of products
		Narratives in user experience (Forlizzi and Ford, 2000)	Engaging narratives within a product experience can help make the product more memorable and talked about

7. Engaging and Delighting			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Invisible Design (Briggs et al., 2012)	Filmed narratives engaged and delighted the members of the product testing group, leading to livelier conversation.	*Ta-Da Series*, in particular the *On-Edge Lamp* (Grimaldi, 2008)	Product experience is enriched by the delight of users engaging with product
Fictional Inquiry (Dindler and Iversen, 2007)	Narratives used in a co-design workshop engaged and delighted participants.	*Anna G corkscrew by Alessi* (Markussen et al., 2012)	Product metaphors used in the design delight the user and foster interpretation

8. Persuading			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Inclusive Design (Moore, 2011)	Narratives created through impersonating an elderly person in real life situations persuaded design teams to work in a more inclusive way.	Branding and advertisement	Narratives created through branding and advertisements persuade users that one product is superior to another

9. Cohesion and Comprehension			
Examples in the design process	**Key features**	**Examples in product use**	**Key Features**
Design as Storytelling (Parrish, 2006)	Storytelling as a way of testing how different elements of a design might work together	*Freya's Cabin* by Studio Weave (Ahn and Smith, 2011)	Storytelling is used throughout the whole design process and is integral to understanding the design.

This categorisation is not meant to exclude particular reasons for using narrative from the examples, and it is acknowledged that effects and motivations for narrative use within product design are often multi-layered and complex. However, some examples show a particular effect more clearly than others and have therefore been used to illustrate that particular effect. Though this is a limitation in terms of which examples appear in which category, in effect it allows for a clear analysis and outline of narrative use within products. Below, a few examples of products will be analysed in more detail according to the above classification to show how this can be used as an analytical tool.

NF1 Communicating and Conveying Information

Example of function in design process

Designers and researchers use narratives to communicate insights more clearly and effectively, for instance in persona stories, context stories, or stories about current product use. Lloyd (Lloyd, 2000)conducted ethnographic studies within an engineering design and manufacturing firm, *Cirrus Technologies* in the UK. Lloyd describes how storytelling is used in engineering design firms as a way to frame information in communications between different members of a design team and between design team and client. By recalling the story of a past problem, the information about the problem does not need to be conveyed in full every time a similar problem comes up within the same team.

Dindler and Iversen describe their process of Fictional Inquiry (Dindler and Iversen, 2007) within a number of participant workshops. They describe a workshop at a marine centre with participants from different ages aimed at creating compelling visitor experiences that could be incorporated into future developments at the marine centre. A pre-scripted narrative was used as a way of mediating communication within groups of different participants in participant design projects. The narrative is used to frame the information given to the participants at the beginning of the workshop but also to frame the stages of the workshop and describe the participant's involvement. In turn, the participant's ideas are also presented back to the workshop organisers in the form of a narrative. The initial narrative is constructed around familiar "types" so that it is accessible to the particular participants.

Example of function in product use

Narratives can be used to communicate to users about how they can use their products, for instance in usage scenarios or in the most common instance in instruction for use. In Droog's project Do Create (Taylor, 2013) presents a series of objects which after being acquired need to be "finished" or customised by the user. One example is the *Do Hit* chair by Marijn van der Poll, which is purchased as a welded steel cube and comes with a large camera. The accompanying images show that you need to use the hammer to bask the cube into a sofa shape, which can be

customised to your own preference. The focus here though is actually on the way the images are presented; each object in the *Do Create* series comes with a series of images, presenting strong stereotyped characters performing the actions that need to be communicated to the user. The *Do Hit* chair for example is presented in a traditional living room with a middle aged, overweight, slightly disheveled looking man with sweaty armpit patches leaning on his hammer standing next to the freshly bashed chair.

In critical design objects often come accompanied by some sort of narrative which describes how the object is meant to be used, usually in the form of a usage scenario. An example cited in Malpass (Malpass, 2013) is Björn Franke's Traces of an Imaginary Affair: the objects in the series are ambiguous devices to create scratches and marks on the user that resemble those created by an overzealous lover. The images used to present these devices though are set within a usage scenario of bedrooms with undone bedcovers and anonymous users in ruffled business attire.

NF2 Evoking reflectivity

Example of function in design process

User or product narratives that involve an unusual situation or some kind of conflict can be used by designers to highlight design problems or cultural issues. Ypma and Wiedmer (Ypma and Wiedmer, 2010) report on the 6th Swiss Design Network Conference in Basle in 2010 about a number of speakers using Design Fiction as a way to make designers reflect on future scenarios as well as distinguishing between Design Fictions that propose futuristic scenarios and those that encourage designers to reflect upon how they think they can influence the world to become more attuned to a "positive" fiction. Markussen and Knutz (Markussen and Knutz, 2013) also describe the role of Design Fiction in imagining and reflecting on possible future scenarios, and describe a series of workshops that empower students to design for possible futures. Markussen and Knutz's specific approach focuses on using fiction written by a Danish science fiction author in order to help students build scenarios for design.

Example of function in product use

In critical design, narratives are used to make users reflect on their own lives, habits and values. For example Tony Dunne, in his project Hertzian Tales, produced products that prompted the users to reflect on the role of technology in their lives, their inherent fears of electromagnetic waves and their interpretation of things that are unseen. This was then tested by giving the objects to people to "adopt" and then test the way in which the objects prompted reflection through interviews with the participants (Dunne, 2008). The recent exhibition Philosophical Toys has highlighted those aspects of critical design which encourage the user or the audience to reflect upon their experience or on the significance of the objects shown (Hayward, 2013). An example from this exhibition is Rohan Chabbra's Hunter Jacket-Tiger, a hunting jacket that can be hung on the wall in the shape of an endangered animal's head in the style of a hunting trophy; this makes the user or viewer reflect on the ethics of hunting, as well as the hunter's status as an endangered species. Matt Malpass also highlights the role of narrative in critical and speculative design as a way to engage the user in reflection and dialogue about wider issues and to question society's values (Malpass, 2013).

NF3 Showing/ teaching values

Example of function in design process

Narratives can be used in the design process to show certain do's and don'ts of user-product interaction, for instance in horror stories of past products.

Example of function in product use

Narratives, such as those used by movements like cradle-to-cradle or modernism, can be used to convey the ideological purposes of the products they set forth.

Malpass identifies how narrative is used in critical design as a way of challenging society's values and engaging the user or viewer (viewer is used to refer to a gallery or museum context in which this type of design is often experienced) in rethinking their

particular values in light of current society or possible futures. In particular he cites Dunne and Raby's exhibition *Is this your future?* At the Science Museum as an example of critical design that encourages the audience to rethink their values in relation to energy production and child labour when confronted with a possible future, represented in the exhibition, in which humans would be turned from energy consumers into energy producers.

NF4 Empathy, Identification & Bypassing social structures

Example of function in design process

User or persona narratives, ethnographic approaches to design and user research are often used to achieve a greater empathy with real users than could be obtained with target group data. Wright and McCarthy (Wright and McCarthy, 2008) explore the role of empathy in the design process in depth in their paper *Empathy and Experience in HCI*. Citing Blythe and McCarthy's technique of *Technology Biography*, Gaver's *Cultural Probes*, and Blythe's *Pastiche Scenarios* they argue that narrative allows the designers to empathise with the user represented in the stories in both an emotional and a pragmatist way, understanding what it feels like to be the user, but also allowing the designer to conceptualise and work with everyday experience. Sheila Danko (Danko, 2006)describes a method used with interior design students to incorporate narrative into different stages of the design process, programming, conceptualisation and presentation. This was followed by interviews with the participating students who self-reported a higher engagement and empathy with users both through the design process and in the final designs, as well as a change in approach for future design work. Danko identifies three root causes for the heightened empathy displayed by students after using narrative methods: narratives shift the focus from product to person; narratives embrace multiple viewpoints and extend perception; narratives build shared goals and a community of respect within the student group. Dindler and Iversen (Dindler and Iversen, 2007) also talked about fact that their *Fictional Inquiry* technique allowed the participants in co-design workshops to communicate with each other more easily, in this case bypassing traditional social boundaries and structures and empathising with very different

types of people within their co-design group, comprised of children, adults, designers, scientists, members of the public, etc.

Example of function in product use

Personal narratives that a user attaches to an object, for instance its history, or who they received it from, can greatly increase the perceived value of the object. In *The Comfort of Things* Miller (Miller, 2008) describes a number of domestic environments and the significance of objects to the environment's inhabitants, and often these objects are embedded with narratives that come from shared experience of family members and stories of the origin of objects. Not only does this approach facilitate empathy for the researcher and the reader towards the people depicted in the book, but the participants to the book's ethnographic study clearly identify with their personal objects in meaningful ways and use their objects to communicate something about their identity to visitors and family members.

NF5 Imagination & Creativity

Example of function in design process

Narratives can be used by designers to spark imagination and increase creativity. Gaver et al. (Gaver et al., 1999) describe their original intended use for cultural probes in the paper *Cultural Probes and the Value of Uncertainty*. They argue that the purpose of the probes is not to conduct scientific research which can be analysed and interpreted in a conventional way in order to find out about the target demographic for a product; the goal is instead to receive glimpses of personality through the different probes, to immerse the designers within these glimpses of a participant's personality, and to have the designers tell stories about the participants. This narrative engagement is seen by Gaver et al. to create new perspectives for designers and open up the possibilities within the design process. In particular the authors underline the fact that unexpected results from the use of cultural probes can be the most inspiring in the design process. Parrish (Parrish, 2006) talks about storytelling used in the design process as a way to bring disparate elements together

and test the potential of how hose elements would interact. He then describes the process of writing a *design story* as a way of constructing a user scenario that is more relevant and informative to designers, because it allows designers to engage more with the character described.

Example of function in product use

Product narratives can inspire users to new ways of using the products, or even new ways of fitting the products in their lives. One example of this is the recent project *Significant Objects,* documented Glenn and Walker's book by the same name (Glenn and Walker, 2012). The project aim was to measure the increase in retail value of an object when accompanied by a story. To test this the authors bought a number of cheap trinkets from second hand shops, and then commissioned writers to write a story about the objects. The objects were then posted on Ebay for sale and the story was used as the product description. The objects sold on Ebay for a lot more than what they were purchased for, an increase attributed to the accompanying story. It is interesting to note that the story was freely available online, so was not the item being purchased; but the objects themselves took on a different role for the buyer, who, prompted by the story, found different ways of using and interpreting the objects.

NF6 Memorability

Example of function in design process

User insights that take the form of a narrative are easier to remember and to engage with than facts or bullet points. Briggs et al in their paper *Invisible Design* (Briggs et al., 2012) describe a project in which they used films about futuristic products as prompts to engage with the potential users of the products. The premise is that the films show conversations between people about products at a very early stage of the design process, when the concept is still very raw and not embodied into a physical form yet. The authors used the filmed conversations between actors as a way to not only engage with their target audience, in this case pensioners, but also as a way to

make the concept description more relevant to the audience and more memorable within the following discussions.

Example of function in product use

Narratives attached to or created through a product increase the memorability of product experience, and increase word of mouth. Grimaldi (Grimaldi, 2008) describes how, through creating a product experience that is similar to a narrative, the resulting lamp, stool and coffee tables result more memorable and the product experience is more prone to being narrated. Steffen discusses the role of brand narratives in the memorability of products, and goes as far as describing particularly successful brand narratives as myths, putting products into context. (Steffen, 2009) Forlizzi and Ford (Forlizzi and Ford, 2000) describe how an engaging narrative within a user experience can help to make a product more memorable and increase the user's propensity to talk about the object and share it with others.

NF7 Engaging & Delighting

Example of function in design process

Narratives that not just inform but also delight, increase the chance to be used frequently and effectively by the design team. An example of this is the project *Invisible Design* by Briggs et al (Briggs et al., 2012). In this project (described above) Briggs et al. used professional filmmakers to construct narrative films around a technology in the very early stages of design. This allowed the design team to present the target audience with a film which engaged the audience more than a focus group would have and sparked interesting conversations. In the paper *Design by Tangible Stories* Nam and Kim (Nam and Kim, 2011) describe using characters as a starting point for the design of objects, and the object and the output always incorporates a graphic representation of the creatures in the final object. In Dindler and Iversen's *Fictional Inquiry* project, described above, the use of narrative in the co-design process also engages and delights the co-design participants (Dindler and Iversen, 2007).

Example of function in product use

Narratives, either as part of a product or external to it, can enrich the user experience. The example cited above of *Design by Tangible Stories* is an example of engaging and delighting through narrative in product use as well; this technique was used in the design process to inform the designed objects, but the designed objects also incorporate representations of the characters which change according to how the product is used to engage end delight the user. For example, the *Toast-cope* toaster contains four characters which are displayed on a screen on the front of the toaster and these provide information about your bread toasting while also entertaining the user while waiting for the bread to toast (Nam and Kim, 2011). Grimaldi's *Ta-Da Series* creates three objects based around the idea of surprises in the product experience and the designers embeds a narrative of use which takes the user through a story of changing expectations, from an initial negative expectation of the object and its function to a final positive understanding of the intention of the object and the designer (Grimaldi, 2008).

The VolksWagen sponsored *The Fun Theory* project investigates the use of fun in everyday objects to make them more engaging ("The World's Deepest Bin | The Fun Theory," n.d.). One example, *The World's Deepest Bin* uses sound to create the impression that a regular street-side litter bin actually leads to a very long drop - with cartoon-like sound effects. This not only delights the user but creates an imaginary world through the sound, which could be considered a form of evoking narrative in the user.

NF8 Persuading (including lying)

Example of function in design process

Narrative can be used to persuade a design team to work in a certain way. Patricia Moore, in her D&AD Presidential Lecture in 2011 (Moore, 2011), used storytelling tone and technique to persuade designers and design students of the importance of designing for all sorts of audiences, not only able-bodied young males. She used

anecdotes from her experience of being the only female designer within an all male industrial design studio in the USA in the 70's as well as stories about her experience of dressing up as a ninety year old woman and experiencing the world through this different perspective and how this influenced her practice as a designer (Moore and Conn, 1985). Studio Weave, in a lecture in 2011 (Ahn and Smith, 2011) described how they construct stories for each of their design projects before they start designing, but the story is useful throughout the design and construction process to persuade clients and manufacturers of the importance of particular design choices, even when these result in additional costs, because they are coherent with the original narrative.

Example of function in product use

The most ubiquitous example of using narrative to persuade users is that of advertising, in which narrative is used to persuade users that a particular product is superior to another, or to establish a series of associations between a particular brand and a particular lifestyle, which will have an impact on product use. Karapanos (Karapanos et al., 2009) conducted longitudinal studies on IPhone owners over the course of the first four weeks of ownership. Though the studies are not directly related to the impact of advertising and brand, Karapanos addresses ideas of expectations and the impact these have on the experience of using a product, and ideas of the users feeling part of a shared community or lifestyle based on owning the IPhone. These have an impact on the overall assessment of the product.

NF9 Cohesion and comprehension

Example of function in design process

Narrative can be use in the design process to present information to designers in a coherent way that is easier to assimilate and understand. Blythe and Wright describe a technique for building scenarios that may be more useful for designers because they come with additional levels of information. The *Pastiche Scenarios* use characters from well known fiction, such as *A Clockwork Orange* and *Nineteen Eighty-Four* in order to create scenarios that are richer or information that what could be achieved

with blander personas. Because these characters are already well known, this aids immediate comprehension from the people involved in the design process. It also allows people to tap into the backstory and contextualise the characters, which might bring up additional opportunities for design (Blythe and Wright, 2006). In *The Poetics of Design Fiction* Markussen and Knutz (Markussen and Knutz, 2013) describe a method used with students to create a complex fiction based on the scenario taken from a science fiction novel. By using this complex and nuanced piece of writing as a starting point the students are guided through writing exercises to projecting their own mini-scenario within this more complex picture. This allows the student's projects to be more coherent with the scenario and the students understand the scenario better.

Example of function in product use

Narrative can aid the user to remember how an object can be used and what role it might play within their life, as well as helping the user to understand the intention behind the design. Studio Weave (Ahn and Smith, 2011) described how the stories associated to each of their projects help to not only foster their creativity and communicate with stakeholders, but also help to make a coherent experience for the users and visitors, who understand some of the intention behind the design because the story behind it is used to make sure all the elements of the design are coherent.

Bibliography

Ahn, J., Smith, M., 2011. Studio Weave presentation at Narrative in Practice 2011.

Blythe, M.A., Wright, P.C., 2006. Pastiche scenarios: Fiction as a resource for user centred design. Interact. Comput. 18, 1139–1164.

Briggs, P., Blythe, M., Vines, J., Lindsay, S., Dunphy, P., Nicholson, J., Green, D., Kitson, J., Monk, A., Olivier, P., 2012. Invisible design: exploring insights and

ideas through ambiguous film scenarios, in: Proceedings of the Designing Interactive Systems Conference. pp. 534–543.

Danko, S., 2006. Humanizing design through narrative inquiry. J. Inter. Des. 31, 10–28.

Dindler, C., Iversen, O.S., 2007. Fictional Inquiry—design collaboration in a shared narrative space. CoDesign 3, 213–234. doi:10.1080/15710880701500187

Dunne, A., 2008. Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design. MIT Press.

Forlizzi, J., Ford, S., 2000. The building blocks of experience: an early framework for interaction designers, in: Proceedings of the 3rd Conference on Designing Interactive Systems: Processes, Practices, Methods, and Techniques. pp. 419–423.

Gaver, W., Dunne, T., Pacenti, E., 1999. Cultural probes and the value of uncertainty. interactions 6, 21–29.

Glenn, J., Walker, R. (Eds.), 2012. Significant Objects, Original. ed. Fantagraphics.

Grimaldi, S., 2008. The Ta-Da Series – A Technique for Generating Surprising Designs Based on Opposites and Gut Reactions, in: Desmet, P.M.A., Karlsson, J. van E. (Eds.), Design and Emotion Moves. Cambridge Scholars Publishing.

Hayward, S., 2013. Philosophical Toys Exhibition Guide, London Design Festival 2013 [WWW Document]. URL https://www.academia.edu/4365367/Philosophical_Toys_Exhibition_Guide_London_Design_Festival_2013 (accessed 12.19.13).

Karapanos, E., Zimmerman, J., Forlizzi, J., Martens, J.-B., 2009. User experience over time: an initial framework, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. pp. 729–738.

Lloyd, P., 2000. Storytelling and the development of discourse in the engineering design process. Des. Stud. 21, 357–373.

Malpass, M., 2013. Between Wit and Reason: Defining Associative, Speculative, and Critical Design in Practice. Des. Cult. 5, 333–356. doi:10.2752/175470813X13705953612200

Markussen, T., Knutz, E., 2013. The Poetics of Design Fiction, in: Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces, DPPI '13. ACM, New York, NY, USA, pp. 231–240. doi:10.1145/2513506.2513531

Miller, D., 2008. The Comfort of Things, 1st Edition. ed. Polity Press.

Moore, P., 2011. D&AD President's Lecture.

Moore, P., Conn, C.P., 1985. Disguised! Word Books.

Nam, T., Kim, C., 2011. Design by Tangible Stories: Enriching Interactive Everyday Products with Ludic Value. Int. J. Dsign.

Parrish, P., 2006. Design as storytelling. TechTrends 50, 72–82.

Steffen, D., 2009. Meaning and Narration in Product Design. Presented at the INTERNATIONAL CONFERENCE ON DESIGNING PLEASURABLE PRODUCTS AND INTERFACES, DPPI09 13- 16 OCTOBER 2009, COMPIEGNE UNIVERSITY OF TECHNOLOGY, COMPIEGNE, FRANCE.

Taylor, D., 2013. After a Broken Leg: Jurgen Bey's Do Add Chair and the Everyday Life of Performative Things. Des. Cult. 5, 357–374. doi:10.2752/175470813X13705953612246

The World's Deepest Bin | The Fun Theory [WWW Document], n.d. URL http://www.thefuntheory.com/worlds-deepest-bin (accessed 12.19.13).

Wright, P., McCarthy, J., 2008. Empathy and experience in HCI, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08. ACM, New York, NY, USA, pp. 637–646. doi:10.1145/1357054.1357156

Ypma, B.E., Wiedmer, M., 2010. Fiction in Design Research, Report on the 6th Swiss Design Network Conference in Basle.

Appendix 3: Grimaldi, S., Fokkinga, S. and Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice', in Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces. New York, NY, USA: ACM (DPPI '13), pp. 201–210. doi: 10.1145/2513506.2513528.

Narratives in Design:
A Study of the Types, Applications and Functions of Narratives in Design Practice

Silvia Grimaldi
University of the Arts London, UK
s.grimaldi@lcc.arts.ac.uk

Steven Fokkinga
Delft University of Technology, The Netherlands
s.f.fokkinga@tudelft.nl

Ioana Ocnarescu
Alcatel-Lucent Bell Labs
France
ioana.ocnarescu@gmail.com

ABSTRACT

Several design studies have looked at the potential of using narratives to enrich the design process or to create more engaging experiences with designed objects. However, the concept of narrative is still fuzzy and open to interpretations, due to its use and meaning in different disciplines and approaches. In order to deepen the knowledge of narrative use in design, this paper presents three categorizations that survey the what, where and why of narratives in design, respectively. First, it discusses five definitions of narratives based on narrative theory. Secondly, it proposes a typology that classifies the occurrences of narratives in design. Thirdly, it analyses the roles and functions of narratives in designed products and the design process. Finally, using the proposed categorizations, it shows strategies for a narrative approach to design richer experiences for products and discusses techniques for the design process. To conclude, future developments of the project are described, including a call for design projects that involve narratives to be included in a database.

Author Keywords

Narratives; Narrative theory; Experience Design; Design Process;

General Terms

Design; Theory.

INTRODUCTION

In the last few decades, design research has made an increasing use of concepts from psychology, sociology, and humanities, to better understand users and to create more engaging product experiences. One such concept, *narratives*, or *stories*[1], has been the subject of several studies in design research. For example, Steffen discusses how and to what extent 'products can tell a story' [35],

Lloyd explores the importance of storytelling in the engineering design process [24], and Forlizzi and Ford argue how narratives and storytelling are useful concepts in designing better user experiences [13].

There are several reasons for the recent interest of design researchers in narratives. Firstly, narratives play a central role in the way we experience the world: they are 'vehicles' that we use to condense and remember experiences [13], narratives "organize not just memory, but the whole of human experience" [39], and they are crucial for our understanding of time and time-based events [1]. Therefore, it can be argued that many product experiences that are memorable or engaging are mentally structured in narrative form by the user.

Secondly, narratives are one of the most natural ways for people to exchange information, because they evoke more meaning and emotion than bare facts [35, 24]. The philosopher Richard Kearney wrote: "Telling stories is as basic to human beings as eating" [22]. The ability of narratives to communicate ideas and to stimulate imagination allows design to go beyond functional purposes and opens new perspectives to imagine, discuss and propose scenarios for the future as in design fiction [40] or in critical design [11]. Moreover, for certain products, the accompanying narrative is often an essential dimension to create subjective and rich experiences with products. For example, the Tree Trunk-Bench from Droog design is not just a sitting object, but also a manifesto and a story about customization and locally available resources: only the chair backs are for sale and customers are expected to source a local tree trunk to install the backs into; before the object is even delivered to the user's house the user will have had to invest a lot of time and effort into sourcing a tree trunk, thus beginning the story of the object before the object is even in the user's possession [30].

---

[1] We chose in this paper to focus on the term 'narrative', as opposed to the term 'story' or 'storytelling' (which is more commonly used in the field of design [13][31]), because the term 'story' comes laden with connotations from everyday use, and is used in narratology to indicate only a certain aspect of a narrative. Most of the literature [e.g., 1, 4] understands 'story' (also 'fabula' or 'histoire') to be the events that constitute the chronological plot

Thirdly, narratives as manifested in novels, drama and movies, are exceptionally effective in creating engaging and memorable experiences and they are used as a tool to understand our own identity and selves [7]. This point has raised interest to incorporate narratives directly into the user experience of products [19], and to use narrative structures to enrich user experiences: "[designers could] create rich experiences in a way that is similar to writing stories: they can carefully plan different emotional narrative elements through time to compose a holistic and meaningful experience" [12].

Lastly, the creation of narratives is already ubiquitous in the design process of user-centred design. For instance, tools like scenarios, user diaries, personas, and cultural probes use storytelling within design teams to communicate user insights, imagine future contexts, and to stimulate creativity [9, 15, 37]. This paper looks at including within the idea of narrative design not only those designs that use narrative within the design process but also those that deliver a narrative from the user's prospective, predominantly looking at when this was intended by the designer. For example those designs that may function or be structured in a narrative way through the user-product interaction, though they may not deliver an explicit "story".

However, despite the scholarly interest and its considerable use in design practice, there is little systematic study of the different uses of narrative in design, nor a clear definition of the subject. This paper seeks to deepen the knowledge of narrative use in design through *narrative theory* – the study of narrative structure, narrative creation, and its effect on audiences – which was introduced by Aristotle and elaborated by Russian formalism, structuralism, cognitivist approaches and contemporary psychology. This rich tradition, with contributions from numerous authors who proposed new attributes and definitions, offers a wealth of information, but also prevents a straightforward application of its knowledge to the design field. The lack of a clear and single definition makes it challenging to compare the different uses of narratives. From a story as simple as a single user insight to an all-encompassing narrative of a design movement over time, narratives appear in design on vastly different scales and levels, without clear overview of the concept as such.

This paper aims to use insights from narrative theory to define the concept of narratives, to explore the use of narratives in design research, and to show the different functions of narrative in design. In order to take this approach, the paper first reviews specific definitions of narrative from narrative theory literature, to make clear which 'type' of narrative is applied in different design practices. Next, an overview is presented that shows six

of the narrative, as opposed to the way these events are told, referred to as narrative discourse (also 'syuzhet' or 'discours').

ways in which narratives have been used in design research. Then, it emphasizes the different functions of this concept in design and their relevant attributes and principles. In the last section, the implications of using narratives in design are discussed, as well as the merits of the relatively new practice of using narratives to structure user experiences over time, which has so far been underexplored.

DEFINITIONS OF NARRATIVE

An exploration of the use and function of narrative in design first requires a clear definition of the concept. Because narratives are both ubiquitous in life and extremely varied in nature – from an office anecdote to Homer's Iliad – it is difficult to converge on a single definition or set of characteristics that describes all types of narratives. The wide range of disciplines that have studied this subject, including narratology, linguistics, literary studies, film studies and philosophy, have defined narratives with a great number of different characteristics, some of which are more relevant for design - such as the occurrence of characters, causality, and elicitation of emotions, and others that are less relevant for design - such as the role of the narrator in a written text, which is not as obviously mapped against the way in which narratives are used in design. In general, definitions of narratives range from very broad to very specific. The most minimal definitions [1] cover almost any representation of events, whereas the most exclusive definitions [27] [2] [34] are limited to the kind of narrative one only finds in novels and movies.

	Representation of events	Chronological	Characters	Causality or agency	Values and emotions	Conflicts and climax
D1	•					
D2	•	•	•			
D3	•	•	•	•		
D4	•	•	•	•	•	
D5	•	•	•	•	•	•

Table 1 – Inclusion of narrative elements in definitions

Because different design practices make use of narratives on both sides of this spectrum we present five definitions of this concept (D1 to D5). These definitions were created to simplify a huge literature of narrative theory and the starting point was an analysis of a range of "minimum requirements" for something to be considered "a narrative" taken from definitions of "what a narrative is" by a series of narratologists from different schools, such as structuralist and cognitivist, as well as from different narrative disciplines, such as literary and film studies. Each of these definitions was then analysed in terms of what elements or requirements were included in the "minimum definition" and these elements were charted on a matrix. The elements were then grouped to come up with five simple definitions

aiming be accessible to designers but still grounded in narrative theory. Five definitions were found to provide enough detail for designers while still being accessible enough without overcomplicating. Each of these definitions is progressively more specific than the one preceding it. Put another way, each subsequent definition attributes an increasing amount of characteristics, thus narrowing the range of phenomena it considers to be a narrative. These characteristics are displayed in Table 1, and explained in the subsequent definition descriptions.

(D1) Minimal definition of a narrative: *Narrative is a representation of one or more events.*

An example from this minimal definition is the one-sentence narrative "It started to rain". It is a simple representation of an event, a "telling" of a story – a change in weather – rather than the event itself. This is the broadest possible definition of narrative: it includes nearly any account of any event, and it is used by theorists such as H.P. Abbott [1] when an inclusive definition is required, for example when analysing narratives which are not specifically a literary text (e.g. Löwgren [25]).

(D2) Definition of a sequenced narrative: *Narrative is a representation of one or more characters or entities in a series of chronological events.*

Example: "Mary was cycling home. She put her bicycle in the bike stand. She opened the door of her house and went inside." The character Mary undertakes a number of chronological activities. Such a narrative is for instance constructed when someone recalls a simple experience, or imagined by children in make-believe play. It can also be the format of a written record that keeps track of a succession of events in a strictly factual way, as anthropologists or a courtroom clerks may draw up. The D2 definition is similar to Chatman's [6], who states that the minimum definition of narrative requires characters (or entities, existents, inanimate characters) and a chain of events. This definition ties closely with a structuralist or semiotic approach to narrative, which tends to identify actants and sequences of events in time and their formal relationships (e.g Genette [16]).

(D3) Definition of a logically sequenced narrative: *Narrative is a representation of one or more characters in a series of chronological events that are connected by causality or agency.*

Example: "John was walking outside. It started to rain. John got wet, so he put up his umbrella." The reader interprets that John (a character) got wet (event) because it had started to rain (causality), which made him decide to put up his umbrella (agency). Simple narratives with causation are for instance used in product marketing: "This fruit drink is healthier than other brands, because it contains added vitamins." This narrative is more effective than the two separate statements without the causal link. Simple narratives with agency are for instance used in user insight stories: "Mary bought this car because she likes the way it looks and because she was previously disappointed with cars from other brands." The narrative gives insight into Mary's decisions and behaviour. Causal links between events are particularly important in Bordwell's definition of narrative in film [4] while agency is an essential element of fabula construction according to Bal [3]. This definition aligns closely with cognitive narratology, in which the focus is on the reader or viewer's understanding of the story (e.g. Bordwell [4] and Herman [21])

(D4) Definition of a value-laden narrative: *Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency.*

An example that fits this definition is the story of the ant and the grasshopper by Aesop [23], which can be summarized as follows: "The grasshopper laid back, enjoyed the summer and did not think of the future. The ant, on the other hand, worked hard to build a food supply for himself. In winter, the grasshopper died of starvation, while the ant survived." This story evokes emotions about the behaviour of the characters, and promotes a moral value: "diligence pays off in the long run". Such narratives can be used to influence user behaviour. For instance, narratives about product sustainability are set up to evoke certain emotions (shame about one's own behaviour, anxiety for the fate of the planet, compassion for the victims of pollution, etc.) and are meant to affirm good and bad-valued behaviour. In literature, Tan [36] is particularly interested in the way film narratives evoke emotions, while Herman [21] is concerned with the cognitive processed used by the viewer to interpret the narrative, including in terms of emotions. This definition aligns closely with a functionalist approach to narrative, which is concerned with the effects of narrative on the audience (e.g. Bruner [5])

(D5) Definition of an entertainment narrative: *Narrative is an emotion-evoking and value-laden representation of one or more characters in a series of chronological events that are connected by causality or agency, and which progress through conflicts toward a climax.*

Most narratives designed to entertain adhere to this definition. For instance, consider the fairy-tale "Little red riding hood" [32]. The story progresses through several conflicts (e.g. between the wolf and the girl, and between the wolf and the lumberjack) towards a negative outcome (grandmother and the girl are eaten by the wolf) but ultimately into a positive climax in which the lumberjack kills the wolf and saves the victims. The story evokes emotions like anxiety, fright, anger and relief through the different events. In addition, several values can be attached to the story, such as 'evil sometimes comes in disguise' (the wolf dressed in grandmother's clothes), and 'eventually good conquers over evil'. This definition is apparent in the structure of typical Hollywood films, which McKee describes at length [27], as well as in Aristotle's description

of the features of tragic plays [2] and Propp's classification of traditional fairytales [34].

These five definitions allow a comparative discussion on the different occurrences of narratives in design practice and on which 'definition level' these narratives exist. In addition, elements from each definition could be incorporated into the design process to create specific types of narratives.

TYPOLOGY OF NARRATIVE USE IN DESIGN

The following section presents an overview of narrative use in design, which places existing examples of design practice into three categories, each of which is divided into two subcategories. These categories show where in the design process and user-product interaction narratives occur, who is in control of the narrative, and which elements of narrative theory are useful for each category. Some narratives are suggested by design, others are completely delivered through design, and yet others support the design process.

Cluster 1:	Design facilitates a narrative
Category 1.1:	Design activates remembered or associated stories in the user
Category 1.2:	Design facilitates in-the-moment story imagining in the user
Cluster 2:	The narrative supports the design process
Category 2.1:	Narratives as tool to understand and empathize with users
Category 2.2:	The designer uses narrative elements in the design process as a tool to spark imagination and creativity
Cluster 3:	Design delivers a narrative
Category 3.1:	Design is accompanied by a narrative external to the object
Category 3.2:	Design structures the user experience over time as a narrative

Table 2 Clusters and categories of narrative use in design

This typology started from a bottom-up classification of a number of design examples that we considered to have significant narrative elements, as well as literature examples of narrative use in the design process and examples of designers explicitly using narrative principles in their designs. The most useful way to group this data seemed to focus on the audience of the narrative (the designer or the user), the timing of the narrative (when in the experience does the narrative emerge) and the agency of the object (whether the object helps to recall a narrative, is accompanied by a narrative or creates a narrative-like or easily narrativised experience).

Although the design examples often fit clearly into one category or the other, there is also overlap, as the categorizations are not mutually exclusive. Furthermore, all of the examples are related to product design (due to the authors' interest and expertise), but the categories could be expanded to include other fields of design.

Cluster 1: Design facilitates a narrative

In the following two categories, the user is both the creator and audience of the narrative

Category 1.1: Design activates remembered or associated stories in the user

In this category, the design does not come with a narrative that was specifically intended by the designer, but it triggers a personal memory or narrative association of a significant event, place, time or person. For example, people may keep certain inherited possessions of their grandmother, like knick-knacks or cookware, on the mantelpiece because it triggers stories and memories of childhood visits to grandma. The object is not specifically designed to contain and activate these memories, but it come to form part of a person's identity. Daniel Miller has written about material culture from an anthropological point of view, and how objects, in particular domestic objects, can come to take on personal meaning and stand in for certain aspects of a person's identity [28]. This category also includes objects that are specifically designed to activate a story of cultural meaning in the user, which are part of the cultural knowledge of the intended audience. For example, Alessi's Anna G corkscrew [Fig 1] can be interpreted to activate associations in the user by using the image of a saintly woman, while also activating different associations through the title reference to Sigmund Freud's famous patient Anna G. A user that is aware of both these cultural associations can create the story of the virtuous woman that seems paradoxically happy with a cork sliding up her skirt [26].

Figure 1 'Anna G' corkscrew by Alessi.

Category 1.2: design facilitates in-the-moment story imagining in the user

This category comprises the most open-ended use of narratives in design. The designer inspires the narrative but leaves space for personal interpretations through ambiguity. A classical example is a child playing with a stick. The child can use the stick to imagine herself in a story, in which the stick can be a horse, a sword, a fishing rod, or a

witch's broom, according to the story she wishes to envision [33]. The stick lends itself to this play because it is reminiscent of these other objects in shape, but ambiguous enough to leaves space for the imagination. But the category is not restricted to child's play. For example, Tony Dunne and Fiona Raby's Nipple Chair [Fig 2] is designed to trigger story creation in the user through intriguing but ambiguous output. The chair features two 'nipples' that seem to vibrate at random times. Because the user is unaware of exactly what electromagnetic event turns the vibration on and off, he or she is likely to attribute some sort of causal narrative to the chair's erratic behaviour.

Figure 2 - Nipple Chair by Tony Dunne and Fiona Raby

Cluster 2: The narrative supports the design process

In the following two categories, the designer is both the creator and audience of the narrative.

Category 2.1: Narratives as tool to understand and empathize with users

Figure 3 Bill Gaver, "Dream Recorder", Cultural Probes, 2004

Examples in this category have become ubiquitous in user-centred design, helped by methods from ethnographic research. User insights are bits of data that need to be captured, communicated and remembered within a design team, and narratives are one of the most natural structures for these purposes. A characteristic example is cultural probes [15], which have gained popularity among designers in the past decade and are widely used in different forms. Rather than recording data by having users answer specific

questions, cultural probes stimulate users to tell stories about themselves and their lives [35]. For example, the 'Dream recorder' [Fig 3] makes people talk and share intimate information and authentic thoughts that inspire designers.

Category 2.2: The Designer uses narrative elements in the design process as a tool to spark imagination and creativity

A clear example of this category is the way Studio Weave works on architectural commissions. Their project Freya and Robin [Fig 4], for example, starts as a story about two characters that lived on opposite sides of the lake for which the studio designed observation cabins. The story then becomes the guiding principle for the design of the cabins, and is used to motivate most of the design choices about the materials, forms and functions of the cabins. There are numerous examples of narrative elements being used during the design process as a creativity tool, such as Dindler and Iverson's Fictional Inquiry [9] and Nam and Kim's Design by Tangible Stories [29]. The authors argue that literary fiction can be used as a resource for design. Djajadiningrat and Gaver's Interaction Relabelling [10] shows how in a design assignment unrelated products (e.g., a toy revolver) can open up new space for creativity by bring a different story to the table.

Figure 4 Freya's Cabin looking over the freezing lake

Cluster 3: Design delivers a narrative

In the following two categories, the designer creates the narrative, while the user is the audience.

Category 3.1: Design is accompanied by a narrative external to the object

The narratives in this category are apparent in everyday branding of products and services. For instance, when a user buys a pair of Nike shoes, she is in fact also buying the narrative around it, which is communicated through advertising and word of mouth. Such narratives also exist for ideological ideas. For example, a user might be stimulated to buy organic milk because it includes a narrative of happy cows, health, and environmental benefits. Similarly, modernist design often featured a narrative, either explicitly or implicitly, about what was to be considered 'good design', and even how users could live better lives. Products from Droog design, like the aforementioned Tree Trunk-Bench, use external narratives more explicitly – every Droog product is accompanied by a

story. The recent project Significant Objects [17] aimed to measure the added value that an accompanying story adds to an object. Cheap objects were purchased at flea markets and writers were asked to write an accompanying story. The objects were then sold on eBay with the attached story to verify the increase in value. For example, a glass that was bought for $0.50 was subsequently sold for $50 [Fig 5] The buyers were not purchasing the story, freely available online, but simply the object which acquired meaning through the story.

Figure 5. Glass that increased in price 200-fold with an accompanying story

Category 3.2: Design structures the user experience over time as a narrative

This category features product and service experiences that have been explicitly structured to unfold as a narrative to the user. This is a variant of a design approach in which the designer envisions the interaction between the user and product over time, and carefully plans the sequence of events so that the user experiences the intended narrative. This design approach is for instance common for immersive theme parks, entertainment venues, and luxurious hotels. Furtermore, existing everyday objects can be described to (unintentionally) fit this category as well. For example, Löwgren [25] describes, within the context of aesthetics of interaction, how an experience with a cash machine (ATM) is articulated as a story in the user's mind through the build-up and release of tension. He describes how dramatic tension is built while the machine processes the PIN number, how other people in line behind the user can evoke fear of being robbed or anticipated shame for not having enough funds, and how the money and card finally being released from the machine brings relief. In a very simple way, the Anna G corkscrew [Fig 1] also fits this category, because the corkscrew is designed to first show the user the saintly figure that evokes certain associations, but later in the experience then the cork disappears underneath the woman's skirt from where the user needs to retrieve it. This contradiction evokes a time-based user experience that is structured as a narrative [13]. Products that evoke specific emotions over time also fall in this category. For example, the user of the On-edge Lamp (from Grimaldi's Ta-Da

series) [Fig 6] is meant to discover certain surprising findings in a particular sequence to increase the memorability of the object: the designer intended the lamp, which references the form and material of glass lamps, to sit on the edge of the table, so as to appear in a position of danger and activate a gut reaction in the viewer to want to move it onto the table. This has two effects – when the lamp is fully on the table it shuts itself off, revealing that it is meant to be on the edge, and also by touching the lamp the user realises that it is made of rubber, not glass, and is hence not as delicate as it appeared [20].

Figure 6. The On-Edge Lamp by Silvia Grimaldi

NARRATIVE FUNCTIONS IN DESIGN

The typology above shows in what ways narratives are used in design. It permits a certain classification about where and how narratives occur, who is the intended audience for the narrative, who is the creator of the narrative (the user or the designer) and whether this narrative is implicit in the interaction experience or is explicit, such as an accompanying narrative.

These are all characteristics that describe *how* narratives are employed in design. Another fundamental aspect related to this direction is the ultimate function or goal of narrative; *why* a narrative is included in design or the design process, and what the narrative ultimately *does* or *accomplishes* in its intended audience. The classification in Table 3 discusses seven different functions that narratives can serve, all of which are apparent when used in design or the design process. For each narrative function, an example related to the design process is discussed as well as an example related to the user-product experience.

Table 3 was created by assessing in a couple dozen examples of narrative use in design what their specific function(s) were, such as: 'the narrative helps the designer understand what these users would do in a situation like this', 'the narrative helps the designer to remember what the abilities of this user group are', 'the narrative in this ad gives the user a richer experience with the product', etc. These specific functions were subsequently grouped into the seven clusters of Table 3, according to their functional similarity.

It should be apparent that most narratives fulfil more than one function at a time – which is one of the reasons that they are so effective on different levels. Some of these functions, such as *memorability* and *teaching values*, have been used for millennia, for instance by myths, biblical tales and fairy tales. For example, the aforementioned tale of the ant and the grasshopper teaches a value (diligence), conveys this value tenably more effectively than a written rule (e.g., 'thou shalt be diligent'), is easy to remember, makes the user reflect on their own behaviour ('am I more like the grasshopper or the ant?') and is a delight to hear and tell, which is one of the reasons we still know it today – more than two millennia after it was conceived. Nevertheless, some narratives are not able to or do not aim to fulfil all these functions, so it is helpful to keep track of each function individually. This is apparent when analysing some of the examples from the typology of narrative use from the perspective of their narrative functions. For example, Dunne and Raby's Nipple Chair [Fig 2] stimulates people to think about the cultural implications of electromagnetic fields in the home [11], which highlights certain values and makes the user reflect on the issues, but does not convey information, or induce empathy or creativity. Similarly, the narratives implicit in Alessi's Anna G [Fig 1], or in Grimaldi's On-Edge Lamp [Fig 6] are meant to delight and to increase memorability, but do not aim to teach values or elicit empathy [20]. Narrative elements in the design process often aim to evoke creativity in the designer or in the team, such as with Gaver's ambiguity technique mentioned above [14]. But these goals might also be combined, for example in Studio Weave's Freya's Cabin [Fig 4], the narrative is used to foster creativity, but also as a way of conveying information about the project, because it helps to explain the design to the public and to the construction team, and also delighting and creating a memorable experience.

Obviously, a designed product may also be appealing, memorable, and so forth, for reasons other than the

Narrative function	Example of function in design process	Example of function in product use
NF1 Conveying information	Designers and researchers use narratives to communicate insights more clearly and effectively, for instance in persona stories, context stories, or stories about current product use. [24] [9]	Narratives can be used to communicate to users about how they can use their products, for instance in usage scenarios. [35]
NF2 Evoking reflectivity	User or product narratives that involve an unusual situation or some kind of conflict can be used by designers to highlight design problems or cultural issues. [40]	In critical design, narratives are used to make users reflect on the role of products and technology in their lives. [11]
NF3 Showing/ teaching values	Narratives can be used in the design process to show certain do's and don'ts of user-product interaction, for instance in horror stories of past products.	Narratives, such as those used by movements like cradle-to-cradle or modernism, can be used to convey the ideological purposes of the products they set forth.
NF4 Empathy & Identification	User or persona narratives are often used to achieve a greater empathy with real users than could be obtained with target group data [38] [8].	Personal narratives that a user attaches to an object, for instance its history, or who they received it from, can greatly increase the perceived value of the object.
NF5 Imagination & Creativity	Narratives can be used by designers to spark imagination and increase creativity [31] [15].	Product narratives can inspire users to new ways of using the products, or even new ways of fitting the products in their lives.
NF6 Memorability	User insights that take the form of a narrative are easier to remember than facts or bullet points.	Narratives attached to or created through a product increase the memorability of product experience, and increase word of mouth [35] [13].
NF7 Delighting	Narratives that not just inform but also delight, increase the chance to be used frequently and effectively by the design team.	Narratives, either as part of a product or external to it, can enrich the user experience [20].

Table 3 Different functions of narratives with examples of their use in the design process and in product use

narrative it involves, but such qualities are not part of the categorization of narrative function.

RELATIONSHIP BETWEEN THE DEFINITIONS, TYPOLOGY AND FUNCTIONS

The three categorizations in this paper, which show (a) what types of narratives occur in design, (b) where narratives manifest in design, and (c) why narratives are used in design, can also be cross-analysed to better understand which kinds of narratives occur where, and which function they fulfil in each case.

Reflecting on the use of narratives in the design process, from the perspective of the five different definitions D1-D5, it seems that D3, *Logically Sequenced Narrative*, is used most explicitly: simple narratives that feature real users or personas (characters) and actions (agency), as well as events and their causes (causality). D2 *Sequenced Narratives* might be used for more neutral accounts of events, for instance in reports of usability tests that state the sequence of events a certain user went through. D4 *Value Laden Narratives* are often used in the design process, for instance when an anecdote is included of how a similar product might have horribly failed in the past. However, such accounts seem to be used less frequently than D3 narratives, perhaps because it is unfeasible or undesirable to include values and emotions in each product or user insight story. D5 *Entertainment Narratives* are usually left to professional writers, and are thus, to our knowledge, nearly never included in a design process. D1 *Minimal Narratives* are so broadly defined that it is probably of little use to designers or design researchers to consider them.

In user-product interaction, the kinds of narratives that are put into a product or that accompany a product are mostly in the D3-D4 range, as is apparent from aforementioned examples like the marketing narratives or the modernist narrative. D5 narratives are certainly used in intricate marketing campaigns for products; however this genre has not seen much application in product experience itself, apart from obvious examples like video games and other entertainment products with an elaborate narrative.

By comparing the different points of view of narrative definitions, typologies of use, and goals and functions of narrative, we aim to provide some insight into what elements designers can use at different stages of the design process to create different effects. For example, narratives in Category 3.2 (*Design structures the user experience over time as a narrative*) can be enriched by the elements of a *logically sequenced narrative* (D3): the designer could incorporate (perceived) causal links between the events that make up the product experience. These are of particular interest when a designer wants the product to have an understandable or logical narrative for increased usability (NF1); these may be particularly relevant to Categories 1.2 (*design facilitates in-the-moment story imagining in the user*) and 3.1 (*design is accompanied by a narrative external to the object*). Furthermore, these links might be

relevant when the designer wants to *evoke reflectivity* (NF2), because the user will be prompted to reflect on the connections between the different events, and to come to conclusions as to why the designer made particular choices, thus encouraging a form of dialogue with the artefact or with the designer through the artefact.

Value-laden narratives (D4) can be analysed in terms of how the narrative contributes to delivering a message (NF3); this can be linked to several of the categories from the typology. For example, in designs that are experienced with an accompanying narrative (Category 3.1), a value-laden overarching narrative sometimes frames the product; by communicating a value common to all organic products, for instance, the organic milk product is framed in this accompanying narrative.

Entertainment narratives (D5) tend to be more complex and specific to the medium, but they can still lend clues to aid in the design process. For example, conflict and climax are important elements in the construction of film and theatre narratives, and these could be incorporated into the design process or in the designed artefact. Some examples of this type of application can be seen in the type of installations and design interventions detailed in Löwgren [25] in which he analyses experiences with designed environments and objects in terms of rhythm and dramaturgical structure. Elements such as agency of objects, conflict, climax, and causal links can be incorporated into the design of the experience to create a rich narrative which may *facilitate story imagining in the user* (Category 1.2) in order to *delight the user* (NF7) or to stimulate more imaginative product uses (NF5). An example of such a project in progress is Grimaldi's Cinematic Narratives project [19].

DISCUSSION

The goal of this paper is to lay groundwork for a considered approach of the use of narrative in design; although narratives are already used in many areas of design for different purposes, there are no approaches or frameworks to describe these uses, which makes it difficult for designers to communicate about the topic or to engage with those elements of narrative theory that might enrich their design process or design work. In this paper we created a common frame of knowledge around narrative use in design, by considering *what* narratives are in definitions from narrative theory, by analysing *how* narratives are used in the design process and designed artefacts, and by looking at *why* designers might want to use narrative in their work. This framework aims to be a starting point in developing a methodology of narrative use in design which could be used by designers as a generative tool, and by researchers as an analytical tool in understanding and categorizing design work.

Sometimes, when the idea of narrative is used in design it is used to assess whether something *is* or *is not* a narrative; however from our analysis of definitions of narrative this becomes less relevant. If minimum narrative is broadly

defined as a sequence of events told or interpreted by someone, any experience could be described or analysed as a narrative. However, it is more interesting for designers to use the framework to analyse which narrative elements are present in their design and which could be added or subtracted to the narrative implicit or explicit in the design to make it a more engaging, meaningful, memorable, rich narrative.

Each section of this paper takes a different perspective. The definitions section can suggest narrative elements to be considered in the design process. The typology can prompt designers to

a. analyse and consider how narrative elements might be applied and when, focusing on the time-based aspects of the user's interaction
b. where the narrative is located, whether within the object, through the object's agency, or externally to the object as an accompanying narrative or in the user's experience in terms of the way the user interprets the experience or in the designer's experience of the design process.
c. The functions can prompt designers to reflect on what effects this particular narrative may have on the user or the design process.

This process of analysis and addition and subtraction could be used within all stages of the design process, from analysing the narrative in scenarios of product use, for example, to using it as a tool to generate ideas to refining a concept in a development phase.

FUTURE WORK

There are several areas that arise from this study as possible developments for this approach to design. The authors are interested in the idea of applying elements from the area of entertainment narratives (D5), for instance by introducing conflict and resolution or a climax to events, to structure the user's experience of an artefact, as well as the idea of using narrative theory as a guide to developing explicit narratives such as product characters. Some of the projects that lead on from this study are:

a. Investigating through design practice how the introduction of elements from film can enrich the user's narrative interpretation of a product, thus increasing the gusto in retelling and remembering the product interaction experience [18].
b. Studying how narrative structures like suspense and conflict can enrich the user's emotional experience with products and services. [12]
c. Analysing how subjective stories foster long-lasting relations and connectedness between a person and a design object from anticipation to appropriation. [30]
d. Investigating whether narrative elements always add to a design or whether they also subtract to the user experience; in other words, how much narrative is too much?
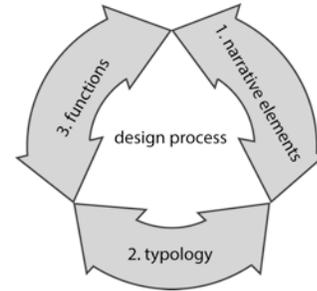
Figure 7: Three Step Narrative Design Process

The next step for this study will be to refine and develop the three step process outlined in this paper [Fig 7], looking at narrative elements, typology of narrative use, and functions of narrative in the design, into a toolbox that would be tested at workshops with design students as well as with design professionals. We are also interested in starting a discussion in the design community about the use of narratives within their design practice, research or teaching, and to this end we aim to assemble a database of design examples which could illustrate and expand the ideas about definitions, types and functions of narrative elements. To this end, we invite submissions of projects to this database.

REFERENCES

1. Abbott, H.P., 2008. *The Cambridge Introduction to Narrative*, Cambridge University Press.

2. Aristotle. 1987 *The Poetics of Aristotle*: Translation and Commentary. London: Duckworth.

3. Bal, M., 1997. *Narratology: Introduction to the Theory of Narrative*, 2nd ed. ed. University of Toronto Press, Toronto.

4. Bordwell, D., 1985. *Narration in the Fiction Film*. Univ of Wisconsin Press.

5. Bruner, J., 1991. *The narrative construction of reality*. Critical inquiry 18, 1–21.

6. Chatman, S.B., 1978. *Story and Discourse: Narrative Structure in Fiction and Film*. Cornell University Press, Ithaca; London.

7. Crossley, M.L., 2002. Introducing Narrative Psychology. In *Narrative, Memory and Life Transitions*. University of Huddersfield, pp. 1–13.

8. Danko, S., 2006. Humanizing design through narrative inquiry. *Journal of Interior Design* 31, 10–28.

9. Dindler, C., and Iversen, O. S., 2007. Fictional Inquiry—design collaboration in a shared narrative space, *CoDesign*, vol. 3, no. 4, pp. 213–234.

10. Djajadiningrat, J.P., Gaver, W.W., Frens, J.W., 2000. Interaction Relabelling and Extreme Characters: Methods for Exploring Aesthetic Interactions, *DIS '00 Proceedings of the 3rd conference on Designing*

interactive systems: processes, practices, methods, and techniques pp. 66–71, 2000.

11. Dunne, A., 2008. *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*. The MIT Press.

12. Fokkinga, S.F. and Desmet, P.M.A, 2012. Darker shades of joy: The role of negative emotion in rich product experiences. *Design Issues*. MIT Press. 28(4): 42-56

13. Forlizzi J., and Ford, S., 2000. The Building Blocks of Experience: An Early Framework for Interaction Designers, *DIS '00 Proceedings*, pp. 419 – 423

14. Gaver, W. W., Beaver, J. and Benford, S., Ambiguity as a resource for design, *Proceedings of the conference on Human factors in computing systems - CHI '03*, no. 5, p. 233, 2003.

15. Gaver, W., Boucher, A., Pennington, S. and Walker, B., 2004. Cultural Probes and the Value of Uncertainty, *Interactions,* vol. XI, pp. 53–56.

16. Genette, G., 1980. *Narrative discourse*. Cornell University Press.

17. Glenn, J., Walker, R. (Eds.), 2012. *Significant Objects*, Original. ed. Fantagraphics.

18. Grimaldi, S. (2013). Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions. In E. Brandt, P. Ehn, T. D. Johansson, M. Hellström Reimer, T. Markussen, & Anna Vallgårda (Eds.), *Nordes 2013: Experiments in design research Online proceedings* 9-12 June 2013 Copenhagen-Malmö.: www.nordes.org.

19. Grimaldi, S. 2012. Cinematic Narratives of Product Interaction Experiences, *Proceedings of 8th International Design and Emotion Conference* London 2012 Central Saint Martins College of Arts & Design, Edited by J. Brassett, P. Hekkert, G. Ludden, M. Malpass & J. McDonnell.

20. Grimaldi, S., 2008. The Ta-Da Series – A Technique for Generating Surprising Designs Based on Opposites and Gut Reactions, in: Desmet, P.M.A., Karlsson, J. van E. (Eds.), *Design and Emotion Moves*. Cambridge Scholars Publishing.

21. Herman, D., 2004. *Story Logic: Problems and Possibilities of Narrative*. Univ of Nebraska Pr.

22. Kearney, R., 2002. *On stories*. Routledge, London; New York.

23. Kurtzman. H., 2001. *The Grasshopper and the Ant*. Amherst, Mass.: Denis Kitchen Publishing.

24. Lloyd, P., 2000. Storytelling and the development of discourse in the engineering design process, *Design Studies*, Volume 21, Issue 4, pp. 357–373

25. Löwgren, J., 2009. Toward an articulation of interaction aesthetics. New Review of Hypermedia and Multimedia 15, 129–146.

26. Markussen, T., Özcan, E., Cila, N., 2012. Beyond metaphor in product use and interaction, *DeSForM 2012*

27. McKee, R., 1999. *Story: Substance, Structure, Style and the Principles of Screenwriting*. Methuen Publishing Ltd.

28. Miller, D. *Home Possession: Material culture behind closed doors*, Oxford: Berg, 2001

29. Nam, T., & Kim, C., 2011. Design by Tangible Stories: Enriching Interactive Everyday Products with Ludic Value. *International Journal of Design*, 2011 Apr 30.

30. Ocnarescu, I., 2012. An initial framework of aesthetic experience over time, Proceedings of *8th International Design and Emotion Conference* London 2012 Central Saint Martins College of Arts & Design, Edited by J. Brassett, P. Hekkert, G. Ludden, M. Malpass & J. McDonnell.

31. Parrish, P., 2006. Design as storytelling. *TechTrends* 50, 72–82.

32. Perrault, C., 1999. Little Red Riding Hood. *Perrault's Complete Fairy Tales*. Trans. A. E. Johnson. New York: Puffin Books, 66-69.

33. Portis, A. , 2007. *Not a Stick*, Ed. HarperCollins.

34. Propp, V. I. 1968. *Morphology of the Folktale*. University of Texas Press.

35. Steffen, D., 2009. Meaning and narration in product design, *DPPI '09 Proceedings*, pp. 1–9.

36. Tan, E. S., 1995.*Emotion and the Structure of Narrative Film: Film As An Emotion Machine*. Routledge.

37. Wright, P., McCarthy, J., 2010. *Experience-centered design: designers, users, and communities in dialogue*. Morgan & Claypool Publishers, San Rafael, Calif..

38. Wright, P., McCarthy, J., 2008. Empathy and experience in HCI, in: *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08*. ACM, New York, NY, USA, pp. 637–646.

39. Young, K., Saver, J. F., 2001. The Neurology of Narrative, *SubStance*, Vol. 30, No. 1/2, Issue 94/95: Special Issue: On the Origin of Fictions: Interdisciplinary Perspectives, pp. 72-84.

40. Ypma, B. E., and Wiedmer, M., 2010. Fiction in Design Research, Report on the *6th Swiss Design Network Conference* in Basle

Appendix 4: Matrix of Minimum Narrative Definitions

AN ATTEMPT AT A MATRIX OF "MINIMAL" DEFINITIONS OF NARRATIVE:
Approximately going from a more minimal definition to a more detailed one requiring more parameters.

REF:	Definition	Events (min number)	Representation of	Character and/or entity	Agency	Structured Progression	Hero	Conflict	Affect	Logical connection	Time	Space	Other
Abbott (literary)	"Narrative is the representation of an event or a series of events" [Abbott, H.P., 2008. The Cambridge introduction to narrative. Cambridge University Press. p.13]	X (1)	X										
Todorov (structuralist, linguist) coined term narratology (1960s)	A three part sequence of events for narrative progression: "initial equilibrium - destabilization - new equilibrium" [Todorov, T., 1977. The Grammar of Narrative. T.T. The Poetics of Prose. Ithaca: Cornell UP, 108-19- cited in Hühn, Peter: "Event and Eventfulness". In: Hühn, Peter et al. (eds.): the living handbook of narratology. Hamburg: Hamburg University Press. URL = hup.sub.uni-hamburg.de/lhn/index.php?title=Event and Eventfulness&oldid=1446 [view date: 11 Dec 2012]]	X (3)				X				X equilibrium			
Prince (narratology, structuralist)	"A minimal story consists of three conjoined events: The first and third events are stative, the second active. Furthermore the third event is the inverse of the first." [Prince, G., 1973. A grammar of stories: an introduction. Mouton.]	X (3)				X				X Conjoined; 3rd is inverse of 1st			
Chatman (post-structuralist, narratologist)	"What are the necessary components - and only those - of a narrative? Structuralist theory argues that each narrative has two parts: a story (histoire) the content or chain of events (actions, happenings), plus what might be called the existents (characters, items of settting); and a discourse (discours), that is the expression, the means by which the content is communicated." [Chatman, S.B., 1978. Story and Discourse: Narrative Structure in Fiction and Film. Cornell University Press, Ithaca ; London.]	X	X	X								X	
Aristotle (classical philosophy)	The definition is problematic because it has been reinterpreted so many times and specifically refers to tragedy in a classical sense – this may be one for the discussion but not the matrix.	X				X	X	X	X				
Bordwell (film, cognitivist)	"In the fiction film, narration is the process whereby the film's syuzhet and style interact in the course of cueing and channeling the spectator's construction of fabula." (P53) "More specifically the fabula embodies the action as a chronological, cause-and-effect chain of events occurring within a given duration and a spatial field." (p49) [Bordwell, D., 1985. Narration in the Fiction Film. Univ of Wisconsin Press.]	X	X							X cause and effect	X	X	style
Bal (narratology, literary, post-structuralist)	"A story is a fabula that is presented in a certain manner.[...] A fabula is a series of logically and chronologically related events that are caused or experienced by actors [agents]" [Bal, M., 1997. Narratology: Introduction to the Theory of Narrative, 2nd ed. ed. University of Toronto Press, Toronto.]	X	X	X	X				X	X logical and chronological connection between events			
McKee (film, structuralist)	"narrative is a series of acts that build to a last act climax or story climax which brings about absolute and irreversible change; a story with its plot, its self-sufficiency, its own individual quality, its movement, its end (close as climax), its unrepeated quality. [McKee, R., 1999. Story: Substance, Structure, Style and the Principles of Screenwriting. Methuen Publishing Ltd.]	X				X	X	X		X Absolute, irreversible change; climax, self-sufficiency, individual quality, movement, unrepeated			
Routledge (Ryan)	"Story, like narrative discourse, is a representation, but unlike discourse it is not a representation encoded in material signs. Story is a mental image, a cognitive construct that concerns certain types of entities and relations between these entities.[...] Narrative may be a combination of story and discourse, but it is its ability to evoke stories in the mind that distinguishes narrative discourse from other text-types. Here is a tentative definition of the cognitive construct that narratologists call 'story': 1. The mental representation of story involves the construction of the mental image of a world populated with individual agents (characters) and objects. (Spatial dimension.) 2. This world must undergo not fully predictable changes of state that are caused by non-habitual physical events: either accidents ('happenings') or deliberate actions by intelligent agents. (Temporal Dimension) 3. In addition to being linked to physical states by causal relations, the physical events must be associated with mental states and events (goals, plans, emotions). This network of connections gives events coherence, motivation, closure, and intelligibility and turns them into a plot. (Logical, mental and formal dimension [...])." [Herman, D., Jahn, M., Ryan, M.-L. (Eds.), 2005. Routledge Encyclopedia of Narrative Theory, 1st ed. Routledge.]	X	X			X				X logical and formal dimension (causal relations, mental states, coherence, motivation, closure, intelligibility) not fully predictable changes	X	X	

Appendix 5: Grimaldi, S. (2012) 'Cinematic Narratives of Product Interaction Experiences: Methods for Cross-Media Fertilisation of the Design Process', in Brassett, J. et al. (eds) Out of Control: Proceedings of 8th International Design and Emotion Conference London 2012. London: University of the Arts London. Available at: http://www.designandemotion.org/ (Accessed: 17 October 2017).

CINEMATIC NARRATIVES OF PRODUCT INTERACTION EXPERIENCES.
METHODS FOR CROSS-MEDIA FERTILISATION OF THE DESIGN PROCESS

Silvia Grimaldi
University of the Arts London
s.grimaldi1@arts.ac.uk

ABSTRACT

This paper outlines the initial phases of a practice-based PhD research project; the paper will outline methods that will be used to analyse the role of objects within cinematic narratives and how these narrative roles could be translated into methods for designing products to enrich the experience of using the products. The starting point for this project is the hypothesis that any interaction between a user and an object will be remembered and interpreted in a user's mind as a form of narrative. This project will therefore try to harness narrative structures and devices from other media to inform the design of products that can specifically cater to these narrative qualities inherent in the way we experience products. This paper outlines methods for opening up the dialogue about these cross-media narrative comparisons, to assist in generating design work which focuses on the narrative qualities of product experience.

Keywords: narrative, product, interaction, experience, film.

INTRODUCTION

This paper will outline the methods that will be used during the first phases of research for a practice-based PhD about the role of narrative in product interactions. This follows an interest that developed through previous research/design work and writing. I became interested in the role of narrative in the creation of emotions, and in particular of product emotions, following a project about the use of surprise in product design. I had embarked on this project expecting to create a series of surprising objects, and I did this by analysing what surprise is from a psychological point of view, how you can create surprise within a given context and how you can then best apply this concept of surprise to the user's experience of the product. What I was not expecting when embarking on this project was that the process of design and reflection would change the way I looked at objects in several key ways. The first shift was in the design focus; I started looking at how to design the experience of a product as opposed to designing the product itself; this relied heavily on the work of Donald Norman (Norman 2003) as well as Pieter Desmet (Desmet 2002) . Looking at the product through the lens of product experience meant that I was able to not only design the physicality of the object but to focus on designing the interaction between the user and the object. In doing this, my theoretical focus also shifted from using surprise as an emotion embedded in the product to using surprise as the emotional climax of a longer narrative user journey.

This realisation came after writing about the project from the point of view of design methods in my thesis, a conference paper (Grimaldi 2006) and eventually a chapter in the book Design and Emotion Moves (Grimaldi 2008). The conclusion of this work led me to the hypothesis that increased narrativity of the product experience would increase the emotional engagement with the product and the future recall of the product through memory or word of mouth. This is based on our natural propensity to interpret experiences through a narrative lens, and when remembering or retelling experiences we will further consolidate this narrative

OUT o CONTROL

Proceedings of 8th International Design and Emotion Conference London 2012
Central Saint Martins College of Art & Design, 11-14 September 2012
Edited by J. Brassett, J. McDonnell & M. Malpass

42

structure (Abbott 2008). Because of this it is important for anyone designing an experience, such as a product experience, to have a strong grasp on those narrative structures that govern the way we interpret events (Abbott 2008). Most people will have a set of expectations about the narrative of their everyday life that may be derived from their own experience, but these expectations are also shaped by the narratives that they come into contact with in a fictional realm. There is therefore a huge opportunity for designers to look at research into the field of narrative to inform the way they design a product.

The focus of the PhD is on creating products that communicate a narrative to the user on their first interaction with the product and on making the design methods used transparent for other designers to adopt and adapt as suited. To narrow the field down the work will be concentrating on domestic products because they tend to embed values about the user (Miller 2008) and because they tend to have a highly emotional charge (Miller 2001). In addition the research will look at a sample of narratives from films that are set in a domestic environment and that feature objects in prominent roles, for example as a hingepoint, an actor, a character, etc. and will be finding narrative devices from these films which could be applied to the product experience. I decided to concentrate on the feature film because it is a narrative medium that most people can relate to, it is a finite experience in time (as opposed to reading a novel which may last months) and it often features everyday objects within regular contexts.

From the point of view of design research this project is about the area that Nigel Cross calls design praxiology [SIC] (Cross 2007): research about how designers design, what the design process is and the ways and methods used to create design work. In particular the focus is on the idea generation stage of the design process because this is the stage that is often overlooked or attributed to the designer's instinct or "talent" while a lot of designers and design students tend to or are sometimes forced to approach this in very systematic ways (Design Council 2007). The idea that creativity is not purely innate but can be analysed, described and learned through specific tools is not new and is described at length in psychology literature

(Ward & Finke 1995; Weisberg 1993). Interestingly, when looking at other creative mediums, in particular narrative mediums such as fiction writing or scriptwriting, the creative process is often analysed in detail and treated as a skill which can be learned (McKee 1999). From the point of view of a designer I am interested in methods for generating ideas, especially in those situations in which I don't have a clear path ahead of me in terms of what to design or how to respond to a particular brief or idea. While it is true that a lot of designers will instinctively come up with great ideas, it is also true that a lot of designers have particular structures or methods they use, from brainstorming and roleplaying to research and visualisation (Design Council 2007). From the point of view of a design educator, I am interested in idea generation methods that students can use to expand their repertoire of ideas and think outside of their immediate ideas to more interesting or more complex concepts.

WHY LOOK AT NARRATIVE?

Why look at narrative to inform product experience? Narrative is often used in other areas of design such as branding, advertising and service design for its ability to trigger emotions; yet this idea of creating a story around the user's experience of a design is applied in a different way from the model proposed in this paper. When a story is used in branding it tends to be extrinsic to the product experience: you need to be familiar with the brand beforehand in order to recognise the hints to the larger story within the object, through logos or details of the object's physical construction or functionality. These hints may also be present within the product experience, but the user is normally expected to have prior knowledge of the brand in order to understand the story. In service design a story is often used as a design method: the user experience of a service is represented in terms of a story, but this story is not necessarily embedded or evident in the products themselves (Stickdorn & Schneider 2010).

In the model proposed through this project the story of the interaction should ideally be self-contained: it can reference a cultural context, and this can create a backstory for the user, but the story in terms of sequence of events should be intrinsic in the

interaction with the object itself. This is because the aim is to come up with design methods that could apply to design on a small scale, outside of major commercial brands, to the work of speculative or research designers and designer/makers who cannot benefit from brand recognition, advertising and similar brand-based narratives. Although often it is hard to make the distinction between the qualities that are inherent in the object itself and those that are inherent in the brand, the aim of this project is to look at how narrative can be used outside of the brand narratives that surround objects and to focus on those qualities that are present in the objects themselves.

Narrative is often considered the tool that humans use to understand time (Abbott 2008) and it is intrinsic in our understanding of our own identity and selves (Michele L Crossley 2002). Literature on narrative deals specifically with timing in the form of narrative structure; in particular, narrative theory distinguishes between the story, and the way the story is told. The terminology used for these two elements sometimes varies, but Abbott (Abbott 2008) defines the two aspects as story (which refers to the events or sequence of events) and narrative discourse (which refers to how the story is told). For example, the story of Romeo and Juliet as a sequence of events would be referred to as a story while the way Shakespeare tells of these events in his play constitutes the narrative discourse. Chatman goes further and describes narrative structure as being intrinsic in our understanding of the world; our mind seeks the impression of cause and effect that is given by narrative discourse (Chatman 1978).
Narrative discourse frames the actions of a story in order for them to make sense to the audience or even to the teller.

Film is particularly concerned with causing an emotion in the viewer; as viewers we invest ninety minutes of our time in the cinema to be engrossed into a story, to identify with the characters and to feel their emotions. When a film does not make us feel emotionally invested, we don't think it's a good film. (McKee 1999). This ability to cause emotions because of the presentation of a series of events in a particular medium, but also in a particular narrative discourse, is something that could be applied to products if you

look at the interaction with a product as a time-based experience. Donald Norman refers to time-based interactions with products and how these can influence future take-up through "rosy retrospection" (Norman 2009). Desmet and Hekkert describe the product experience as being temporal and dependent on the user's disposition (Peter Desmet & Hekkert 2007) and both these qualities could be informed by the analysis of other mediums that are more specifically time-based and that use the idea of timing to shape the viewer's emotions.

Emotional reactions to products only make sense within a wider context which includes pre-existing knowledge, be that cultural knowledge: knowledge about archetypes or affordances, about materials, conventions, etc. or personal knowledge: knowledge derived from a person's previous experience. How and when within the product experience this knowledge is referenced or hinted at will shape the narrative discourse of that experience in terms of memory but also in terms of recounting the interaction to someone else, something which is crucial when we think of the role of word of mouth or product reviews within the marketing of a product.

The aim of this phase of the project is to create a framework, in the form of a matrix, for comparing a product experience to a cinematic viewing experience, in order to tease out which narrative structures and devices could be of use to product designers during the process of designing for the product interaction experience. This would allow designers to view the product interaction experience as a narrative and to take advantage of the literature on narrative within the context of film in order to inform the design of objects. In addition, within an emotional design context, narrative can be analysed from the point of view of the creation of emotions in a cinematic audience, and then this analysis could be applied to the creation of emotions within a product interaction experience.

The next chapter will describe the methods that will be used to compare film narratives with product experience narratives with the aim to create a tool that will be used in a further phase of the project to generate and test design work.

METHODS FOR ANALYSIS

This chapter will outline the methods that will be used throughout the initial phase of PhD research; the aim of this phase is to create a framework for cross-media comparisons which can enrich design practice though adopting narrative theory from other media. Initially the films will be analysed from the point of view of objects and narrative structures. This analysis will be summarised in a matrix of objects and narrative types, which will then inform the analysis of user-object interactions. The user-object interactions will be looked at through a series of tests and experiments with participants and then the matrix will be revised based on the reflection on this comparison. The aim of this phase is to prepare a matrix which can be applied to the design process.

The first step in the participant research will be a short online questionnaire, aimed at getting about one hundred responses. This is designed with a double aim: to select a number of objects which may best lend themselves to this study and to select a number of participants who may be willing or predisposed towards talking about their interactions with objects. The questionnaire will have two open questions, asking the user for a list of the five domestic objects that first come to mind and then asking for a list of three objects that they most enjoy using, followed by space in which to write why they find each interaction enjoyable. The question about enjoyment with objects is mainly aimed at eliciting a descriptive response in the following motivation section and its primary aim is to select participants that would be willing to engage with the study in a narrative way. Finally the participants will be asked whether they would be willing to participate in further research for this project. The objects that will be mentioned in the two categories will be selected for further investigation, and the participants who have engaged the most with the "why" aspects of the second question will be asked to participate in further studies.

Because of the nature of the project, as a practice-based research project that aims to create methods to generate design work, it is more important to find participants that would be willing to talk at length about their experiences with objects as opposed to finding a sample that reflects the general population or a particular demographic group. The aim of the participant research is to obtain six in-depth qualitative interviews in the form of a story as opposed to studying reactions that can be generalised to a particular population. This follows the example of Dunne and Raby's participant selection methods in Hertzian Tales, in which they describe a similar approach to selecting participants (Dunne 2008). Because of this the questionnaire will be posted on internet boards that are followed by people with an interest in objects, but not necessarily experts, designers or design students, such as the Freecycle network, DIY and Car Boot Sale online message boards.

Following the questionnaire there will be a process of matching and selection of films based on several criteria: the films should be set in a domestic setting, so as to mirror the setting for the objects that will then be designed; the films should be relatively contemporary, from the 1990's onward, so as to be set in a time period that reflects our own in terms of objects featured and in terms of resonance of narrative style and storylines with a contemporary audience. The final criteria is that the objects identified in the questionnaire should feature in a prominent role in the films. The role of the object could be as a hingepoint, an event that triggers a change in the direction of the story, for example the alarm clock in Groundhog Day (Ramis 1993); as a character, for example the tape recorder in Twin Peaks, which Dale Cooper talks to and calls Diane (Anon 1990); as an agent, something that affects the storyline, for example the draughtsman's drawings in The Draughtman's Contract (Greenaway 1983); or even as a macguffin, a real or imagined object that fulfils a desire or aim in the narrative, for example the case in Pulp Fiction (Tarantino 1994).

Several films will be selected for each object through searching metadata databases, which contain script and subtitle information which mention objects with prominent roles, and by consulting with a group of film experts including a film archivist and several film professors. These films will then be analysed in terms of the studied objects, paying attention that there is a variety of genres represented for each object so as to allow for a variety of narrative devices and structures.

For example, the role of the LP record in Little Voice (Herman 1998) is as a character, which stands in for LV's father, with all the emotional qualities associated to an idealised father figure. In High Fidelity (Frears 2000) the LPs play a role of documentation of an emotional history as well as physical trace of an emotional burden; they stand in for the protagonist's back story or baggage. In Shaun of the Dead (Wright 2004) the LP takes on the role of comedic weapon; the casual choice of the LP as a record is the hingepoint to a cathartic moment in which the protagonists shed their embarrassing past and the protagonists turn from passive to active in fighting the zombies.

The analysis of the films will concentrate on the role of the object within the narrative structure of the film story and on the interaction between the characters and the objects in the film. Keeping in mind that objects are never casually placed in a film and they always carry meaning, from a semantic and from an emotional point of view, the analysis will focus on three different aspects: the meaning of the object within the story; the physical interaction between the character and the object and the narrative role of the object within the scene and within the film. This will then form the basis of a matrix which will visually compare the object and film characteristics and outline broad narrative roles for the objects. Discussion forums on the Internet Movie Database will then be used to verify the whether the narrative roles assigned to the objects can be verified by a broader group of people interested in film.

The matrix will be constructed based on a narrative theory framework, so that object interactions as represented in the films can easily slot into categories of meaning, physical interaction and narrative role. Filling the matrix up in this way will help to identify areas of overlap or commonality between different objects and different films and flag up areas that are not touched or under-represented. Because the overall project is interested in gathering qualitative research to inform a practice-based project the aim of the research is not to create a comprehensive review of every film in a given category, but to create a structure that could be added to or subtracted from and that would aid in the creation of design methods.

The objects will then be tested in participant experiments to create a comparison with the object interactions in the film, seen from a narrative point of view, and participant object interactions, also seen from a narrative point of view. The project is interested in the experience of interacting with an object, but also in how the user interprets that experience in the form of a story through memory and through recounting the story. Because of this the participant research will be based around oral history methods to allow for the user's unique story of the interaction to show through. This will be contrasted with a more objective outsider's view of the object interaction.

The experiments will be set out in the following way: each participant will be asked to test the full range of objects in their own domestic environment and the participant will be filmed interacting with the objects in a non-obtrusive way. The participants will then be interviewed and asked to describe their interaction with the objects. The interview will be audio-recorded. Ideally it will then be possible to contrast the filmed interaction with the recounting of the interaction and to identify narrative strands in both sets of data. The narrative strands would then be analysed in the same way as the films and the information would be added to the matrix.

The aim is that this matrix will then provide a platform for discussing object interactions as cinematic narratives and this will conclude the first phase of the research, which this paper is concerned with. The following research phase will be the most practice-based and the matrix will then be used as a tool for generating design concepts, which will be selected, developed and tested in a similar way to the everyday objects. The final phase will be concerned with reflection on the process and revising the matrix into a series of design methods which could be apparent and usable by other designers or design students. This method will provide a platform for cross fertilisation between narrative theory and practice and design praxiology and it will hopefully enrich the discourse about how other media and theory can directly influence the design process.

FUTURE DEVELOPMENTS

This paper has outlined the role of narrative in the construction of personal identities and memory, it has then described methods that will be used in future stages of the research to cross-fertilise the design process with elements from film narratives.

The aim and hope of this phase of the project is that the analytical method described above will open up debate on the role of narrative in product experience and will make designers more aware of designing for this narrative experience. The following phase of the project will be practice-based and will give the designer a chance to apply this framework to the design process and then reflect upon this and create guidelines or design methods that could be adopted by other designers. The matrix described in the Methods for Analysis chapter will be used to create design work in response to the roles that the studied objects take in a varied sample of films. This work will then be tested with the same participants and the same methods that were used to test the everyday objects: the participants will be asked to interact with the designed object while on camera, and then they will be interviewed in an audio-recorded interview about their product interaction experience. The video of the interaction and the audio interview will be analysed in narrative terms according to the same elements of narrative theory that were used to analyse the films, looking at the way the story is told, its structure and the narrative role that the object played in the story.

The aim of this further testing is to determine whether the narrative methods used to design the experience have influenced the way the participants interpret the experience from a narrative point of view, whether this has facilitated or created particular emotions or feelings in the user and whether the embedded narrative is apparent in the user's experience. Based on this the design methods will be analysed and if necessary the design and testing process will be reiterated. The conclusion of the project would be a book and an exhibition outlining both the designs and the methods used to generate the designs, in an attempt to make the design process more transparent for other designers or for design students.

There are several issues with this research that need to be pointed out and that will probably not be resolved until after the research has been carried out. One of the main questions is whether the single interaction with an object can be comparable to a cinematic viewing experience in terms of depth of involvement, from the point of view of emotional involvement and of physical involvement: in the cinema we are isolated from all other stimuli by having dim lights, a large projected image, surround sound, etc. When we interact with a physical object however we may be daydreaming or thinking about something else, chatting to someone or just generally not paying attention. This may reveal itself to be a problem, but it also may not be as relevant because we can take into account the fact that the depth of involvement in the two media will be different, and we can then design for a product interaction experience that may be overseen by a distracted user but that may be picked up by someone who may be in the right frame of mind. In addition, film-based interactions between character and prop may not reveal themselves to be similar to real-world interactions between user and object, simply because the actor is working to a script and filming over a number of takes.

The next open question is about context. An object may work as a narrative device in a film, but this may not translate outside of the film because the object would be taken out of its narrative context. For example the glove that Marlon Brando fondles in Kazan's famous scene in On the Waterfront (Kazan 1954) becomes a very sensual object within the scene itself, but this would not necessarily hold the same meaning if it was taken out of the context of the film. However, no object is devoid of cultural context, be that about the affordances of the object or the semiotic meaning of it, the recognition of archetypes or the recognition of the feel of a material. If this context could be harnessed to create part of the narrative this may create a richer narrative experience for the user.

REFERENCES

Abbott, H.P., 2008. The Cambridge introduction to narrative, Cambridge University Press.

Design Council, 2007. Eleven lessons: managing design in eleven global companies. Desk research report, Design Council.

Anon, 1990. Twin Peaks,

Chatman, S.B., 1978. Story and Discourse: Narrative Structure in Fiction and Film, Ithaca ; London: Cornell University Press.

Cross, N., 2007. Designerly Ways of Knowing, Birkhäuser GmbH.

Crossley, M.L., 2002. Introducing Narrative Psychology. In Narrative, Memory and Life Transitions. University of Huddersfield, Huddersfield, pp. 1–13.

Damasio, A., 2000. The Feeling Of What Happens: Body, Emotion and the Making of Consciousness New edition., Vintage.

Desmet, Peter & Hekkert, P., 2007. Framework of Product Experience. International Journal of Design, 1(1), pp.57-66.

Desmet, Pieter, 2002. Designing emotions, BPR Publishers.

Dunne, A., 2008. Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design, MIT Press.

Frears, S., 2000. High Fidelity,

Greenaway, P., 1983. The Draughtsman's Contract,

Grimaldi, S., 2006. The Ta-Da Series - Presentation of a methodology and its use in generating a series of surprising designs. In 5th International Design and Emotion Conference. Chelmers University of Technology, Goteborg Sweden. Available at: http://arts.academia.edu/SilviaGrimaldi/Papers/543797/The_Ta-Da_Series_-_Presentation_of_a_methodology_and_its_use_in_generating_a_series_of_surprising_designs [Accessed January 30, 2012].

Grimaldi, S., 2008. The Ta-Da Series – A Technique for Generating Surprising DesignsBased on Opposites and Gut Reactions. In P. M. A. Desmet & J. van E. Karlsson, eds. Design and Emotion Moves. Cambridge Scholars Publishing.

Herman, M., 1998. Little Voice,

Kazan, E., 1954. On the Waterfront,

McKee, R., 1999. Story: Substance, Structure, Style and the Principles of Screenwriting, Methuen Publishing Ltd.

Miller, D., 2001. Home possessions: material culture behind closed doors, Berg.

Miller, D., 2008. The Comfort of Things 1st ed., Polity Press.

Norman, D.A., 2009. Memory is more important than actuality. interactions, volume 16(issue 2), pp.pages 24–26.

Norman, D.A., 2003. Emotional Design: Why We Love (or Hate) Everyday Things 1st ed., Basic Books.

Ramis, H., 1993. Groundhog Day,

Stickdorn, M. & Schneider, J., 2010. This Is Service Design Thinking: Basics, Tools, Cases, Amsterdam: BIS.

Tarantino, Q., 1994. Pulp Fiction,

Ward, T.B. & Finke, R.A., 1995. Creativity And The Mind 1st ed., Basic Books.

Weisberg, R.W., 1993. Creativity: Beyond the Myth of Genius 2nd ed., W H Freeman & Co (Sd).

Wright, E., 2004. Shaun of the Dead,

Appendix 6: Grimaldi, S. (2014) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences', in Benz, P. (ed.) Experience Design: Concepts and Case Studies. London: Bloomsbury Academic, pp. 57–68. Available at: http://www.bloomsbury.com/uk/experience-design-9781472569394/ (Accessed: 21 February 2017).

Experience Design

Concepts and Case Studies

Edited by Peter Benz

Contents

Chapter 5

Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences

Silvia Grimaldi

Most people use physical domestic objects, such as kettles, toasters, tables, and sofas, every day without any second thought. We are used to having these objects around. We may think of them when the time comes to replace them, but we don't usually look into the finer details of our interactions with these objects; they come to be part of the background. However, these are objects we interact with on a daily basis, and they allow us not only to fulfill practical tasks, such as toasting bread or boiling water, but also to say something about ourselves through our choices. These objects, partially because of their ubiquity, start to form part of our identity and of our personal narratives.

> We have, each of us, a life-story, an inner narrative—whose continuity, whose sense, is our lives. It might be said that each of us constructs and lives, a "narrative", and that this narrative is us, our identities. (Sacks 1998: 110)

I'm interested in analyzing our first interaction experiences with these mundane objects, the stage before the interaction becomes automatic; then to see how this can influence the way in which this personal narrative around the object is formed, and what role these objects might have in the construction of this narrative. The project analyzes two aspects in parallel: interactions with objects, and the narrative structures of fiction film examples. Following this analysis the aim is to create methods that can apply the findings from this comparison to generate designed objects that "direct" narrative product experiences.

The idea that experiences are described, remembered, and recounted as stories, so much so that it is almost impossible to talk about an experience or an interaction without "telling a story," has been explored in psychology as well as in design literature (Bruner 1991; Dewey 2005; Forlizzi 1997; Hassenzahl 2010; Löwgren 2009).

The field of narrative theory has also been expanding its remit from analyzing literary text to looking at a wider scope of interpretation of narrative. The term *narrative* has been used for a wider variety of mediums, from video games to immersive interactive environments. Real-life experiences, or the recounting or remembering of these experiences, have also been described as having narrative qualities (Abbott 2008; Bal 2002; Young and Saver 2001).

The concept of *narrativity* is important in this shift, as it moves the question from whether an experience *is* or *is not* a narrative to whether an experience *possesses narrativity*; this is intended as a quality, "being able to inspire a narrative response" (Ryan 2005). In addition, narrativity can be seen as a scalar quality, so an event or an experience can be seen as "more or less prototypically story-like," possessing more or less narrativity (Herman 2004).

Narrativity

The concept of *narrativity* lends itself to be adopted by designers because of its adaptability. If we look at an interaction with an object in narrative terms, we are looking at a sequence of events, which present more or less opportunities for being told as an interesting, engaging, and memorable story.

Figure 5.1   Micro-events in the interaction with a kettle.

When looking at a single interaction with an electric kettle, this could be analyzed in terms of *micro-events*: the user might look at the kettle first, then lift the kettle, open the top, fill it with water, close the top, replace the kettle on the base, switch the kettle on, wait for it to boil, hear the sound of the boiling water or the click of the switch or see the steam coming out the top, and then turn the kettle off, pour the water out, and replace the kettle on the base (Figure 5.1).

Each of these can be seen as a micro-event within the object interaction, and these micro-events could be manipulated, or *directed* in a story-like fashion by the designer. In a similar way to a film director, the designer could play with:

- The exact qualities of the micro-events, for example does a whistle alert us to the water boiling? What pitch?

- The way in which these are sequenced, for example a light might get progressively more red as the water gets hotter, or a red light might just turn on when the water boils.

- The meanings formed by interpreting these events, for example a whistle as a scream of distress as opposed to a whistle as an efficient call to attention.

In these ways the designer could influence the meaning that the user will attribute to the story of the interaction.

These micro-events could be looked at according to Desmet and Hekkert's "Framework of Product Experience" (2007), and the variations in the micro-events could be:

- On the level of an aesthetic experience, for example the impression we might get from the colors or textures of the object.

- On the level of experience of meaning, for example the interpretation we might give to culturally relevant details; or

- On the level of emotional experience, for example looking at how the micro-events make us feel.

- These three levels are obviously connected and influence each other throughout the product experience; aesthetic elements will contribute to our creation of meaning around the object, the meaning we form will inform our emotional experience, and so on.

This study proposes an additional level of experience, the narrative experience of an object. This narrative experience is influenced by all three levels described by Desmet and Hekkert (2007), and in turn helps to structure or organize our cognitive processes in relation to all three levels. The advantage of using narrative as a framework is that it would allow designers to apply different aspects of the product experience in a time-based way to design objects in order to direct a user's experience through the micro-events of the object interaction. This could create a highly *tellable* interaction (Baroni 2013), and thus lead to a coherent *story of use*, which has a high level of *narrativity*.

Agency

When we retell a story about an interaction with an object we often give the object human character-istics, such as a "stupid" automatic cash register in a supermarket, or the door lock that won't behave

and let you into your office. It is hard to separate these human-like characteristics from the story; they are part of how we interpret events or happenings within our experience, and part of how we understand and remember the interaction.

In narrative terms, the object's perceived will amount to *agency*. Agency is what distinguishes a "happening," for example "it started to rain," from an "event," for example, "I decided to open my umbrella" (Abbott 2008). In the first example the event recalled is classed as a happening because there is no agency or will that decides to make this happen, while the second event clearly is the result of a wilful decision. Alfred Gell (1998) analyzed the idea of agency in relation to artefacts from an anthropological perspective, and concluded that artefacts possess agency when they allow events to happen "in their vicinity." In Gell's analysis, artefacts then acquire human-like characteristics when they are perceived as having influence on the course of events. We therefore tend to interpret, recall, and retell interactions with particular artefacts as an interaction between two beings, because in this narrative both beings (user and artefact) possess some form of agency.

Mieke Bal, in her book *Travelling Concepts in the Humanities* (2002), goes one step further, using her background in narratology to develop a narrative theory of interpretation. She starts from questioning the typical art–historical focus on the artist's intention when interpreting works of art; she then looks at the agency of the object and how the object itself communicates to the viewer, in ways in which the artist could not have predicted. This shifts the focus of our interpretation from the maker of the work of art to the actual work of art and its agency.

However, from here Bal takes the argument one step further: from the maker, to the object, to the viewer, through the concept of narrativity. Bal focuses on the relationship between the viewer and the object, and how the "story" of viewing and interpreting the object is created in the viewer's mind. This focuses the critique of works of art, and I am extending this to design, away from the artist's intention, through the agency of the object, and to the relationship between the viewer and the object. This relationship is not predetermined but can only be fostered by the maker's intention (Figure 5.2).

The focus on the cognitive activity of the viewer or user implies a narrative, because this activity necessarily happens through time, through an experience of viewing.

> Narrativity is here acknowledged as indispensable, not because all pictures tell a story in the ordinary sense of the word, but because the experience of viewing pictures is itself imbued with process. (Bal 2002: 281).

This leads to a central hypothesis for this project: that objects perceived as possessing agency may have more potential for narrativity. In addition, this model points to the idea that a narrative is always created in a user's mind when interacting with an object, and this narrative is central to the way the user will interpret, remember, and approach the object.

Figure 5.2 Diagram of Bal's theory of interpretation.

Schemata

The idea that the process of story interpretation is an essential part of the activity of the viewer or user is central to constructivist conceptions of narrative. Bordwell (1985), in particular, when talking about the activity of the film viewer, states that the main activity of the (narrative fiction) film viewer is that of creating hypotheses about the way the story will develop, and then validating these hypotheses when the story develops as expected or disproving these when there are surprising turns of plot.

Bordwell explains that this process of story construction is possible because we already have some expectations about the way events develop in everyday life, but we also have expectations about the typical forms of stories, the typical forms of stories within particular genres of films, and the typical roles that agents such as characters, props, etc. might play. This is explained in terms of schemata theory.

Because, in film, schemata aid the viewer to reconstruct the story from the information presented on screen, and aid in the forming of hypotheses, the idea of schemata would be interesting to apply to the design of objects. Two of the schemata that Bordwell describes would be particularly valuable as a method of constructing narratives around object interactions.

Prototype schemata allow us to identify agents such as characters, props, and locales as contributing something to the story, for example a character with a gun might be perceived as criminal or as someone who could potentially perform a criminal act. These agents allow us to start making some hypotheses about the way in which they will behave, or, in the case of objects or locales, the way in which the characters might behave in their proximity, and then it is up to the filmmaker to either validate or invalidate these hypotheses.

Prototype schemata in film use the semiotic understanding of the audience to drop clues into the story, which may or may not lead in the right direction, but will nonetheless be understood by a "typical" (and culturally specific) member of the audience. In parallel, semiotic understanding is often used in design to give clues to users about usability and interpretation of objects; however, there is a potential for the designer to "play" with the idea of hypothesis validation or non-validation, which could lead to designs that reveal themselves with time to be surprising (Grimaldi 2008, 2006).

Template schemata represent abstracted narrative structures that allow the viewer to slot information into the right sequence when reconstructing a story. So a story that is told in an order that is different from chronological can be understood in the correct chronology because we have these template schemata to assist us in "filing" the information into the correct place. For example, a sequence of cause-and-effect, regardless of what order it is presented in the film, will have to be unraveled in the viewer's mind in a more or less chronological order for the viewer to understand which event might be the cause and which might be the effect. Incidentally, stories that are told in a way that is close to these template schemata are easier to remember, and, regardless of what order the story was told in the original film, viewers will make the story conform more to the template schemata when retelling or recalling.

Template schemata have to do with the understanding of the way time is organized within the film, and in a similar way could help in the understanding of time within the interaction experience, creating, for example, patterns of surprise and predictability within the experience, or creating different rhythms and "dramaturgical structures" to the experience (Löwgren 2009).

In addition, template schemata could help in the formation of cause-and-effect patterns, so that if an object behaves in a certain way we might ascribe a cause to that behavior through a template

schemata. An everyday example of this is when the TV remote control is not working consistently, and we may try to turn it upside down; if it happens to work that time we tend to interpret that event as being the cause of the remote control starting to work again, and the next time we will try to turn the remote control upside down again to make it work.

Designers could use template schemata to organize micro-events within an interaction that happen over time in a way similar to a typical story structure; this might aid or foster the memorability of the object interaction, as well as the narrativity of the experience and the *tellability* of the object.

The result of applying these schemata to designing objects might be that the object actively encourages an increase in the gusto that someone might have in retelling the story of their interaction, thus fostering word of mouth and increased recall.

Analysis of film examples

The project is interested in outlining methods for designers to increase narrativity within the product experience. Therefore the idea is to analyze narrative elements of films in which the selected objects play a significant role, and then to apply these to the design of the objects themselves.

The first step in this process is to select a sample of objects and films and then analyze these in order to understand what elements could be incorporated into the object redesign. To select the objects a questionnaire was circulated online through message boards of people who were local, so that they could conveniently be involved with further stages of testing, and that were somehow interested in objects. More than 70 people replied to the questionnaire, which asked them to identify the first five domestic objects that come to mind and the three domestic objects they most enjoy using and why. Objects that could not be redesigned for technical reasons, for example TV sets, and objects that would prove testing problematic, for example beds, were discarded (Grimaldi 2012). The final selection was to be the kettle, toaster, sofa, and table.

As the overall project is still in progress, it is being piloted with the kettle. In order to identify films in which the kettle appears in a narrative role, a questionnaire was posted on the Internet Movie Database (IMDb) forums, asking forum participants, who tend to be film enthusiasts, to identify film scenes in which the object appears and plays a significant role. This method was preferred over trawling script databases for references to kettles, as the point was to identify those scenes in which the object had some sort of memorable impact, and resonated with the viewer, whether in the narrative construction of the scene or in the formation of meaning, as opposed to identifying scenes in which the object simply appears. For each object, four or five films were selected, taking care to have some variation in genres of films as well as in narrative roles the objects perform (Grimaldi 2013).

For the kettle pilot the films selected were

- *Vera Drake* (Leigh 2004): a historical drama in which the kettle helps establish the character of Vera as a caring individual, and helps to frame her activity of providing illegal abortions as a caring act.

- *Wristcutters: A Love Story* (Dukic 2006): a comedy in which the kettle's whistle is used as a device to cut from one scene to another.

- *A Tale of Two Sisters* (Kim 2003): a psychological horror in which a boiling kettle is used as a weapon.

- *Secretary* (Shainberg 2002): a comedy/drama/romance in which the kettle is used to establish a domestic calm scene but in that same scene is then used as a masochist's tool.

The film scenes were analyzed from different points of view. The first level of analysis followed McKee's guidelines (1999), looking at dividing the scenes into beats or actions and noting down the timing of those beats. Then each scene was analyzed in terms of conflicts and goals of the characters as well as any changes in values and turning points in the beats. In addition to the analysis based on McKee's framework, the films were also analyzed in terms of the role of the objects in the particular scenes, noting any points in which the objects change meaning or in which the meaning of the object influences our understanding of the scene, noting the perceived agency of the object.

Pictured in Figure 5.3 is the "kettle scene" from the film *Secretary* (Shainberg 2002). This scene unfolds as the opening credits finish rolling and it has been established that the protagonist has just left a mental institution and is trying to stop self-harming after coming back into the family home.

The "kettle scene" starts with a calm domestic evening setting, with the protagonist in a bathrobe making tea; the calm is interrupted by a violent fight between her mother and her drunk father. The protagonist grabs the now boiling kettle, calmly brings it up to her room, and proceeds to burn herself with it on her inner thigh. This seems to relieve her apprehension, ending the scene on a calm note. However, we as an audience know that her goal is to keep herself from self-harming, so this is a very ambiguous resolution to the scene as the apparent calm is actually a very negative development for the plot.

The kettle has a dual role in this scene: that of establishing a calm domestic scene, but also of being a catalyst for action—it is a loaded weapon and by being hot it is ready to use. The pacing of the scene is also interesting; starting out with longer beats, progressing through the middle of the scene in short

Figure 5.3 Scene from *Secretary*.

Title: Secretary
Scene: 7.02 to 8.22 min
Object: kettle

Year: 2002
Genre: comedy, drama, romance
Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10 10 10 5 5 15 25

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved

Figure 5.4   Beats within the "kettle scene" in *Secretary*.

beats with sharp editing and cuts, and then resolving in a long final beat in which the ambiguous nature of the restored balance is made evident.

The film examples are used as starting points for the redesign of the objects in different ways through the idea generation process for the new designs. Some of the narrative devices of the films are incorporated into the idea generation process. The roles or meanings of the objects are used as starting points for design, by looking, for example, at the role reversal between the kettle as a symbol of domestic calm and the kettle as an available weapon. And the timing and structure of the beats within the scenes is used as an organizing principle for the micro-events within the interaction experience (Figure 5.4). Each of these approaches could lead to different design outcomes based on the four films analyzed.

Analysis of product experiences

As a comparison to the film analysis, and also to act as a first stage of testing against which to test the final designs, participant research was used to analyze the interaction experience of using a kettle.

The participants were asked to film themselves using their own kettle at home. They then emailed the video to the researcher before their scheduled interview, so the researcher conducting the interview would be familiar with it. The interview was conducted in three phases. The first phase consisted of the researcher briefly interviewing the participant about their use of the kettle; the second phase was conducted while both participant and researcher watched the video of the kettle use, and the participants were asked to talk the researcher through the video.

Figure 5.5   Storyboard 1.

It is interesting to note that the answers to the second phase were different from the first phase answers, proving the need for such triangulation and for the use of video. First of all the participants spoke more in depth about the details of the way in which they use the object, prompted by watching themselves on screen. But also the unexpected result was that the participants were more open, admitting to quirks of use, such as performing a "limescale inspection" before filling the kettle, or about always rushing to the kettle as soon as it boils, claiming "I don't like to let hot water wait, it defeats the point in my opinion." One participant even admitted to reorganizing all her kitchen things, putting the more expensive things to the front and hiding the cheap tea, although this obviously defeats the point of moving things around in the first place.

The third phase of the interview consisted in giving the participants drawing and collage materials, and asking them to create a storyboard of their use of the kettle (see Figures 5.5 and 5.6), followed by a few final questions about this storyboard exercise. One participant said that having to draw her kettle she realized that she doesn't really know where the on/off switch is located, nor what color this is: she remembers that the color of this light changes when the water boils, but is not sure from which color to what color.

This storyboarding exercise also forced the participants to divide their interaction experiences into micro-events and this information came in useful when mapping the micro-events within this interaction to see which ones could be acted upon or modified. Daniel Stern's (2004) work with visualizing interview data about "the present moment" was used to codify sequences of micro-events within the product
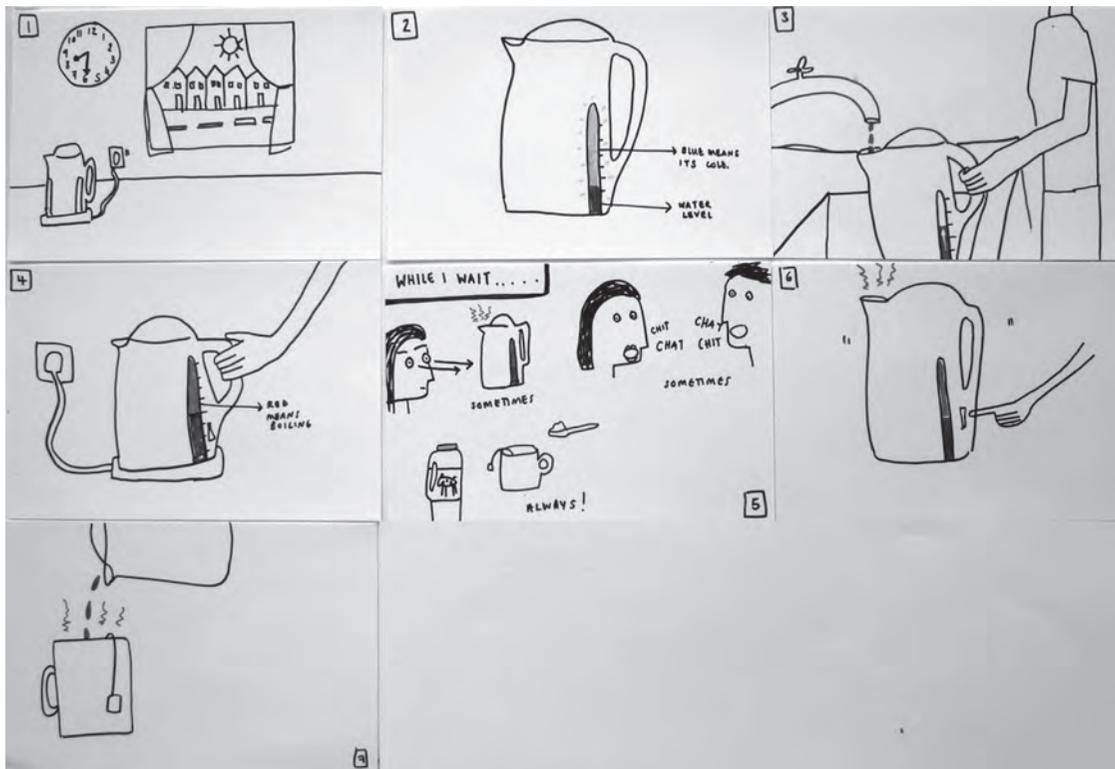
Figure 5.6 Storyboard 2.

interaction experiences, in a way that is similar to the film analysis shown above, so as to easily compare the data visually.

The information about micro-events in the kettle use and quirks of use that emerged from the participants is useful when redesigning the kettle to provide recognizable additional connotations.

Design applications

This section outlines the methods that are being used as starting points for design. The key point of the theoretical framework is that of measuring, at least in a subjective way, the tellability of the redesigned objects. The final designs will be tested against the initial objects to measure whether there has been an increase in narrativity of the object interaction.

The film analysis provides the raw narrative material to be adapted and adopted into the designs. This material comes from ideas around the form of the narrative (discourse) or the content of that narrative (story) (Abbott 2008). So, for example, the meaning of the kettle in a particular scene leads to a series of design ideas and concepts (content), which may be varied in terms of how the object is experienced in interaction (form) according to particular template schemata found in the films.

Some of the briefs that have emerged so far have to do with:

- *Role reversals*: the kettle is usually interpreted as a reassuring object, but also has the potential of being used a weapon; this reversal of roles is used in the designs through contrasting connotations and through timed sequences of changes. One sample design is a kettle the handle of which leaves a pattern imprinted on the user's hand, which could be seen as a scar but in a positive light.

- *Micro-event structures*: particular structures and timings of beats and scenes within a film are used within the kettle experience: the micro-events in the kettle experience are reorganized or timed so that particular events take more time and others are quicker, or so that there is a timing to a setting of the scene, climax of the scene and closure similar to that found in some of the film scenes. One sample design for this is a kettle that instead of signaling when the water boils it progressively starts glowing as the water gets hotter.

- *Narrative devices or tropes*: kettles are often used in films, and in particular, in the film analyzed, to cut from one scene to another, through the use of the whistle, the steam, and the sound of the water boiling. These time markers are used within the redesigned product experience as signifiers of changes in state or changes in meaning. One sample design is a kettle in which the whistle changes in sound, sometimes resembling a child's scream, giving a sense of urgency, and sometimes whistling in a pleasant pitch.

- *Symbolic meaning of the kettle*: the idea that a kettle can establish a character as caring or a scene as calm and domestic, is used within the redesign, both by being subverted, and by being reinforced or played with in an ambiguous way. One sample design for this is a kettle "clothed" in a knit sweater, with pockets to warm your hands.

The analysis of the participant interviews provides the raw material in terms of mapping the object interaction experience and in addition provides a ground to test the final designs against. The final

designs will be tested again with the participants, following the same methods of the initial testing, and the interviews will then be analyzed and visualized in the same way as the original. This will provide a good ground for testing whether there has been an increase in narrativity of the interaction experience.

The final aim of the project is to provide designers with a series of methods they can experiment with in the creation of designs that foster more narrative experiences. This is not to be seen in contrast with other design methods or focuses, nor is it to be seen in opposition to other ways of using narrative within the design process, such as scenarios for empathizing with users (Blythe and Wright 2006; Wright and McCarthy 2008). It is instead intended to add a layer of understanding to the design of product experiences and to guide designers in the different ways in which they could use this additional layer.

Appendix 7: Grimaldi, S. (2013) 'Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions', in Nordes 2013: Experiments in design research Online proceedings. The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation, pp. 374–377. Available at: http://nordes.org/nordes2013/ (Accessed: 17 October 2017).

STORY OF USE: ANALYSIS OF FILM NARRATIVES TO INFORM THE DESIGN OF OBJECT INTERACTIONS

SILVIA GRIMALDI

UNIVERISTY OF THE ARTS LONDON

S.GRIMALDI@LCC.ARTS.AC.UK

ABSTRACT

Not only is using a product an experience, it is an interaction and it is narrative in nature. This work in progress paper describes the narrative theory background for this statement, in particular schemata theory and the concepts of agency, tellability and narrativity, then describes methods that are being used in the project to analyse film narratives and apply these to the design of tellable physical products.

INTRODUCTION

The aim of this project is to analyse an interaction with an object as a narrative, and to analyse the narrative structures and effects of other narrative mediums, for the scope of this project limited to examples from fiction film, and create methods that can apply findings from this comparison to generate designed objects which "direct" *tellable* product experiences.

The premise is that not only is using an object (any object) an experience, it is an interaction and it is narrative in nature. The theoretical framework comes at the intersection of two lines of thinking that can be looked at in parallel – on the one hand there has been research around the idea that experiences are described and remembered as a story (Bruner, 1991; Dewey, 2005; Forlizzi, 1997; Hassenzahl, 2010), and on the other hand the field of narrative theory has been lending itself to wider interpretations of what narrative is, that are less tied to a specific medium, the literary text, and are open to accepting other mediums but also real life experiences, or the on-the-spot or a posteriori recounting of experience, as having narrative qualities (Abbott, 2008; Bal, 2002; Young and Saver, 2001).

The project develops this premise by cross-fertilising the design of objects, in particular non-digital domestic objects, with narrative techniques, patterns and roles derived from the analysis of specific film examples. In other words, someone using an object will experience a sequence of events (or micro-events) related to this use; in the case of a kettle the user will approach the kettle and see it, then fill it with water, place it on its base, turn it on, wait for it to boil, possibly notice the noise of the boiling water or the steam coming out of the kettle, then the kettle will turn itself off (or is turned off) and the user pours the boiling water and places the kettle back on its base. By manipulating or "directing" what these micro-events are, how and when they happen and what they communicate or represent to the user, and by creating consciously structured sequences of micro-events within this "single-use" experience of a kettle either from the point of view of physical interaction or from the point of view of emotional or cognitive responses, then the designer may be able to increase the *tellability* of this experience. *Tellability* refers to the noteworthiness of the events being related; high *tellability* in an event will then lead to high *narrativity* of the related story (Baroni, 2013).

LITERATURE AND THEORY

Looking at physical domestic products as creating or prompting narratives when they are interacted with suggests an exploration of a few different theoretical fields; material culture anthropology looks at the significance of domestic products in the construction of identity (Miller, 2008); the literature on experience psychology explores how experiences are assimilated and evaluated over time (Bruner, 1991; Hassenzahl, 2010); ideas explored by interaction design about the way people interact with objects, using stories, performances or trajectories (Gaver et al., 2003; Laurel, 2004; Löwgren, 2009; Benford et al., 2009), though the focus tends to be on digital objects; as well as studies of narrative theory which can provide insights on narrative construction and interpretation (Abbott, 2008; Bal, 2002; Bordwell, 1985). Because of the limits of the conference paper format I will focus on those areas of narrative theory that may prove useful in the design process and in structuring design briefs.

Narrative theory is used as a framework for this study because of the relevance of narrative in the forming of identity (Sacks, 1998) as well as the idea that our experience of the world is mediated through a narrative understanding (Bruner, 1991; Young and Saver, 2001), our interpretation of reality through memory or recall is also guided by narrative principles (Abbott, 2008; Bordwell, 1985; Young and Saver, 2001) and our ability to empathise is greater when information is presented in narrative form (Danko, 2006; Wright and McCarthy, 2008). Everyone has probably told a story about an interaction with an object, for example a story about using a particularly "stupid" automatic cash register at the supermarket; these stories become part of how the object is experienced, understood and remembered.

Often, stories told of objects have the effect of humanising these and giving them anthropomorphic characteristics. So the automatic cash register at the supermarket may be "stupid" and "slow". In this way the story is often retold or recalled as an interaction between two beings which both possess some form of *agency* or will; according to Gell (1998) artefacts (which he groups under the term art) possess agency when they allow things to happen "in their vicinity", in other words when they are perceived as having a will. Bal (2002) goes one step further and moves the focus of an object's interpretation from the maker (artist's intention) to the object (agency of the object) and on to the viewer (or user) through the concept of *narrativity*: this emphasises the relationship between the viewer and the object, seen as a story of viewing and interpreting the object, not predetermined but only fostered by the designer's intention. This cognitive activity is narrative because it happens through time: "Narrativity is here acknowledged as indispensable, not because all pictures tell a story in the ordinary sense of the word, but because the experience of viewing pictures is itself imbued with process." (Bal, 2002, p281). This leads on to the hypothesis that objects perceived as possessing *agency* may have more potential for *narrativity*, and to the idea that a narrative is created in the user's mind when interacting with an object, and it is central to the way the user interprets the object.
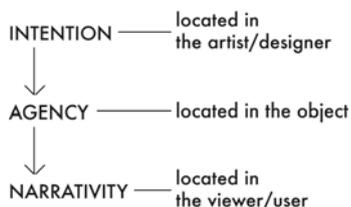
Figure 1 - Conceptual model of three levels of interpretation – Adapted from Bal (2002)

Out of this conceptual model (Figure 1) it is interesting to draw parallels with constructivist conceptions of narrative; In particular Bordwell (1985) talks about the activity of the film viewer as being one of story construction: "the viewer's comprehension of a story is the principle aim of narration" (p30) and the main activity of the (narrative fiction) film viewer is that of creating hypothesis about the story and then validating or disproving these hypothesis as the film develops. This is then explained by Bordwell in terms of *schemata theory*: we have a set of learned notions about how the narrative will develop that come from every day experience (including the experience of watching films).

According to Bordwell (1985), we have four types of schemata at work when viewing a film. *Prototype schemata* allow us to identify agents such as characters, props and locales as contributing something to the story, for example a character with a gun will be perceived in a certain way. *Template schemata* represent abstracted narrative structures that allow the viewer to slot information into the right sequence when reconstructing a story. So a story that is told in an order that is different from chronological can be understood in the correct chronology because we have these template schematas to assist us in "filing" the information into the correct place. Incidentally, stories which are told in a way that is close to these template schematas are easier to remember, and, regardless of what order the story was told in the original film, viewers will make the story conform more to the prototype schemata when retelling or recalling. *Procedural schemata* have to do with the viewer's understanding of the story; these are the relationships between the parts of the story that don't necessarily relate logically but might be perceived as related because they are typical of a particular genre, or because they are necessary to the construction of an elegant story. *Stylistic schemata* have to do with the style elements of the film medium, such as camera shots, lighting, etc. Schemata aid story recollection and allow viewers to be surprised by a story event which does not conform to the hypothesis they had made, and allow the viewer's hypothesis to be validated by a story event that does follow the viewer's expectations.

In particular prototype and template schemata could be applied to the design of objects; prototype schemata play on semiotic understanding and classification of clues, so in an interaction with an object this could be visual clues about the form of the object which makes the user construct an understanding of that object based on prior knowledge or experience, or clues from the way the object behaves which might prompt the user to assign it a personality. Template schemata relate to the way we expect the experience with the object to develop over time, validating or invalidating hypothesis to create patterns of surprise or predictability, and this could have some interesting applications especially to the design of objects which vary their behaviour, or when we can ascribe some form of cause and effect relationship to events that happen in a sequence. So if our broken laptop turned on when the cover was lifted "just so" we tend to ascribe a general cause and effect rule and to repeat the gesture. But also if micro-events within an interaction happen over time in a way similar to a typical story structure it might aid or foster the *narrativity* of the experience and the *tellability* of the

2

object. So the result of applying these schemata to designing objects might be that the object actively encourages an increase in the gusto that someone might have in retelling the story of their interaction, thus fostering word of mouth and increased recall.

DATA AND METHODS

In light of the theoretical model outlined above the project analyses film examples in which the objects selected for redesign appear in a narrative role and takes elements of how the story is told in the film to apply these to the design of the object. The first step has been to select a number of domestic objects through an online questionnaire and to select a number of films in which these objects appear. The films were selected through the Internet Movie Database Forum, asking the forum participants to identify scenes in which the selected objects play a significant role because they resonated and were memorable, as opposed to films in which the objects simply appeared. Suggestions were then divided by object and for each object four or five films were selected, taking care to have variation in genres for each object and in roles these objects take on.

This project is being piloted with the kettle. The films selected for this pilot were *Vera Drake* (Leigh, 2004) a historical drama in which the kettle helps establish the character of Vera as a caring individual, and helps to frame her activity of providing illegal abortions as a caring act; *Wristcutters: A Love Story* (Dukic, 2007) a comedy in which the kettle's whistle is used as a device to cut from one scene to another; *A Tale of Two Sisters* (Kim, 2003) a psychological horror in which a boiling kettle is used as a weapon; and *Secretary* (Shainberg, 2002) a comedy/drama/romance in which the kettle is used to establish a domestic calm scene but in that same scene is then used as a masochist's tool.

Figure 2 - Scene from Secretary (Shainberg, 2002)

The film scenes were analysed according to McKee's guidelines (1999) focussing on turning points, timing of beats of action, conflicts and goals, but adding some detail about the role of the object in the scene, which relates to the idea of the object having *agency*.

The film examples will be used in different ways as templates or starting points for the design of the object experiences, for example by incorporating narrative devices such as shifts of roles or meaning, timing structures and symbolic uses of objects. In particular the scene described above has led to several briefs; some

examples are to design a kettle which performs a role reversal, from reassuring to threatening, and to design a kettle with a similar time structure of micro-events to the beats of the scene. Other briefs developed so far have to do with the kettle as establishing a caring role (based on *Vera Drake*); comparing different structures and timing of the film sequences, which can be used to organise micro-events within the kettle use; looking at the whistling of the kettle as a film trope or device, such as in *Wristcutters;* and a cross-film brief about the different roles the kettle takes on in different films.

In parallel to the film analysis, participants were recruited to analyse the experience of use of a kettle. For this pilot a convenience sample was used, asking students to participate; after the pilot and for the testing of the objects the participants will be recruited from the respondents to the initial questionnaire to select the objects. The participants were asked to film themselves while using their own kettles, and were then interviewed about this experience. The interview was conducted in two phases; first the participant was asked to describe how they use a kettle, in what circumstances and what they do while they wait for the water to boil. Then the video of the experience was shown and the interviewer asked the participant to "talk me through the video". Interestingly the participants were a lot more open about describing their quirks of use while watching the video: one participant described how she inspects the kettle for limescale before each use, while another talked about the fact that she doesn't "like to let hot water wait, it defeats the point in my opinion".

The final step in the participant involvement was to create a storyboard of their use of the kettle, and to answer a few final questions about whether they enjoyed the storyboard exercise. Because the participants were not necessarily familiar with drawing or with storyboard techniques they were provided with cut outs of faces, bodies, hands and kettles at different sizes and scales which they could collage into the storyboard. An example is shown in Figure 3.

Figure 3 - sample storyboard of kettle use

The data coming from the participant interviews, analysed in terms of sequences of micro-events but also quirks of use, will be useful in conjunction with the briefs coming from the film analysis to formulate new designs, and narrative theory elements such as schemata will be used to frame how micro-events are experienced by the user in time. The participant research will also test the narrativity of the experience of the kettle: once the objects are redesigned these will be tested in the same way as the initial objects were tested with the participants. The final aim is to assess whether the project led to objects with an increased *tellability*, which therefore increased the *narrativity* of the experience.

RESULTS AND DISCUSSION

Though the study is in progress, the work done so far shows the potential of applying elements from narrative theory as well as practical examples of story construction from film to the design of objects as *tellable* interaction experiences, and the parallel analysis of the role of the objects in films (which tends to be more extreme) and the object use experiences provides a comparison platform to start applying these ideas into designed objects. The idea of schemata could be useful to designers in terms of building a recognisable story structure, and the concepts of *agency* and *narrativity* could aid in creating objects that are more *tellable*, fostering or directing events that when retold lead to stories with increased *narrativity*.

The study of narrative theory could therefore lead to a better understanding of how designers can incorporate narrative elements such as logical connections between events, template schemata or agency and perceived agency of objects into the design of objects. This is not in contrast to other approaches such as looking at the creation of meaning in objects or the emotional effects of a design, but it is instead intended as an additional narrative dimension that designers can consider, in addition to those already widely used such as scenarios.

REFERENCES

Abbott, H.P., 2008. The Cambridge introduction to narrative. Cambridge University Press.

Abbott, H. Porter: "Narrativity". In: Hühn, Peter et al. (eds.): the living handbook of narratology. Hamburg: Hamburg University Press. URL = hup.sub.uni-hamburg.de/lhn/index.php?title =Narrativity&oldid=1580 [view date: 09 Jan 2013]

Bal, M., 2002. Travelling Concepts in the Humanities: A Rough Guide. University of Toronto Press, Toronto ; London.

Baroni, Raphaël: "Tellability". In: Hühn, Peter et al. (eds.): the living handbook of narratology. Hamburg: Hamburg University Press. URL = hup.sub.uni-hamburg.de/lhn/index.php?title= Tellability&oldid=1577 [accessed: 09 Jan 2013]

Benford, S., Giannachi, G., Koleva, B., Rodden, T., 2009. From interaction to trajectories: designing coherent journeys through user experiences, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. pp. 709–718.

Bordwell, D., 1985. Narration in the Fiction Film. Univ of Wisconsin Press.

Bruner, J., 1991. The narrative construction of reality. Critical inquiry 18, 1–21.

Danko, S., 2006. Humanizing design through narrative inquiry. Journal of Interior Design 31, 10–28.

Dewey, J., 2005. Art As Experience. Perigee Books.

Dukic, G., 2007. Wristcutters: A Love Story.

Forlizzi, J., 1997. Designing for Experience: An Approach to Human-centered Design.

Gaver, W.W., Beaver, J., Benford, S., 2003. Ambiguity as a resource for design, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '03. ACM, New York, NY, USA, pp. 233–240.

Gell, A., 1998. Art and agency: an anthropological theory. Clarendon Press.

Hassenzahl, M., 2010. Experience Design: Technology for All the Right Reasons. Morgan & Claypool Publishers.

Kim, J., 2003. A Tale of Two Sisters.

Laurel, B., 2004. Design Research: Methods and Perspectives. MIT Press.

Leigh, M., 2004. Vera Drake.

Löwgren, J., 2009. Toward an articulation of interaction esthetics. New Review of Hypermedia and Multimedia 15, 129–146.

McKee, R., 1999. Story: Substance, Structure, Style and the Principles of Screenwriting. Methuen Publishing Ltd.

Miller, D., 2008. The Comfort of Things, 1st Edition. ed. Polity Press.

Sacks, O.W., 1998. The man who mistook his wife for a hat and other clinical tales. Simon & Schuster, New York.

Shainberg, S., 2002. Secretary.

Wright, P., McCarthy, J., 2008. Empathy and experience in HCI, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08. ACM, New York, NY, USA, pp. 637–646.

Young, K., Saver, J.L., 2001. The neurology of narrative. SubStance 30, 72–8

4

Appendix 8: Questionnaire to select objects and answers breakdown

Appendix 8 questionnaire to select objects and answers breakdown

Questionnaire

In ad on discussion boards or social media:

I am a research student at the University of the Arts London and I am working on a research project investigating people's relationships with domestic objects. I have put together a short questionnaire about domestic objects and I would be grateful if you could answer these two questions.

I'm posting the questionnaire on this board because I believe it will reach people with an interest in domestic objects. You are obviously free not to take part but your contribution would be greatly valued. By participating in this survey there is no obligation to participate in any future development of the project and you have the option to state whether or not you would like to be contacted about future research for this project.

In questionnaire:

I am a research student at the University of the Arts London and I am working on a research project investigating people's relationships with domestic objects. I would be grateful if you could answer the two questions below.

You will not be identified by name or email address in any published work. By participating in this survey you agree to the researcher using your anonymous answers as part of any future publications. You are obviously free not to take part but your contribution would be greatly valued.

There will be additional stages to this research and I will be looking for participants to take part in these. By participating in this survey there is no obligation to participate in any future development of the project. You have a chance at the bottom of the survey to indicate whether you would be interested in participating in further stages of this research or if you would like to be contacted with the results.

Question 1:

Please list the first five domestic objects that come to your mind

1 _____

2 _____

3 _____

4 _____

5 _____

Question 2:

Which 3 domestic objects do you most enjoy using and why? (these do not have to be the same objects as the ones you listed in question 1)

1 _____

Why?

_____

_____

2 _____

Why?

_____

_____

3 _____

Why?

_____

_____

At the bottom of the page:

Would you be interested in being contacted about future research for this project? yes/no

email address _____ (email will be stored on database in password protected university computer and on a password protected university network. Email addresses will be kept only for the purpose of participant consent and optional further contact and will not be published anywhere or shown to third parties)

Do you live in or around London? Yes/no

Would you be interested in being contacted with the results of this study? yes/no

On feedback page:

Thank you for taking the time to complete this survey, your time is appreciated. If you have any feedback, questions or to report a problem please contact the researcher: Silvia Grimaldi at s.grimaldi1@arts.ac.uk

Where it was posted

2 march 2012:

freecycle cafe london board

facebook

twitter (with hashtags)

http://www.diynot.com/forums/viewforum.php?f=25

9 March

twitter

forum carbootsrus.com - couldn't go through because of URL

gumtree - in community

11 march

http://www.hallolondon.co.uk

23 March

http://www.hallolondon.co.uk

goodreads

craigslist London

26 March

Netmums – member request boards

Results analysis

totals	first 5 come to mind		totals	3 most enjoy using		Final shortlist	
21	bed		16	bed		sofa	
20	washing machine		13	tv		kettle	
19	kettle		13	computer		toaster	
16	table		12	washing machine		table	
15	fridge		12	sofa			
15	sofa		11	kettle		**other possible**	
15	TV		10	coffee-maker		iron	
			6	cooker		coffee maker	
12	chair		6	blender		cup	
11	iron		5	vacuum cleaner		blender	
11	toaster		5	cup			
11	vacuum cleaner		4	toaster			
10	compu		4	oven			
8	coffee-maker		4	knife			
8	cooker		4	kitchen table			
8	dishwasher		4	iron			
8	microwave		4	dishwasher			
8	plate		3	pan			
7	lamp		3	mixer			
6	cup		3	microwave			
5	blender		3	glass			
5	broom		3	fridge			
5	oven		3	bottle opener			
4	bookcase		2	toothbrush			
4	kitchen table		2	toilet			
4	rug		2	stereo			
4	toilet		2	steam cleaner			
3	dryer		2	radio			
3	mixer		2	pot			
3	pillow		2	mirror			
3	pot		2	laptop			
3	radio		2	lamp			
2	cat		2	bread maker			
2	desk		2	bath			
2	food processor		1	tweezers			
2	glass		1	table			
2	hair dryer		1	stool			
2	mop		1	spoon			
2	peeler		1	soda maker			
2	phone		1	slow cooker			
2	sink		1	shower			
2	slipper		1	sewing macine			

2	spoon		1	record player			
2	stool		1	pillow			
1	ashtray		1	phone			
1	bath		1	mobile phone			
1	bin		1	masher			
1	blanket		1	lighter			
1	blind		1	light			
1	boiler		1	kitchen utensils			
1	book		1	ipod			
1	breadmaker		1	freezer			
1	cleaner		1	dustpan and brush			
1	coffee-table		1	decanter			
1	comforter		1	cushion			
1	curtains		1	curtains			
1	cushion		1	clippers			
1	decanter		1	chair			
1	dresser		1	cat			
1	dustpan and brush		1	can opener			
1	duvet		1	bookcase			
1	end table		1	boiler			
1	feeding chair		1	beautiful			
1	fire		1	barbeque			
1	freezer						
1	hair brush						
1	ham slicer						
1	hose						
1	hot water bottle						
1	ironing board						
1	key						
1	kitchen utensils						
1	knife						
1	laptop						
1	light						
1	light fitting						
1	lighter						
1	mirror						
1	mobile phone						
1	notebook						
1	pan						
1	radiator						
1	rice cooker						
1	ring						
1	shower						
1	sieve						
1	soda maker						
1	spatula						
1	stereo						
1	teapot						

1	tin						
1	toothbrush						
1	water bottle						
1	whisk						
1	window						

Full Answers

Response ID	1.:Please list the first five domestic objects that come to your mind	2.:Please list the first five domestic objects that come to your mind	3.:Please list the first five domestic objects that come to your mind	4.:Please list the first five domestic objects that come to your mind	5.:Please list the first five domestic objects that come to your mind	1.:Which three domestic objects do you most enjoy using and why?	Why(object 1)?:Which three domestic objects do you most enjoy using and why?	2.:Which three domestic objects do you most enjoy using and why?	Why(object 2)?:Which three domestic objects do you most enjoy using and why?	3.:Which three domestic objects do you most enjoy using and why?	Why(object 3)?:Which three domestic objects do you most enjoy using and why?	Yes:Would you be interested in being contacted about future research for this project?	No:Would you be interested in being contacted about future research for this project?	Yes:Do you live in or around London?	No:Do you live in or around London?	Yes:Would you be interested in being contacted with the results of this study?	No:Would you be interested in being contacted with the results of this study?
1	vacuum cleaner	light fitting	sieve	bookcase	mirror	mirrors	Light reflection, playing with apparent spaces, brightening dark spaces.	small sharp knife with wooden handle				Yes		Yes		Yes	
2	Knife	Vegetable peeler	Food processor	Washing machine	My favourite chair	My favourite mug	It was made by my closest friend, is aesthetically pleasing, and brings her to mind every day when I drink from it.	My best knife.	I prepare a lot of vegetables, but I find it hard to find a knife that is suited to 'left-handers' - this was a present from one of my daughters and works perfectly for me.	My cast-iron 'cauldron'	It's a very satisfying pot to use - even if I could have used something smaller, I tend to use it every day.	Yes		Yes		Yes	
3	kettle	toaster	tv	cooker	fridge	tv	entertainment	kettle	hot drinks/soup	fridge	cold drinks	Yes		Yes		Yes	
4	cup	kettle	spoon	tin	plate	large 1970s soup pot	can be used to make lots of food for parties, looks great, was only 1euro from flee market and has second well used life and can be used to hold punch at parties when not being cooked in	ercol sofa	flee market sofa re upholstered in african fabric from deptford - has a hostory and looks lovely and cool. is comfortable.	Espresso Maker	makes good coffee, takes a bit of time to do and looks good	Yes		Yes		Yes	
5	Hair Dryer	Couch	Mop	Dishwasher	Plate	Dishwasher	saves me from a hassle	Bed	helps me rest and is my sanctuary also my reading and watching place	bottle opener	always seems to lead to good times		No		No	Yes	
6	Coffee pot	Vacuum Cleaner	Stand Mixer	Food Processor	Soda maker	Coffee pot	In truth because I am almost addictively reliant on coffee. My coffee maker prepares wonderful coffee and the pot keeps it warm for hours.	Stand Mixer	I simply love to bake, and the mixer allows me to make very challenging recipes with minimal effort.	Soda Maker	I drink approximately six litres of carbonated water daily. My soda maker carbonates the water for me. it is cost effective and convenient,				No	Yes	
7	Microwave	Vacuum Cleaner	Toaster	Kettle	Rice cooker	Blender	It's fun seeing things chopped up with no effort.	Slow cooker	So easy to use and just have to forget about it.	Bread maker	It's fun adding ingredients and trying new things.	Yes		Yes		Yes	
8	Oven	Refrigerator	Computer	Toilet	Bed	My Bed	SLEEP	Computer	Shopping and social networking	Stove	Cooking	Yes		Yes		Yes	
9	computer	ring	book	chair	table	coffee machine	enjoy the ritual, from basic ingridients, (water and coffee powder to a brillian drink. and the phisic behind.	apri scatole	it is genious, just turng the thingy (with not sforzo) you can open something which would be unopenable			Yes		Yes		Yes	
10	teacup	plate	desk lamp	sofa cushion	hot water bottle	black teacup with white dots	Even though they certainly exist in my daily life, there are few rituals that I am so conscious of as the 'making a cup of tea'. It usually means that I am sitting down, either outside in the garden or on the sofa, or at the kitchen table, and I am reading or writing emails… It's also sometimes the start to working, marking that moment of sitting down and getting on with it. My favourite cup at the moment is a black one with white dots, that are slightly raised, maybe due to the way it was fired. I have had it for a few years: I took it with me when we moved out of a shared house years ago, and no one else laid claim to it.	owl-shaped bottle opener	I bought it on a fleamarket in Athens a few years ago, very very cheaply, and the owl has simply the nicest smile. Always makes me smile in return, whenever I use it.	tooth brush	It's an electric toothbrush, and there is something very satisfying about using it. I tend to close my eyes when brushing my teeth, so that I can better concentrate, and it almost becomes a little meditative…		No	Yes			No
11	oven	dishwasher	washing machine	dryer	vacuum cleaner	washing machine -	can't be bothered washing by hand	vacuum cleaner	less time consuming	steam cleaner	reduction of dust mites	Yes		Yes		Yes	
12	Bed	Bath	Cooker	TV	Radio	Bed	I sleep in it, make love in it and lie on it to watch TV. I spend a significant proportion of my life there.	Bath	Two or three times a week I get to spend an hour (or more) lying in some nice warm water with a can of Carlsberg Special listening to Absolute Classic Rock on the radio.	TV	When I eventually emerge from the bath, I go straight to the TV to see what's on. And if there's nothing worth watching, I've got plenty of DVDs to choose from.		No		No		No
13	table	bed	blender	oven	kettle	blender	Reminds me of my childhood	Bed	I feel that the day is closing and I have done all my tasks	Kettle	Means I'm having a break for a coffee	Yes		Yes		Yes	
14	kettle	broom	toaster	fridge freezer	tv	TV	It brings me entertainment and information.	Light	Because it chases the dark away and makes so much else possible.	Computer (not sure if this counts as a domestic object)	It brings me information, entertainment and communication with friends, loved ones and strangers all over the world	Yes		Yes		Yes	
15	toaster	window	kettle	broom	cat	potato masher	satisfying release of frustration	hoover	to clean up the place ans see immediate results	bottle opener	its nice to drink wine		No	Yes			No
16	kettle	stool	iron	radio	rug	radio	it's portable really simple, reminds me of my childhood, I own it and can choose how to use it.	kettle used on the hob	because it is not the electric one we also own, it is one that takes longer and that does the job effectively and simple in a way that has been used for hundreds of years.It makes me slow down.	stool	I made it. It is made of wood and seagrass and I like the natiral materials, the size, the smell of it.	Yes		Yes		Yes	
17	chair	table	light	kitchen utensils	kettle	my kettle	Because it means I am about to have a cup of tea which is a very important part of my day! And also my kettle has a cool blue light on it so I can watch the water boiling in a final glow!	my blender	Just for the sheer playfulness of being able to watch food transform into pulp (usually soup!) and to play with the 'pulse' button - childish but fun	my leather arm chair	Because it means it is the end of the day and I finally get to have a rest - very much associate this object with comfort/reassurance	Yes		Yes		Yes	
18	cafetiere	bed	duvet	pillow	teapot	bed	safe & warm & comfortable	cafetiere	good tasting drink that gives a boost	large coffee mug	it is aesthetically attractive, it holds heat and my daily caffeine.		No	Yes		Yes	
19	chair	potato peeler	pot	table	desk	a good frying pan	I like cooking, I like good tools, i like searing food over high heat	kitchen aid mixer	I love to make cakes	computer	I like to write and talk to my kids	Yes			No	Yes	
20	TV	settee	fire	computer	bed	computer	I can be in constant communication with the world	cooker	I love cooking	settee or chair	I can relax		No	Yes			No
21	Washing Machine	Freezer	Dishwasher	Tumbledryer	Breadmaker	Washing Machine	Can't do without it, as I'm discovering while mine is broken!!	Freezer	Not just the convenience of being able to buy things ahead, but it saves so much time and money being able to cook ahead or freeze organic produce that doesn't have a long shelf life	Breadmaker	Can't remember when we last bought bread - the breadmaker is constangly on the go and we know that we are eating the best ingredients with no nasty additives!		No	Yes		Yes	
22	Washing machine	Fridge	Iron	Sofa	Table	Television	Interest, relaxation, sharing with family	Computer	Fun, communication, information	Radio	Interest, entertainment, company	Yes		Yes		Yes	
23	Hoover	table	radio	roller blind	bed	iron/ironing board	it is good to get everything looking tidy and ready for use. Time to listen to radio and to think about other things	washing machine	it takes care of what used to be very hard work - can go away and leave it and come back when it is finished	oven	don't often et time to bake, but when I do it is an achievement	Yes		Yes		Yes	
24	Kettle	Microwave	Bed	Table	Sofa	Bed	It's got a great mattress	Kettle	Because after I've used it I have a nice hot coffee :)))	Bath	I usually have showers but on the rare occasions I take a bath I love just soaking there with a book, it's relaxing.	Yes		Yes		Yes	
25	hoover	iron	washing machine	dishwasher	dustpan and brush	washing machine	saves me time	hoover	it is theraputic	dustpan and brush	handy object	Yes		Yes		Yes	
26	TV	Stereo	Washing Machine	Microwave	Tumble Dryer	TV	Entertainment	Washing Machine	Ease of use	Stereo	Music		No	Yes			No
27	mug	Kettle	bed	computer	rug	Computer	mental stimulation, contact, research, study.	Global Chef's vegetable knife	an object of beauty and function	A drop arm box Ottoman (day couch)	a gift, and much used and loved	Yes		Yes		Yes	
28	kettle	cooker	fridge	iron	sink	cooker	I like to cook - it's relaxing plus its something that needs doing	iron	quite like the mindlessness of the activity in front of the TV	TV	there's always something to watch - it's relaxing		No	Yes			No
29	3-piece suite	fridge/freezer	cooker	dining table/chairs	washing machine								No	Yes			No
30	Microwave	Washing machine	cooker	iron	toaster	The microwave	Its quick and clean and convenient to do dinner for one	the toaster	I like toast !!	The washing machine	who does hand washing !!	Yes		Yes		Yes	
31	bed	kitchen table	sofa	bookcase	sleepers	bed	sleeping and resting/watching movies/reading	sofa	napping/siesta	kitchen table	eating/talking with partner/enjoying meals with friends/work	Yes		Yes		Yes	
32	kettle	washing machine	toaster	fridge	hoover	kettle	makes tea	toaster	makes toast	washing machine	clean clothes	Yes		Yes		Yes	
33	diswasher	bed	ashtrey	sofa	tv	laptop because i can play music, watch movies, speak to my family, read, learn.....	sofa because is where i relax when at home, or when someone come over.	diswasher because it does the job for me					No	Yes		Yes	
34	ferro da stiro	frigorifero	tostapane	lavastoviglie	frullatore	lavatrice	non posso lavare a mano per allergie	aspirapolvere	e' veloce	vaoporetto	risparmio sul lavaggio tappeti		No		No	Yes	
35	Iron	Washing Machine	TV	Kitchen table	Ironing board	TV	Escapism, quick way to catch up on current affairs, habit	Bed	I value my sleep. When im not sleeping, simply sitting on it with a book is relaxing	Sewing Machine	It allows me to be creative. I can only use it when I have spare time so it also feels rewarding.	Yes		Yes		Yes	
36	vacuum cleaner	washing machine	food blender	bed	chair	food blender	love making soup	bed	because it is comfy and warm	cooker	love cooking and it makes life so much easier		No	Yes		Yes	
37	ketle	caffeteria	mug	glass	lamp	Ketle	The smell from the tea and the warmness gives me sence to be cozy and in peace at home	Caffeteria	I also love the smell of coffee. I cannot go to work without drink it. It is energetic and wake up my sences to start a new day with renewed energy	glass	If is a glass of wine brings me the feeling another day had finish, I did what I was set up to do. I have been faithfull to my duty.		No	Yes		Yes	
38	coffee pot	water bottle	sofa	tv	pc	Coffee pot	Daily ritual	Swiss Army knife	it's small but of great use to craft things	iPod	I can easily bring music around the house	Yes		Yes		Yes	
39	Mobile phone	Computer	Table lamp	Coffee Maker	Kettle	Computer.	It's my main creative tool of work.	Coffee maker- French press and Moka-	I love drinking espresso while I work, and I really like the designs.	Mobile phone.	Because connects me to the world.	Yes		Yes		Yes	
40	Sofa	Table	Chair	Bed	Cooker	Sofa	One can sleep on it	Cooker	I like cooking	Bed	One can sleep on it	Yes			No	Yes	
41	cofee table																
42	Coffee table	Sofa	TV-computer	Bed	Book case	sofa, book case, computer	I can sit, rest, read and work on it if I want	It is fairly comfortable and it is in a room full of light	It has all my books and I like the way it looks, messy but ME	It is practical and beautifully made	Very practical for work, studying and networking. I also keep in touch with friends from far away!	Yes		Yes		Yes	
43	Kettle	Toaster	Iron	Washing Machine	Oven	Oven	Love cooking	Fridge freezer	Its brand new and my dream fridge!	kettle	Nothing beats a cup of tea!	Yes			No	Yes	
44	Vacuume cleaner	Washing Machine	Iron	TV	Computer	Computer	Helps with work and studying (Couldn't imagine hand writting everything!!)	Iron	Makes the clothes we buy look smart	Vacuume cleaner	Smartens my home and means I can have carpets easily.	Yes			No	Yes	
45	washer	hoover	iron	cooker	kettle	kettle	shove it all in and its done in half an hour	kettle	quick and easy	iron	like to listern to my music while i iron	Yes			No	Yes	
46	whisk	dishes	chair	bed	coffee machine	coffee or tea machine	because I like hot beverages	toilet	because that in my house is the only one that make me feel comfortable	kitchen table	because it's perfect for any use	Yes		Yes		Yes	
47	lamp	desk	rug	kettle	chair	TV	to watch films	Washing machine	I like clean clothes	Blender	I love soup	Yes		Yes		Yes	
48	Laptop	Refrigerator	Toilet bowl	bed	table	Laptop	Makes work more efficient, main tool for getting information and helps me keep in touch with friends	bed	really good for resting	tv	getting information about politics	Yes			No	Yes	
49	lamp	table	fridge	waching machine	bed	toilet	meditative and contemplative	computer	center of entertainment	tweezers	they solve a lot of problems	Yes			No	Yes	
50	plate	glass	washingmaschine	table	sofa	computer	I can be connected whit my friends	shower	it relax and it cleans	mirror	it help me wenn I try to have a good style	Yes			No	Yes	
51	house key	fridge	pillow	slipper	toaster	fridge	I love eat	pillow	I love sleep	toaster	I love to eat warm bread	Yes			No	Yes	
52	cup	spoon	plate	hair brush	chair	wooden spoon	Steering i like know that you have made a good start at the dinner	sofa	Know that i only have have time to rest	Mug	need to be a good looking one	Yes		Yes		Yes	
53	Blender	Pot	Pan	Toaster	Broom	Hot water boiler	Morning coffee, french press	Barbeque	Love to barbeque	Hand held blender	smoothies and every thing in a jiffy	Yes			No	Yes	
54	mixer	lamp	microwave oven	phon	lighter		because i love milkshakes	microwave oven	because it is easy and fast to cook with it		because i smoke	Yes			No	Yes	
55	refrigerator	end table	comforter	spatula	garden hose	old beat up teflon - coated frying pan	It beats all the newer ones and is especially good for frying eggs.	hand garden clippers	love to trim bushes and plantings with them	desk chair pad	makes sitting at my desk/computer more comfortable	Yes		Yes		Yes	
56	decanter	tv	cat	phone	computer	tv	good relaxation tool	cat	good food	decanter	enjoy the wine better	Yes		Yes		Yes	
57	Washing machine	Blender	Dishwasher	Phone	Radiator	Washing machine	Does a lot of hard work	Dishwasher	Keep everything tidy and does a lot of work	Tele		Yes		Yes		Yes	
58	notebook	washing-machine	coffee maker	microwave oven	TV	toothbrush	When I use it in the mornings, it helps to wake up	gas-oven	for making a chiken meal	desk lamp	for reading a book	Yes		Yes		Yes	
59	Broom	Hoover/vacumn	Mop	TV	Fridge	Phone	Small, connects to outside of home, provides communication	Record player	Better quality of music	Saucepan	Enjoy cooking and providing for family and friends		No	Yes			No
60	Bed	Oven	Toilet	Shower	Table	Mug	Obvious reasons, sleeping and seXx	Mug	Feels comforting when using it	Oven	Enjoy baking and making food for family	Yes		Yes		Yes	
61	sofa	blanket	rug	table	tea cup	1930's family crystal champagne glasses	they are special	cuisinart automatic grind and brew coffee pot	closest thing to a robotic butler in my life	dining room table	it is nice to spend time around a table eating and talking	Yes			No	Yes	
62	iron	table	chair	toothbrush	cleaner	couch	tired	kettle	making tea	toaster	toast bagel	Yes			No	Yes	
63	bed	curtains	sink	broom	washing machine	bed	comfortable. sleep is good	my throw cushions	pretty	desktop computer	it does everything. friends, work, news, entertainment....	Yes			No	Yes	
64	boiler	toaster	pillow	feeding chair	computer	computer		kitchen tools	good food	bed	rest	Yes			No	Yes	
65	dishwasher	refrigerator	washing machine	mixer	microwave	dishwasher	for ecological reasons	washing machine	for ecological reasons	microwav	for practical reasons	Yes			No	Yes	
66	LCD TV	Espresso Machine	Ham Slicer	Bed	Sofa	LCD TV	It works as screen for all media devices	Tempur Bed	I love to sleep in it	Espresso Machine	I need espresso in the morning	Yes			No	Yes	
67	chair	table	stool	bookcase	dresser	armchair	because I am a sedentary person and enjoy reading, watching tv, doing handwork, working at computer, etc.	table	because I like spreading papers out and doing drawing or other activities with my grandchildren.	bookcase	because I own a lot of books and I like them to be housed conveniently and accessibly.	Yes			No	Yes	
68	kettle	kitchen table	trash can	couch	pots and pans	kettle	making tea	couch	sitting and spending time with family/friends	kitchen table	it's where everyone ends up spending a lot of time	Yes			No	Yes	
69	computer	TV	cook	refrigerator	microwave	computer	entertaining,informative,useful,multifunctional	cook	I like cooking and also eating	stereo	enjoy listening to music eventhough computer often replaces it	Yes			No	Yes	
70	Chair	Bed	Lamp	Table	Dishes	Bed	for recreation of any sort	Beautiful objects such as paintings, taxidermy, skeleton, flowers, plants	They give visual pleasure - sometime also tactile pleasure	Lamps	Lighting creates different atmospheres for different moods	Yes			No	Yes	
71	Kettle	Bed	Toilet	Plate	Sofa	Sofa	Relaxation	Drinking glass	A necessity - rarely more than a foot away from one.	TV	Mental stimulation	Yes		Yes		Yes	
72	table	spoons	oven	cooker	washing machine							Yes		Yes		Yes	

Appendix 9: IMDb forum post and answer breakdown

Appendix 9 IMDb forum post and answer breakdown

Request Post

POSTED ON IMDB Mon 16th July 2012, at 17.20

SUBJECT: recommendations please: movies featuring prominent objects

I'm working on a project about objects in films and I need some recommendations of films that feature one or more of the following objects prominently:

sofa

kettle

toaster

table

iron

coffee-maker

cup

blender

If possible the films should be fictional narrative films and should be from between 1997 and 2012.

Any recommendations very welcome! Thank you!

PS. as this is part of research for University I am required to tell you that I won't steal your email address. You can find my privacy policy here: http://silvia.myblog.arts.ac.uk/2012/07/16/privacy-policy/

PPS. this is my first post on here - please be kind.

Answers Analysis

Each answer to the forum post was categorised by object and the film year and genre were noted. The films that qualified by date, were then watched to identify the relevant scenes and whether there was enough material to work with from the scenes. Of all the films that had enough materials, four sample films were selected for each object with varied genres, as well as a varied role that the object performs.

Object	Film title	year	genre (from IMDB)
blender	Gremlins	1984	comedy; fantasy; horror
blender	The Neverending Story	1984	adventure; drama; family
blender	Bridget Jones' Diary	2001	comedy; drama; romance
blender	Kill Bill 2	2004	crime; drama; thriller
blender	Mask	1985	comedy; drama
coffee-maker	The Life Aquatic With Steve Zissou	2004	adventure; comedy; drama
coffee-maker	Mulholland Drive	2001	drama; mystery; thriller
coffee-maker	21 Grams	2003	crime; drama; thriller
coffee-maker	The Green Hornet	2011	action; comedy; crime
coffee-maker	Stranger Thank Fiction	2006	comedy; drama; fantasy
coffee-maker	Employee of the Month	2006	comedy; romance
coffee-maker	The Ipcress File	1965	crime; mystery; thriller
cup	Mulholland Drive	2001	drama; mystery; thriller
cup	Pulp Fiction	1994	crime; thriller
cup	The Usual Suspects	1995	crime; drama; mystery
cup	Beauty and the Beast	1991	animation; family; fantasy
cup	I, Robot	2004	action; mystery; sci-fi
iron	Home Alone	1990	adventure; comedy; family
iron (toaster?)	Benny and Joon	1993	comedy; drama; romance
kettle	A Tale of Two Sisters	2003	drama; horror; mystery
kettle	Final Destination 2	2003	horror; thriller
kettle	Secretary	2002	comedy; drama; romance
kettle	Wristcutters: A Love Story	2006	comedy; drama; fantasy
multiple	Everything Must Go	2010	comedy; drama
multiple	Kitchen Stories	2003	comedy; drama
multiple kitchen appliances	Hardware Wars	1978	action; comedy; sci-fi
multiple kitchen appliances	No Reservations	2007	comedy; drama; romance
multiple: kettle; cup; possibly iron	Vera Drake	2004	crime; drama
multiple: sofa; table	Cherish	2002	comedy; drama; thriller
sofa	Scary Movie	2000	comedy

sofa	Betty Blue	1986	drama; romance
sofa	A Couch in New York	1996	comedy; romance
sofa	Scary Movie 4	2006	comedy
sofa	Ghostbusters	1984	comedy; fantasy
sofa	Paperman	2012	animation; short
sofa	Honey I Shrunk the Kids	1989	adventure; comedy; family
sofa	Fish Tank	2009	drama
sofa	25th hour	2002	crime; drama
table	The Future	2011	comedy; drama
table	Eternal Sunshine of the Spotless Mind	2004	drama; romance; sci-fi
table	The Woodsman	2004	drama
table	Dark City	1998	mystery; sci-fi; thriller
table	Assassins	1995	action; thriller; crime
table	Batman Returns	1992	action; crime; fantasy
table	Tommy Boy	1995	comedy
table (coffee-table)	Cold Weather	2010	comedy; drama; mystery
toaster	The Brave Little Toaster	1987	animation; adventure; comedy
toaster	Ghostbusters II	1989	action; adventure; comedy
toaster	Groundhog Day	1993	comedy; drama; fantasy
toaster	Brazil	1985	drama; fantasy; sci-fi
toaster	True West	2002	drama

| Object	Film title	year	genre (from IMDB)	scene	notes	source
blender	Gremlins	1984	comedy; fantasy; horror	youtube.com/watch?v=PIrd4172Czw		multiple: IMDB forum(x2); facebook group (x2)
blender	The Neverending Story	1984	adventure; drama; family	opening kitchen scene	The Neverending Story (opening kitchen scene) i1108.photobucket.com/albums/h411/eroock/assorted/The-Neverending-Stor y-blender.jpg	IMDB forum
blender	Bridget Jones' Diary	2001	comedy; drama; romance		In Bridget Jones' Diary,(2001) Bridget sprays the contents of the blender all over herself	IMDB forum
blender	Kill Bill 2	2004	crime; drama; thriller		Kill Bill 2 (mark 01:03:25) i1108.photobucket.com/albums/h411/eroock/assorted/kill_bill_2_blender. jpg	IMDB forum
blender	Mask	1985	comedy; drama	http://www.youtube.com/watch?v=CZhNP08KYn 4#t=95s		IMDB forum
coffee-maker	The Life Aquatic With Steve Zissou	2004	adventure; comedy; drama	scene where Bill Murray's crew steals Jeff Goldblum's coffee machine; later Goldblum encounters it on Murray's boat	The Life Aquatic With Steve Zissou features a scene where Bill Murray's crew steals Jeff Goldblum's coffee machine; later Goldblum encounters it on Murray's boat.	IMDB forum
coffee-maker	Mulholland Drive	2001	drama; mystery; thriller			IMDB forum
coffee-maker	21 Grams	2003	crime; drama; thriller			IMDB forum
coffee-maker	The Green Hornet	2011	action; comedy; crime		"the green hornet" had a coffee maker	IMDB forum
coffee-maker	Stranger Thank Fiction	2006	comedy; drama; fantasy		i1108.photobucket.com/albums/h411/eroock/assorted/Stranger-Than-Fiction_coffeemaker.jpg	IMDB forum
coffee-maker	Employee of the Month	2006	comedy; romance		Employee of the Month. Dane Cook's character starts off mornings at the coffee maker.	IMDB forum
coffee-maker	The Ipcress File	1965	crime; mystery; thriller	youtube.com/watch?v=pBCqP7R42K0	youtube.com/watch?v=pBCqP7R42K0	IMDB forum
cup	Mulholland Drive	2001	drama; mystery; thriller	youtube.com/watch?v=1g4V55DSrbg		IMDB forum
cup	Pulp Fiction	1994	crime; thriller	Pulp Fiction youtube.com/watch?v=0QGnWnFWoxA		IMDB forum
cup	The Usual Suspects	1995	crime; drama; mystery		- The Usual Suspects (1995) - broken coffee-cup, "Kobayashi Porcelain"	IMDB forum
cup	Beauty and the Beast	1991	animation; family; fantasy		- Beauty And The Beast (1991) - one of the supporting characters is a tea-cup.	IMDB forum
cup	I, Robot	2004	action; mystery; sci-fi		- I Robot - if I remember correctly, in one scene Will Smith is stirring ostentatiously in a cup of coffee in Bruce Greenwood's office.	IMDB forum
iron	Home Alone	1990	adventure; comedy; family		"home alone" had a thief catch an iron with his face	IMDB forum
iron (toaster?)	Benny and Joon	1993	comedy; drama; romance		Toaster: who needs a toaster if you already have that^ ! ;o)	IMDB forum
kettle	A Tale of Two Sisters	2003	drama; horror; mystery	youtube.com/watch?v=QIccKouyJSU#t=5173s	A Tale of Two Sisters youtube.com/watch?v=QIccKouyJSU#t=5173s	IMDB forum
kettle	Final Destination 2	2003	horror; thriller		one of the "final destination" films, maybe #3, had a whistling kettle	IMDB forum (x2)
kettle	Secretary	2002	comedy; drama; romance		I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)	IMDB forum
kettle	Wristcutters: A Love Story	2006	comedy; drama; fantasy	youtube.com/watch?v=tM6O_lvVGHY#t=290s		IMDB forum
multiple	Everything Must Go	2010	comedy; drama		Everything Must Go has a lot of those objects. Will Farrell's character seems attached to them.	IMDB forum
multiple	Kitchen Stories	2003	comedy; drama		You might want to look into Kitchen Stories (2003), although I haven't seen it myself.	IMDB forum
multiple kitchen appliances	Hardware Wars	1978	action; comedy; sci-fi		"Hardware Wars"-a short that spoofs Star Wars but with kitchen appliances. Should still be out there somewhere.	IMDB forum
multiple kitchen appliances	No Reservations	2007	comedy; drama; romance		"no reservations" had all sorts of kitchen stuff	IMDB forum
multiple: kettle; cup; possibly iron	Vera Drake	2004	crime; drama		In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)There may be an iron too, as I remember her taking in laundry from rich people, but can't think of a specific scene.	IMDB forum
multiple: sofa; table	Cherish	2002	comedy; drama; thriller		The film "Cherish" (2002), starring Robin Tunney, is about a woman placed under house arrest in a big, open loft apartment; it highly features a bright orange sofa and a small square table with two wooden chairs.	IMDB forum
sofa	Scary Movie	2000	comedy	movieclips.com/QXLh-scary-movie-movie-do-you-know-where-i-am/		IMDB forum
sofa	Betty Blue	1986	drama; romance		sofa: Betty Blue youtube.com/watch?v=MbRDJ3P9zZ8#t=4235s very graphic frontal nudity, so probably not suitable	IMDB forum
sofa	A Couch in New York	1996	comedy; romance			IMDB forum
sofa	Scary Movie 4	2006	comedy		Scary Movie 4 - Tom Ryan & Oprah scene	IMDB forum
sofa	Ghostbusters	1984	comedy; fantasy		Ghostbuster youtube.com/watch?t=37s	IMDB forum
sofa	Paperman	2012	animation; short		There is a fairly prominent sofa in Paperman.	IMDB forum
sofa	Honey I Shrunk the Kids	1989	adventure; comedy; family		In "Honey I Shrunk the Kids", the first thing Wayne Szalinski's machine shrinks is the couch/sofa in his workshop. Later, he steps on it (it's pretty tiny!), picks it up and realizes just what he's looking at. THEN he realizes that the machine must have shrunk his kids, so the couch plays quite an important role :)	IMDB forum
sofa	Fish Tank	2009	drama		In Fish Tank (2009) the first time Connor and Mia have sex is on the living room couch.	IMDB forum
sofa	25th hour	2002	crime; drama	youtube.com/watch?v=xEw9subI6TY#t=1668s		IMDB forum
table	The Future	2011	comedy; drama	http://www.nowness.com/day/2011/7/26/1533/miranda-july-the-future		IMDB forum
table	Eternal Sunshine of the Spotless Mind	2004	drama; romance; sci-fi	There's an elaborate scene in Eternal Sunshine Of The Spotless Mind where Jim Carrey is "hiding" under the kitchen table and Kate Winslet is talking to him.	There's an elaborate scene in Eternal Sunshine Of The Spotless Mind where Jim Carrey is "hiding" under the kitchen table and Kate Winslet is talking to him.	IMDB forum
table	The Woodsman	2004	drama	The Woodsman youtube.com/watch?v=ne7s0fFDxnQ#t=121s (they come back to it in a later scene)	The Woodsman youtube.com/watch?v=ne7s0fFDxnQ#t=121s (they come back to it in a later scene)	IMDB forum
table	Dark City	1998	mystery; sci-fi; thriller	youtube.com/watch?v=pF0GOo-LSZ4#t=480s	Dark City (Morphing) youtube.com/watch?v=pF0GOo-LSZ4#t=480s	IMDB forum
table	Assassins	1995	action; thriller; crime		- There are probably many movies in which a main character uses a table on its side as cover against either gunfire or an explosion; e.g. in Assassins (1995), if memory serves me correctly.	IMDB forum
table	Batman Returns	1992	action; crime; fantasy			IMDB forum
table	Tommy Boy	1995	comedy		Tommy Boy. Chris Farley's character passes out and falls on and crushes a coffee table.	IMDB forum
table (coffee-table)	Cold Weather	2010	comedy; drama; mystery		Cold Weather (2011) - coffee table	IMDB forum
toaster	The Brave Little Toaster	1987	animation; adventure; comedy		Also, the Brave Little Toaster (there are sequals in IMDB, just type in the name in the search box to see.)	multiple: IMDB forum; facebook group
toaster	Ghostbusters II	1989	action; adventure; comedy	http://www.youtube.com/watch?v=1vYRyqMw9y E		multiple: IMDB forum; facebook group(x3)
toaster	Groundhog Day	1993	comedy; drama; fantasy	youtube.com/watch?v=lGSPVWa9MoY		IMDB forum
toaster	Brazil	1985	drama; fantasy; sci-fi		Brazil youtube.com/watch?v=guzbb3IZyt0 (short scene early on) i1108.photobucket.com/albums/h411/eroock/assorted/brazil-toaster.jpg	IMDB forum
toaster	True West	2002	drama		one of the brothers steals toasters	IMDB forum

Appendix 10: Analysis of the four kettle scenes

Title: Secretary

Scene: 7.02 to 8.22 min

Object: kettle

Year: 2002

Genre: comedy, drama, romance

Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

Title: Secretary

Scene: 7.02 to 8.22 min

Object: kettle

Year: 2002

Genre: comedy, drama, romance

Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10

10

10

5

5

15

25

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved

Title: Secretary

Scene: 7.02 to 8.22 min

Object: kettle

Year: 2002

Genre: comedy, drama, romance

Source: IMDB forum

Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"

10   10   10   5   5   15   25

value: sanity : charge

character's emotional charge

viewer's empathy : story charge

Protagonist is calmly making tea.

Protagonist is distressed by hearing her parents fight

Protagonist peeks into other room to see what is happening

Father angrily pushes mother to the floor

Protagonist is shocked and goes to get kettle

Protagonist grabs kettle and slowly carries it upstairs while father walks away ranting and mother gets up

Protagonist burns herself with the kettle and feels relieved

role of the object:
metaphorical: represents domesticity, calm, normalcy

role of the object:
catalyst for action: it's an available weapon, ready to be used

Title: Secretary Scene: 7.02 to 8.22 min Object: kettle	Year: 2002 Genre: comedy, drama, romance Source: IMDB forum	Notes: "I immediately thought of the scene in Secretary (2002) where Maggie Gyllenhaal's character engages in self-harm by holding a boiling kettle against her leg(!)"
Conflict: to keep some semblance of normalcy within situation Objective: keep sane - not hurt herself	Who: protagonist Antagonist: father's alcoholism	Context of film: protagonist is a self harmer who just left a mental hospital. She returns into the same domestic problems: alcoholic father, the rest of the family is in denial

Possible briefs from this film:

- 10|10|10|5|5|15|25 as an organisational principle for micro-events within a single interaction (timing structure)
- alternation of value charges - with or without the timing - within a single interaction (value structure)
- change of the role of the object: from metaphorical to catalyst for action
- change of the role of the object from one of calming and domestic to a weapon for self harm
- role reversals in general

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

Title: Vera Drake

Scenes: 2.00 min; 21 min; 30 min; 45 min

Object: kettle

Year: 2004

Genre: crime, drama

Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

Title: Vera Drake

Scenes: 2.00 min; 21 min; 30 min; 45 min

Object: kettle

Year: 2004

Genre: crime, drama

Source: IMDB forum

min 2

min 21

min 30

min 45

Kettle to make tea for ill old man

Kettle for young girl's abortion

Kettle for abortion for mother of lots

Kettle for abortion for frightened girl

Title: Vera Drake

Scenes: 2.00 min; 21 min; 30 min; 45 min

Object: kettle

Year: 2004

Genre: crime, drama

Source: IMDB forum

Notes: "In Vera Drake, (2004) Vera is always putting the kettle on to have a cuppa, so there are lots of teacups, too! :)"

min 2

min 21

min 30

min 45

value: caring - charge

54 last abortion, hospital

1.05 police arrive

1.20 police questioning "did it happen to you?"

1.50 court defense (caring)

Kettle to make tea for ill old man

Kettle for young girl's abortion

Kettle for abortion for mother of lots

Kettle for abortion for frightened girl

role of the object:
establishing character, and acts, as caring/helping

Title: Vera Drake

Scenes: 2.00 min; 21 min; 30 min; 45 min

Object: kettle

Year: 2004

Genre: crime, drama

Source: IMDB forum

Conflict: contast between helping people by visiting and making tea and helping people by performing illegal abortions

Objective: to help people, to care for people

Who: protagonist

Antagonist: morals? society, law

Context of film: Vera Drake is well known in her neighbourhood as someone who is always ready to help people in trouble, ill, etc. She also helps women by performing illegal abortions. In both she goes in, uses kettle, leaves.

Possible briefs from this film:

- a device for framing an act as a caring act
- a device for establishing a person's character as a caring one
- domestic object used to do the opposite of "domestic"
- constrast with the teapot - kettle is definitely a utilitarian object, a means to an end. The teapot is very different in the film.
- Kettle is somewhat dangerous - it's picked up with a cloth in the first scene, it is concealed from the husband in the third scene.

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

- kettle stays in the frame a lot - scene 2 and scene 4 especially, where it is the last thing to disappear from the environments

Title: Wristcutters: A Love Story

Scene: min 0 to 6.16 (kettle at 4.55)

Object: kettle

Year: 2006

Genre: comedy, drama, fantasy

Source: IMDB forum

Notes: none

Title: Wristcutters: A Love Story

Scene: min 0 to 6.16 (kettle at 4.55)

Object: kettle

Year: 2006

Genre: comedy, drama, fantasy

Source: IMDB forum

Notes: none

40

160

visual effects supervisor
CHRIS DAWSON

70

40

10

40

titles

Protagonist gets up, puts on music, cleans the house

Protagonist commits suicide in nice flat bathroom

Protagonist imagines what his girlfriend is doing

Kettle whistles

Cut to protagonist in gray world squallid toilet

96

Title: Wristcutters: A Love Story

Scene: min 0 to 6.16 (kettle at 4.55)

Object: kettle

Year: 2006

Genre: comedy, drama, fantasy

Source: IMDB forum

Notes: none

40

160

70

40

10

40

value: depression

titles

Protagonist gets up, puts on music, cleans the house

Protagonist commits suicide in nice flat bathroom

Protagonist imagines what his girlfriend is doing

Kettle whistles

Cut to protagonist in gray world squallid toilet

role of the object:

metaphorical: represents domesticity, settling down, consoling | device for moving out of the scene into another world

97

Title: Wristcutters: A Love Story Scene: min 0 to 6.16 (kettle at 4.55) Object: kettle	Year: 2006 Genre: comedy, drama, fantasy Source: IMDB forum	Notes: none
Conflict: depression Objective: to feel better?	Who: protagonist Antagonist: fictional lover?	Context of film: protagonist commits suicide by cutting his wrists in the initial scene. He then imagines what happened to his girlfriend after he died.

Possible briefs from this film: - kettle as a device to switch between worlds. Or kettle whistle. - kettle comes into the imagination of the protagonist to represent that the other man has got her. Possession in a sequal and relationship way - represents cosyness and normalcy (in contrast to the next scene in the "other world"	Possible briefs from comparing films: - kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast") - comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.	Notes:

Title: Tale of Two Sisters

Scene: 1.18 to 1.24

Object: kettle

Year: 2003

Genre: drama, horror, mystery

Source: IMDB forum

Notes: none

Title: Tale of Two Sisters

Scene: 1.18 to 1.24

Object: kettle

Year: 2003

Genre: drama, horror, mystery

Source: IMDB forum

Notes: none

120

50

10

5

10

5

30

25

5

30

5

10

10

5

15

15

10

10

Protagonist follows a trail of blood through the house

Finds a bloody sack, tries to open it but can't

rummages in drawer

kettle whistles

stepmother

kettle again

flashbacks

sack's not there - she follows trail of blood

stepmother

She finds sack in closet

kettle whistles

stepmother wipes hands

stepmother carries kettle

she cuts sack

confrontation with kettle

kettle thrown - stabs with scissors

fight

end on floor

Title: Tale of Two Sisters

Scene: 1.18 to 1.24

Object: kettle

Year: 2003

Genre: drama, horror, mystery

Source: IMDB forum

Notes: none

120

50

10 5 10 5

30

25 5

30

5

10 10 5 15

15 10 10

value: sanity - charge

value: urgent fear (character's)

viewer's understanding of story

Protagonist follows a trail of blood through the house

Finds a bloody sack, tries to open it but can't

rummages in drawer

kettle whistles

stepmother

kettle again

flashbacks

sack's not there - she follows trail of blood

stepmother

She finds sack in closet

kettle whistles

stepmother wipes hands

stepmother carries kettle

she cuts sack

confrontation with kettle

kettle thrown - stabs with scissors

fight

end on floor

role of the object:

catalyst for action: it's an available weapon, ready to be used | metaphorical: out of place in setting; whistle for danger, madness

101

Title: Tale of Two Sisters Scene: 1.18 to 1.24 Object: kettle	Year: 2003 Genre: drama, horror, mystery Source: IMDB forum	Notes: none
Conflict: to understand what is going on | protect her sister Objective: save her sister | regain sanity	Who: protagonist Antagonist: stepmother	Context of film: protagonist leaves a mental hopital after the death of her mother to return to a house that is haunted and a strange/evil stepmother.

Possible briefs from this film:

- fast pace, quick cuts (timing structure).
- alternation of value charges - with or without the timing - within a single interaction (value structure).
- not quite understanding what is going on but getting glimpses.
- object that appears out of place also acts out of place.
- the whistle as related to/causing madness or visions.

Possible briefs from comparing films:

- kettle as a representation of calm, domesticity, normalcy, care (how the kettle is "cast")
- comparison metween kettle roles in films analysed: Secretary: sanity, domesticity, vs weapon, dangerous; Vera Drake: a device for framing an act as a caring act (ambiguous caring); Wristcutters: focus on kettle whistle as a device to switch scenes.

Notes:

Appendix 11: Three storyboards from participant interviews

Appendix 12: Design Process Matrix

DEFINITIONS:

D1: Minimal · events · representation · D2: Sequenced · structured progr · chronology · charact/entity · D3: Logically Sequenced · cause/effect · agency · D4: Value laden · affect · value · D5: Entertainment · conflict · climax · change · coherence · equilibrium · closure · not fully predict. · hero · antagonist · motivation

TYPOLOGY:

1.1 activates stories (associated or remembered) · 1.2 facilitates story imagining · 2.1 research tool · 2.2 analysis or idea generation tool · 3.1 accompanying external narrative · 3.2 structures user experience as narrative

NARRATIVE FUNCTIONS:

1: convey information · 2: evoke reflectivity · 3: show/teach values · 4: empathy and identification · 5: imagination and creativity · 6: increase memorability · 7: delighting · 8: persuading (incl. lying) · 9: cohesion and comprehension

MICRO-EVENTS:

- see kettle
- lift off base
- carry to sink
- open top
- limescale inspection
- empty out water
- rinse out
- fill kettle
- fill from lid
- fill from top
- close top
- carry to base
- replace on base
- turn on
- turn on repeatedly/double check
- observe light change
- wait for boil
- do something else
- check on kettle
- boil
- click
- steam
- noise
- whistle
- run to kettle
- turn off
- lift kettle off base
- pour water
- replace onto base

DEFINITIONS:

- D1: Minimal
- events
- representation
- D2: Sequenced
- structured progr
- chronology
- charact/ entity
- D3: Logically Sequenced
- cause/effect
- agency
- D4: Value laden
- affect
- value
- D5: Entertainment
- conflict
- climax
- change
- coherence
- equilibrium
- closure
- not fully predict.
- hero
- antagonist
- motivation

TYPOLOGY:

- 1.1 activates stories (associated or remembered)
- 1.2 facilitates story imagining
- 2.1 research tool
- 2.2 analysis or idea generation tool
- 3.1 accompanying external narrative
- 3.2 structures user experience as narrative

NARRATIVE FUNCTIONS:

- 1: convey information
- 2: evoke reflectivity
- 3: show/teach values
- 4: empathy and identification
- 5: imagination and creativity
- 6: increase memorability
- 7: delighting
- 8: persuading (incl. lying)
- 9: cohesion and comprehension

MICRO-EVENTS:

- see kettle
- lift off base
- carry to sink
- open top
- limescale inspection
- empty out water
- rinse out
- fill kettle
- fill from lid
- fill from top
- close top
- carry to base
- replace on base
- turn on
- turn on repeatedly/ double check
- observe light change
- wait for boil
- do something else
- check on kettle
- boil
- click
- steam
- noise
- whistle
- run to kettle
- turn off
- lift kettle off base
- pour water
- replace onto base

Appendix 13: Grimaldi, S. (2017) 'Surprising Longevity', in Chapman, J. (ed.) *The Routledge Handbook of Sustainable Product Design*. **Routledge/Taylor & Francis.**

Final edit of: Grimaldi, S. 2017, Surprising Longevity. in Chapman, J. ed. *The Routledge Handbook of Sustainable Product Design*. Routledge

[P298 - 315]

20 Surprising Longevity

Silvia Grimaldi

Abstract

In everyday language a surprise is a sudden or unexpected event; psychologically though, the emotions of surprise is the reaction to the sudden or unexpected event. Surprise is one of the six primary emotions and it heightens attention to prepare us to react. If the surprise happens to be a positive one, then that positive emotion will also be heightened by the surprise and the surprise will make the event more memorable. The way we interpret the world is tied to narrative; we not only remember and recall events as stories, but we interpret them as stories as they are happening. In a similar way, product experiences have a narrative element because the series of events that make up the experience happen in time, and narrative helps us to make sense of time. Adding a surprise to a product experience creates a timeline of before and after the surprising event, and this can help to structure the experience as a story in our mind. In addition this story is emotionally charged because of the surprise, so it will stay with us longer, and the object itself will evoke that emotion and that narrative, and it will be an object we become more attached to and are less likely to prematurely dispose of. Analysis of design examples help to show how this works from a user perspective, and a design technique to incorporate meaningful surprises into the product experience is described. The chapter concludes by showing how surprise, when designed into the product experience, can contribute to the longevity of a product.

Keywords: surprise, product experience, emotional design, narrative, experience design

Introduction

Recently, people have been looking at their passports more closely, and being surprised by what they find. In particular Norwegians, Canadians and Finns have been debating online which passport is the most interesting. When looked at under black light (ultraviolet or infrared, invisible to the eye) the Canadian passport illuminates with additional images to complete the printed scenes. The Finnish passport when used as a flipbook shows an animation of a walking moose. The Norwegian passport has been the subject of a competitions held by the National Police Directorate of Norway for its redesign. The winning sketches by *Neue Design Studio* feature landscapes that come alive with scenes of the northern lights when when black light shines upon the pages.

Figure 1: Finnish Passport design sketches from the competition held by the National Police Directorate of Norway, designed by Neue Design Studio. Design sketches will not be identical to the final issued passports

Why is this surprising? Hardly anyone would look at their passports as examples of interesting design, as it is mostly a dry and somewhat bureaucratic document. However, a lot of technology and research goes into producing passports, making them harder to counterfeit. Gorgeous, romantic images of the northern lights are not what you expect to see in a passport. But it does make sense, from a cultural point of view, as the northern lights are a famous feature of the natural landscape of the country, and from a technical point of view, as black light is often used to add a layer of security to passports. Perhaps more importantly, though, is the poetic meaning; one reason why this is so striking, is that the northern lights glow when

the passport is in the dark of a black light echoing the way they glow in the dark sky. In a similar way one of the pages of the Canadian passport illuminates with fireworks in the sky of the printed scene. A black light logo would have done the job, but it wouldn't have been as surprising or as memorable. The relevance of the design adds to the surprise and sustains the sense of wonder through time.

What is surprise?

Everyone has been surprised before. In common language, surprise is a sudden or unexpected event. This event will be different than what we thought was likely to occur, or what we assumed would occur. A surprise changes the story of what we had assumed would happen and replaces it with another one with a different, unexpected ending.

If surprise is something that is unexpected it is inevitably dependant on people's expectations, which themselves are based on our experience of the world. By having seen and used a lot of mugs I can expect a mug to look like a cylinder with a loop on one side. I know it can contain a liquid, and the loop/handle can be used to grip the mug with. I know I can expect it to be hot because I have used it to contain hot liquids before. I know it is usually made of ceramic, and I know its approximate weight. I know my experience of the object will probably include filling it with a hot liquid, gripping the handle, and drinking from it, putting it back down on the table, etc. Even for an object as simple as a mug, or perhaps because it is such a simple object, this list of expectations could go on and on. These expectations and affordances allow us to approach an object that we have never seen before (a particular mug) and be able to know what its function is, how to use it, whether caution is necessary when approaching the object, etc.

Clues or signs, being based on past experiences, are necessarily dependant on the cultural context of the user. Some signs can be considered more universal (though none can be considered completely universal) like the signs that tell the user what material the object is made of. Nevertheless most signs are culturally specific, especially when we analyse their interpretation, for example what the material represents (e.g. white ceramic – sanitation). It is therefore virtually impossible to think of a universal surprise. If surprise is based on breaking, or disrupting people's expectations, it is necessary to have an audience whose expectations are more or less the same in order to surprise them all. However, the feeling of surprise is universal, and all humans feel this emotion regardless of their cultural predisposition.

The psychology of surprise – can a sudden emotion create longevity of experience?

Psychologists define surprise as part of the set of six basic human emotions, based on the standard set of emotions first compiled by P. Ekman (2014). These are surprise, joy, sadness, disgust, fear and anger (Ekman, 2014). These 6 emotions are defined as 'basic', 'universal' or 'primary', because they are the ones that we learn earlier in life and the ones that are also common to most mammals; and from these all other emotions are made to derive (Desmet, 2004).

The first scientist to catalogue human emotions was Darwin, who places surprise in a scale that goes from attention to surprise to astonishment and amazement, and talks about these emotions as closely related to the category whose scale goes from fear to horror. Both of these categories of emotions are a 'response to a sudden stimulus'. In the second scale, the fear to horror one, the stimulus is obviously a negative one that might threaten your existence; in the first scale, which includes surprise, the stimulus is unknown, and the reactions described by Darwin are all geared towards heightening the person's attention (e.g. eyes wide open) and preparing the body for a reaction (e.g. tense muscles). Because the stimulus of surprise is unknown, the body prepares itself to be able to best deal with what is coming. In this way, surprised people are more receptive to noticing things and have an enhanced perception of what is around them (Darwin, 1998).

Antonio Damasio is a neurologist who pioneered the study of emotion and human consciousness by studying patients with brain damage. He has shown that emotions are necessary to run a regular life and have particular implications for decision-making. Individuals who have brain damage in areas of the brain related to emotions seem unable to make 'rational decisions' and will make 'personal and social decisions [that] are irrational, more often disadvantageous to their selves and to others than not.' (Damasio, 2000, p40). Technically speaking, emotions are chemical and neural responses to stimuli from the outside or from memory, and they have a regulatory function within the body, which has a number of implications for the physical state of the person and for the person's state of mind. By changing the mental state of a person, they make the person experience what is around them in a different way and make a mental association between the particular stimulus (object or event that caused the emotion) and the emotion felt (Damasio, 2000). The emotional state that was associated with the stimulus will be remembered whenever the person is thinking of that particular stimulus or whenever this is encountered again.

This is particularly important for emotions that are often sudden, like surprise. As surprise is the reaction to a sudden or unexpected stimulus, it puts the surprised person in a state of mind in which other senses and other emotions are heightened. If these other emotions associated with the event are positive ones, like joy, happiness or pleasure, this positive state will be amplified, and then remembered when coming into contact again with the surprising object.

This association can be seen very prominently in infants, through what Daniel Stern calls RIGs (Repetitions of an Interaction that has been Generalised) (Stern, 2000). For example, the way adults play with babies is a delicate balance between familiar and unfamiliar elements. On the one hand, the baby is more interested in familiar modes of interaction because they remind the baby of the previous times that interaction has taken place and evokes the previous situation. In such instances, babies can be found playing with a toy in the same way their mother plays with them (Stern, 2000). But by observing babies in their interactions, it is clear that if the game remains exactly the same, the baby loses interest in the game and gets distracted. Another typical RIG interaction is the peek-a-boo game, based on a combination of repetition and surprise. The first times the baby plays the peek-a-boo game it creates a little anxiety, since the mother's face disappears. But when it reappears, the relief and joy at seeing it again make the game fun. Therefore the mother repeats the game to produce the same emotional response in the baby. But the baby soon gets bored of the game and his reactions start diminishing; the mother will instinctively start varying the game, she'll use a different object to cover her face, or change her tone of voice, or the timing with which she uncovers her face to keep the baby interested.

The game soon turns into a RIG, evoking the feeling of joy again even when the game is played with other people, and even when the baby knows that the mother is still there. Initially, the baby finds interest in the game because of the pleasant surprise of finding that mum is still there, but after a few repetitions what drives the baby's interest is knowing that the mother is still there, being in on the joke in a way, and the situation evoking the initial pleasant emotion again. By evoking the surprise, the other feelings associated with it are also evoked, such as the joy of seeing the mother again.

Surprising stories

These concepts are applied in most narrative mediums, from public speaking to the way a narrative is set-up in books, films and music. Haydn's *Surprise* S*ymphony* (Symphony No. 94 in G major) was revolutionary for the time because in the middle of a very quiet *Andante* second movement, which is based on the variation on a universally well-known popular tune of the time, all of a sudden there is an outburst in a *Fortissimo* tune, which gives the

symphony its nickname of *Surprise Symphony*. There are several anecdotes about why Haydn did this, ranging from being angry with people who fell asleep during his performances to trying to outdo colleagues in the music world. Either way it is interesting to notice how the whole second movement is set up: it is extremely quiet and calm at the beginning, following a familiar and traditional first movement. And all of a sudden, with no warning, following a short pause, an extremely loud chord is played. It then goes back to being really quiet and mellow. The loud chord is repeated again several times throughout the whole movement; the small pause is followed sometimes by the loud chord, and sometimes by a mellower one in tone with the rest of the movement (Schwarm, n.d.).

The balance between the familiar and the surprising can be achieved on many different levels; to set up something familiar we can repeat it until it becomes familiar, or we can use something that already is well known. The surprise can then be achieved by playing with the user's/viewer's expectations derived from the repetition or from the context. These different types of surprises are used quite a lot in film, both when setting up suspense, and when using archetypal or stereotypical characters in unconventional ways. It is necessary in film to set up a familiar context in order to draw people in and make them relate to the characters. The film has to have familiar elements in order for the viewer to relate to it, but at the same time it has to have some surprising elements in order for the viewer to stay interested.

Surprise can be used in films to amplify different sorts of feelings; it is used to amplify fear in horror movies, to create suspense in mystery films or to make the jokes funnier in comedies. One of the most memorable surprises in film is the scene from Jaws (1975), when the shark is first seen coming out of the water. The situation is calm and the main character is speaking. Knowing it is a horror film about sharks one would expect to see a shark. But knowing horror films one expects the usual build up of music and situation. Then the shark shoots out of the water. The shark is seen out of the water several times throughout the three movies, but the way surprise is used in that moment makes this particular scene the most memorable one of the whole trilogy. When we watch the film again, the same feeling is evoked again, though we are fully expecting the shark to pop out.

What we expect of films is derived from our experience of events in real life as well as our experience of stories and films. When viewing a narrative fiction film the viewer's main activity is that of forming hypotheses about the way the story will unfold; these hypotheses are either validated or disproved as the story develops as expected or with surprising turns of plot (Bordwell, 1985). We can make hypotheses about the plot because we have expectations about how events unfold based on our own lives, the typical forms of stories, expectations

about particular genres and particular characters, props, locations, etc. These expectations are called 'schemata' (Bordwell, 1985). Bordwell describes four types of schemata, two of which are of particular interest to product designers: *prototype schemata* and *template schemata*.

Prototype schemata are used by the viewer to recognise what characters, props and locales contribute to the story. So, if you see a hooded character with a gun in a dark alleyway you expect something violent is going to happen. This is similar to the way we interpret semiotic signs about objects, such as affordances or object types. *Template schemata* are used by the viewer to understand the chronological plot of a story from a narrative structure that may not be linear. They allow viewers to slot the information into place and reconstruct the film's plot. Template schemata allow us, for example, to understand a cause and effect sequence, no matter what order it is presented in. Interestingly, plots are easier to remember when told in ways that are closest to these template schemata (or typical story structures). Most people will also retell a narrative in a way that is closer to a template schemata, though the initial story may not have followed such a linear structure (Bordwell, 1985).

Surprising things

An interaction with an object contains a sequence of events that happen over time; designers can design or direct these events to create a particular experience with the object, and template and prototype schemata can be a valuable way of looking at these sequences of events (Grimaldi, 2015). Designers can use the properties of template schemata to create patterns of surprise and predictability within a product experience, for example designing 'dramaturgical structures' into the story of the interaction (Löwgren, 2009). Template schemata also aid in understanding cause and effect patterns. Thus, keeping these in mind while designing might also help to create objects to which users might assign certain behavioural patterns (or even a *will*) if the object appears to cause a particular effect. In addition, designers might apply template schemata to make sequences of events better conform to particular story structures, and therefore be more memorable. Prototype schemata might also help designers establish what you may or may not expect from an object, and this may lead to objects that are surprising when designers play with these expectations (Grimaldi, 2015).

There need to be familiar elements in surprising objects in order to make us expect something from them, and a level of trust needs to be established. When you trust an object you know the object because it is part of a familiar class of objects that you have contact with all the time. This is trust at first sight, derived from your knowledge of the category of objects rather than the specific object itself. This is more prominent with objects that have turned into

archetypes, which everyone within the given culture already knows how to use. In a sense, it is harder to use surprise in digital objects for example, because we don't trust them, and we don't have such preformed expectations about the way they should work.

Surprising objects demand more attention from the user, simply because when an unexpected event occurs 'ongoing activities and information processing are interrupted and attention is focused on the unexpected event' (Ludden et al., 2004, p3). This can be achieved in a playful way and the surprise will be a pleasant one. In terms of product design, the designer can make use of a surprise reaction because it captures attention to the product, leading to increased product recall and recognition, and to increased word-of-mouth (Derbaix and Vanhamme, 2003; Vanhamme and Lindgreen, 2001). This is because the object is remembered is through a 'story of the experience' and this story is usually one that the user will tell to others. Creating a story around an object turns that object into a memento or *souvenir* of the experience, and in that sense, it becomes a special object to be cherished and kept rather than abused and discarded.

The benefits of creating emotional attachment to objects are clear. People treat objects that they are attached to with much more care, they service and repair them rather than throwing them out, and in general they will use them for a much longer period of time (Chapman, 2015; Govers and Mugge, 2004). Furthermore, when people have special bonds with a particular object, that object will be more enjoyable to use, and the user will be willing to cope with minor problems in its operation or appearance (Norman, 2003). 'There is something Orwellian about the distribution of emotions in our world: All objects can get some emotional attachment, but some objects get far more that others.' (Damasio, 2000, p58). There are many reasons why people become emotionally attached to objects; sometimes these have to do with the object itself, and could be based on things like the look of the object or on its comfort. More often than not though the emotional attachment has to do with a past experience with the object, either in the way that the object was acquired, for example a family heirloom or a memento, or in the fact that it was present at an important time, and reminds the user of an event, for example the piece of clothing worn on a first date (Csikszentmihalyi and Halton, 1981) . In many cases, the object is special because it is associated with a particular person or event; in other words, the object is special because of the story behind it. The emotion is therefore not always present in the object, but it is present through the way the object reminds the user of the way they felt in a certain moment or situation. This act of remembrance is dependent on, and inseparable from, the story itself. The story is necessary to facilitate the memory of the object, which then triggers the same emotion.

The concept of *narrativity* is relevant here (Abbott, n.d.; Herman et al., 2005). If we look at an interaction with an object in narrative terms, we are looking at a sequence of events presenting more or less opportunities for being told as an interesting, engaging and memorable story. A surprising object possesses more narrativity – more potential to be retold as a story. This is because a surprising event in a product interaction sets up a story, an interaction with a surprising object will be more prone to be interpreted and retold as a story, it will have more potential for narrative interpretations, or narrativity (for more on narrativity and design, see Grimaldi, 2015, 2013).

Events and experiences in our lives are often interpreted in the moment and remembered and recounted as stories (Bruner, 1991; Dewey, 2005; Forlizzi, 1997; Hassenzahl, 2010; Lowgren, 2009; Abbott, 2008; Bal, 2002; Young and Saver, 2001). In fact, people who have brain damage in the narrative parts of the brain (known as *dysnarrativia*) have problems remembering events, as memory appears to function on a narrative level, and in severe cases even forming a sense of self, because this is so tied to our personal narratives (Bruner, 1991; Sacks, 1998; Young and Saver, 2001). When thinking of a product experience as it unfolds over time, a surprising object will necessarily set up a narrative, for the simple fact that there is a point in time, the surprise, that divides the whole experience into a *before* and an *after*, and this creates a timeline and a narrative of sorts. The surprising event structures the experience of the object into a more traditional narrative (McKee, 1999) and the closer to conventional narratives a story is the easier it is to remember and retell (Bordwell, 1985)(for a more thorough review of narratives in design see Grimaldi et al., 2013).

By breaking your expectations, a surprising object also makes you aware of the fact that you do have expectations about objects, and of what these expectations are. The *before* is therefore related to your expectations, and the *after* is the discovery. It is as if the object, or the designer, were telling you something about yourself. In this way the object is not used but discovered, and through the process of engagement, allows you to discover something about yourself as well. The narrative is therefore transformed from a story about the object doing something, to a story about yourself, about the way the object made you feel and about the way you think. The comparison between the way a person felt before and the way that person felt after the surprise creates a story, and in this story the user is the protagonist. The concepts of 'user as protagonist' and 'designer as author' are widely explored by Anthony Dunne in *Hertzian Tales*, in relation to electronic objects (Dunne, 2008). It is possible, though, to extend the concept to all objects that provide a narrative experience to the user. The designer

is therefore not only designing the object itself, but also the product experience of which the user is the protagonist (Dunne and Raby, 2001; Dunne, 2008).

The result of focusing on surprise to design objects might be that the object actively encourages the user to interpret it as having a will, or agency, and somehow directing the story of the interaction, fostering more emotional attachment to the object and increasing the narrativity of the object, the gusto that someone might have in retelling the story of their interaction, increasing word of mouth and recall (Grimaldi, 2015).

Surprising designs

In order to review examples of surprising design, these are divided into types of surprise based on what the surprising element is, and how and when in the product experience the surprise is encountered. The three categories are *Seeing is believing?*, *Using is believing*, and *What is happening?* These categories are not meant to be an absolute metre to set objects apart, as most of the objects described will fit into more than one category, to differing degrees. They are nevertheless useful to provide a good frame of reference to discuss and compare surprising objects and to set some parameters for design work.

Seeing is believing? is based on first impressions and a purely visual surprise. It is the most instant and probably harder to sustain type of surprise, based on visual impact and visual incongruities. *Using is believing* is still an instant type of surprise, but it is based on the incongruity between what an object looks like and how it functions or feels. *What is happening?* includes objects which do not behave as expected or change their behaviour over time, or whose behaviour is unexplainable. In this way it is the one creating surprises that are most prolonged in time, since the behaviour only manifests itself on certain occasions, and it takes many repetitions of the behaviour to start trying to understand it logically.

Seeing is believing? – surprise based on visual impact

This category is the most immediate, and it contains all of those objects that are surprising at first sight. Many different types of surprising elements fit into this category; the surprise can be about the perceived material and the way in which this is used ('how does that stand up?') or about the viewer's cultural expectations ('is it a chair or a hammock?'). In any case, they are based on previously acquired knowledge.

Design objects in this category work on the principles of displacement and recognition; they take elements from a certain context, particularly elements that signify a certain context, and then apply them to a different context with surprising results. The contradictions work at first

sight at inducing emotions, but the way that emotion is sustained is through reflection. At first sight one might be induced to think, 'yes, it is nice, it is fun, but why?' but upon reflection the reason is discovered, and it starts to make sense. Because you came to that conclusion yourself, somehow you understood what the designer was trying to tell you, you feel engaged in a virtual dialogue with the designer – or with the object itself. In a way you feel like you were let in on a joke.

Figure 2: Knotted Chair by Marcel Wanders

Marcel Wanders' *Knotted Chair* plays with the contrasts between the visual elements of the product, and what these elements signify to the viewer/user. These visual signs come from different contexts; the overall shape references a traditional chair. Therefore the function of the object is clear and the viewer will know how to use it and that it is meant to be used. On the other hand the material and the way the structure is achieved through knots has diverse references, from hammocks to fishing and rock climbing, which reinforce the impossible look of the object. The reference to hammocks, in particular, makes one aware of the fact that the

'rope' should not be holding itself up but should be attached to something, in suspension. This feeling that rope should not be able to hold itself up and should definitely not be able to hold a person's weight is reinforced by the fact that the material is not yet known in this sort of application, and there are no other examples that one can refer to understand how it works (Manzini and Cau, 1989).

Figure 3: Waterproof Lamp by Hector Serrano

Hector Serrano's *Waterproof* Lamp for Metalarte plays in a similar way with displacement. It uses the archetypal table lamp shape, but places it in a swimming pool, therefore not only taking the object out of context, but including an element of danger, since a regular lamp would be very dangerous in a swimming pool. The shape of the lamp also references the shape of a lifebuoy, creating an additional layer of contrast between the image of danger created by the electricity in the water and the image of safety associated with the lifebuoy.
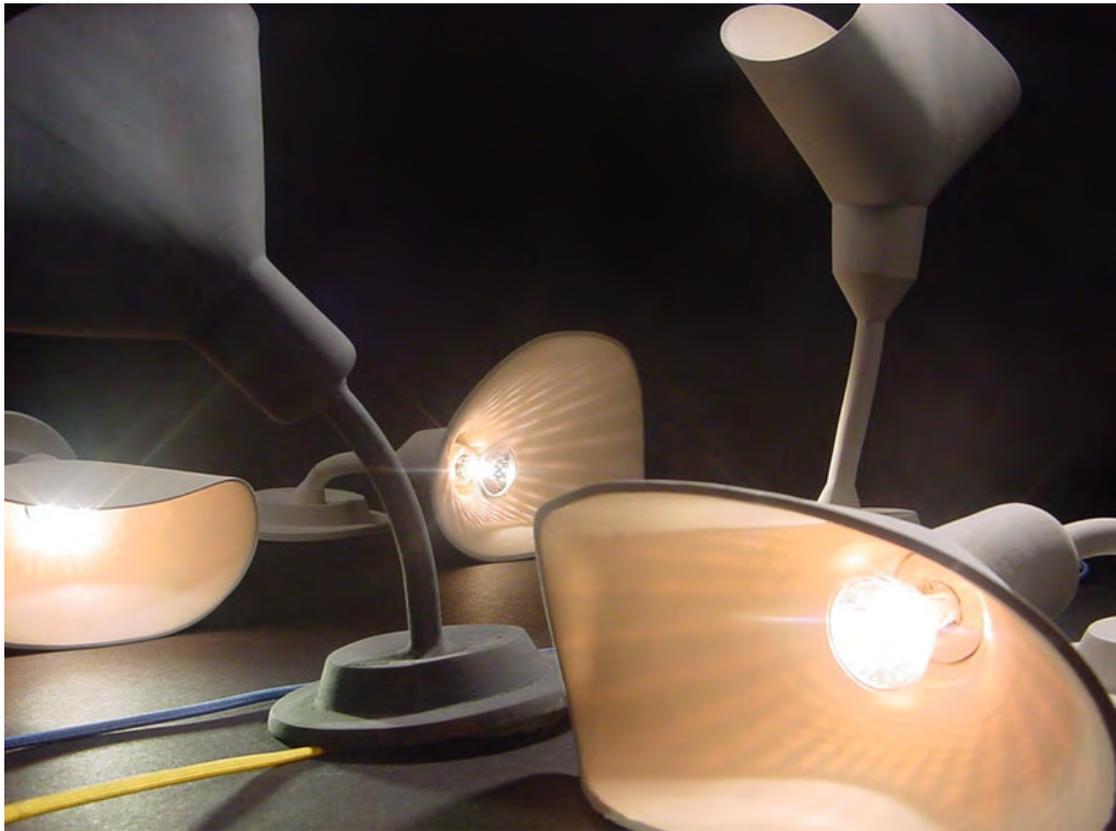
Figure 4: Spineless Lamps by Frederik Roij**é**

The *Spineless Lamps* by Frederik Roijé work on a different plane; they reference the shape of a generic table lamp, but they appear to be partially melted and to have lost their shape. They would appear damaged if you didn't encounter them on the shelf of a shop or in a museum, and if you didn't see them close to the others. On closer inspection, one sees that they are actually porcelain, which is a material that is not usually used for this type of lamp, but rather associated with fancy dinner plates and serving bowls – it is seen as a delicate and precious material. The shape of the lamp on the other hand is one typical of a utilitarian cheap lamp made with inexpensive materials. This contrast adds an additional layer of surprise and an additional layer of meaning to the piece.

The risk in this category is to create a novelty object; an object that is mildly surprising for a second and is quickly discarded and forgotten. It is important therefore that the object functions on many different levels, and that the viewer will not necessarily 'get it' all immediately. Ideally, it will be something that the viewer will reflect on and maybe understand later in time. Even if the understanding is not put into words, it creates a sort of fascination in the viewer because the comparison, though surreal, will be strangely familiar.

Using is believing – surprise through interaction

In a similar way to the previous category, the surprise is instant and could be considered a one off. The difference is that this category requires the user to not only look at the object, but also interact with it physically and there is a different approach to how the expectations to be broken are set up. While the previous category relies heavily on previously acquired knowledge, in this category it is possible to set up in the object itself certain expectations deriving from the way it looks. As a consequence, the surprising elements, which in this category can include the difference between how a material looks and how it feels or the difference between the affordances of the object and how the object is actually to be used, are a comparison between sight and other senses, or sight and function.

Figure 5: Grand Central Chair by David Rockwell

David Rockwell's *Grand Central Chair* is used in a waiting area in Grand Central Station in New York. This chair uses the language of traditional wingback armchairs and luxury travel in both its shape and its colours. It effectively looks like a cartoon caricature of an old-fashioned waiting room chair. But when the chair is used there are several surprises. Firstly the chair is slightly over-scaled, which is not noticeable at first sight. When sitting in it, this scale difference gives a feeling of protection and of having turned into a child. The second one is that the material used, while it looks like it might be a soft material, is similar to stone in texture and temperature. The material is also used in a way that conceals its tactile

properties, since it is shaped into a very soft form. The shape-based surprise plays on the expectations that people gain from the armchair sign.

Figure 6: Soft Urn by Hella Jongerius

The surprise in Hella Jongerius' *Soft Urn* is completely based on the material used; the form of the vase is very traditional and recognisable, and it would not be noticed at first sight in a group of vases. But when the object is used it is obvious that the material is not ceramic but rubber, and that the whole vase is soft. This is particularly effective when we think of the associations that a vase-form has, with a precious object that needs to be placed on a pedestal for fear of knocking it over and having it shatter. Rubber achieves the opposite effect, being a

common and inexpensive material that can easily be mass-produced, and definitely impossible to shatter.

Figure 7: Socket Light by Paul Hessels

Paul Hessels' *Socket Light* glows like a nightlight when something is plugged into it. The electrical socket is probably one of the most mundane and utilitarian objects imaginable. Nobody expects it to do anything besides receiving electrical plugs. The fact that it light up adds a small surprise and makes the user notice the socket, which they wouldn't usually notice, while still staying within the vocabulary of electricity and things that are found plugged into sockets, such as nightlights. In this case the surprise is also in recognising that it is really not that surprising; it makes complete sense that a socket, which provides electricity, should also glow with that same electricity. In realising this we also realise that the accepted way in which sockets are designed, the standard for these, is not a necessity but a choice. Sockets could have been designed in any number of other ways, and a lot of these ways make perfect sense or add something to the use of this object. The surprise provides us with the opportunity to not overlook this object but to reflect on why such a small and obvious change should be so surprising.

This process of setting up expectations is similar to the repetition of interactions, and the way this process is broken by the surprise is similar to what is done in narrative media to hold people's interest through breaking prototype schemata. By making an object look like something familiar, a sort of rhythm is established based on the viewer's knowledge of the signs given. The surprising element is what breaks this rhythm and makes the user pay attention to the object. As in other narrative forms, it is not essential that the object completely conceal the presence of a surprising element, as long as that element remains

somewhat unknown, or hidden. The surprising element in this category happens and has the most impact only once, on the first use. But again it is the presence of additional meaning that makes the emotion persist through time. By thinking about the object later on, one discovers more surprising elements that are not necessarily as immediate.

What is happening? – behavioural surprise

This category is the most diverse of the three; the unifying feature within the category is the fact that the surprise is not instant but it is discovered gradually through repeated interactions with the object. Within this category it is possible to make full use of the narrative structure of repetition and surprise, since the objects behave in different ways at different times. In this way the surprise has the possibility of being sustained over time, since the user will make hypotheses about what triggers the object's incomprehensible behaviour, and will expect it to react according to the hypothesis formed. The user will then have to wait for the situation s/he suspects triggers the reaction to happen again, and when the object does not react, a new theory will be formed.

In our everyday life one common source of this type of surprise are other people, or pets. They act in ways we think we can predict, but they do not always follow the same rules we would like to apply to them. Even when we think we can predict the behaviour because we *know* the person or pet very well, the predictions can never be accurate.

Figure 8: Nipple Chair by Dunne and Raby

Dunne and Raby's work with electromagnetic waves has produced some objects which could fit into this category, but the way in which they fit needs to be explained. All of the objects in the collection have a set behaviour based on their response to electromagnetic waves. They are meant to make the user aware of the presence of this *hertzian space* and interact with this space in a physical way. The objects were tested by finding volunteers that would 'adopt' these objects, live with them and then describe their reactions to the objects.

It is interesting to notice that the people who were using these objects in their home did not fully understand what triggered their behaviour. Of course, they knew they were responding to electromagnetic waves, but being that these are normally hidden from our view, it was often hard for them to picture what exactly was causing the object's behaviour. This sense of unpredictability is what many of the users found most interesting; they spent hours trying to figure out why the object was behaving in a certain way, moving the object about the house to find a place it 'enjoyed' and generally caring for the object and checking on it often to see how it was doing. The *Nipple Chair* had this effect on Neil, its user. Its form is very archetypal, but with two footrests and two 'nipples' on the backrest. When the chair is placed near electromagnetic waves, the nipples start moving. What intrigued Neil about the chair were those situations in which he did not understand what made it move. In particular, he describes coming home from work, and as he approaches the chair, it starts to move. 'When you come home at night, it speeds up and you think 'Oh, it's pleased to see me.'' (Dunne and Raby, 2001, section 5). This can be explained through static electricity, since he had carpeted floors and the build up of static electricity is picked up by the chair. But since Neil did not understand what was triggering it, he anthropomorphised the response, by assigning human-like motives to the chair's behaviour.

Throughout his interview, Neil refers back to how his lack of understanding and control over the chair's behaviour is what fascinated him the most. If there were a programmable interface, the chair would lose its meaning. He also spoke of how it is this lack of control that made him interact with the object in a way that is more similar to communicating with a human. Also, in his opinion, a combination between the lack of control and the attention to aesthetics is what distinguishes the chair from a gadget, and therefore gives the chair a much higher possibility of being kept and cherished for a longer period of time than any gadget.

Figure 9: Gauge by Jim Rokos

Jim Rokos' Gauge vase sets up a time-based surprise by tilting. The vase is at an angle, slightly precarious in its balance, and as the water evaporates the angle of the vase gets steeper. This increases the sense of precariousness but also reminds you to water the plant by making you realise why the vase is more tilted.

The first two categories are both based on instant types of surprises, and when successful they have a lot of initial impact on the user, but they are not necessarily objects whose surprise is repeatable over time. However if the surprise is able to create a story with the user, and an emotional attachment, this will sustain the interest of the user for longer. The third category unfolds over time and it creates the possibility that these objects will be treated in a way that is similar to living things makes them also very prone to emotional attachment. However, the risk is that the object itself won't be as interesting at first sight.

Designing for surprise - The Ta-Da Series

The *Ta-Da Series* is a series of three objects, consisting of a lamp, a stool and a set of coffee tables, designed through a technique of opposites and gut reactions to deliberately create a surprising user experience. (This will be described briefly here, for a full description please see Grimaldi, 2008, 2006). Using this technique allows designers to find, out of the infinite

number of surprises that could be incorporated into the product experience, one that is relevant, has some meaning and stimulates thought and reflection in the user. It also allows the designer to set up a coherent narrative for the product experience, starting from an initial situation in which the object may have some incongruous elements, different from the user's expectations and beliefs, to then having an event unfold through the surprise. This could be through sight, touch, or through prolonged use, and then the closure comes from understanding or resolving the initial incongruities.

It is therefore important to think of how the original scene is set up. How will the user first approach the object? Can any suspense build-up based on the way this first approach is designed? How will the unexpected or surprising element be discovered? How is the suspense resolved? Does this sequence achieve the desired effect, or the desired closure to the story? The first step is to assess which objects will be used and what their main characteristics are; which of these might be essential to an object (without that it wouldn't be the same object) and which instead could be changed. For example what characteristics make a lamp a lamp? An essential one is that it makes light; if it doesn't make light it wouldn't be a lamp. The second step is to find the opposite of one non-essential but still associated characteristic and turn it into a design concept. For example, fragility is usually associated with lamps, but it is not essential to its 'lampness'. The third step is to incorporate gut reactions as a way to reinforce the message and have it persist over time. For example, a fragile lamp sitting on the edge of the table creates a gut reaction to want to move it to a safer place. In the case of the *On-Edge Lamp* (below) the lamp sits on the edge of the table when it is on, and this reinforces the contrast between what we expect of the lamp (fragility) and what we are surprised by (the change of material to rubber).
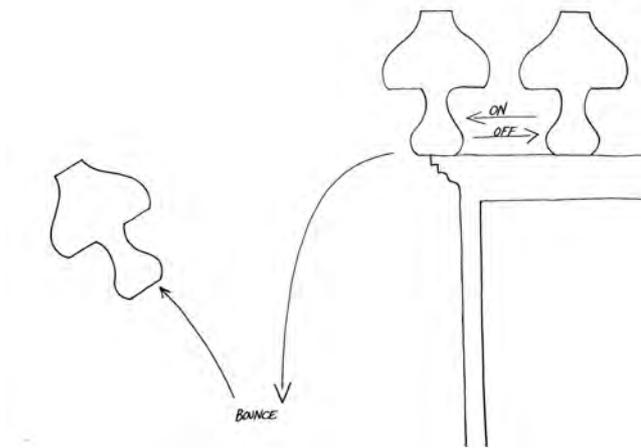
Figure 10: On-Edge Lamp by Silvia Grimaldi

The *On-Edge Lamp* sets out the scene by visually referencing art deco glass lamps, but sitting on the edge of a table. The user might see this and instinctively try to move the lamp to a safer spot on the table. When moving the lamp the user will be surprised to discover that it is made of rubber, and also that it only turns on when it is perching precariously on the edge of the table, when it is fully on the table surface the lamp turns itself off. The resolution to the story is the understanding of the designer's intention, as well as an understanding of their own preconceptions and gut reactions, and this will make the user smile. Though the object is initially puzzling, the user will then be surprised (emotionally charged event) and will then find closure in the positive realisation of the designer's intention. The precariousness of the lamp's positioning adds suspense to the story, the surprise is the punch line and the discovery that the lamp doesn't break provides closure and a happy ending. When used again, the sense of suspense becomes playful, though the gut reaction will continue to affect us when we see the lamp out of the corner of our eye. We will be reminded of the emotions felt at first interaction and the happy ending will make us smile again.

132

Conclusions

Surprise is a powerful emotion and it makes us more receptive to what is going on around us. It can also heighten any positive or negative impact that our experience has, because it adds the emotional charge of surprise. When thinking about designing products in terms of how people will interact with them, and how this experience of interacting with the object unfolds over time, incorporating surprising elements within a product experience helps to focus the user's attention and to make the experience more memorable. In addition, the surprising element helps to make the positive or negative emotions in the product experience more emotionally charged.

The way we interpret, remember and retell these product experiences is tied with narrative, as narratives are used to make sense of time, and time-based events. When we look at the way interactions with objects unfold over time, it makes sense to describe these product experiences in narrative terms. Adding a surprise to a product experience also facilitates this narrative interpretation, as it creates a timeline of before the surprise and after the surprise, and the user can compare their own feelings and ideas in the two stages.

Surprise is used extensively in narrative media to capture the audience's attention and to progress the narrative through techniques such as suspense. Understanding how this works, through prototype and template schemata for example, can help designers to look at when in the product experience it is most appropriate to introduce surprising elements in order to aim for the most impact. In addition, because a surprising story is necessarily emotionally charged it will stay with us longer, and seeing the product again will remind the user of the emotions felt.

Looking at the product experience through a narrative lens, the designer can envision what the user's process of discovery will be. The designer can then 'direct' the user's experience of the product through designing-in events that will happen at particular moments in time, for example details that may only be noticed once the object is seen closer up, or once the object is touched, or when the object is used over a longer period of time. If these events make sense to the meaning of the product experience narrative, this will also add a level of reflection for the user which may happen after encountering the object. The designer can't possibly control how every user will approach and interpret the designed object, but by understanding emotions and narrative, the designer can build in clues that are likely to trigger particular reactions at particular points in the experience. By understanding surprise in more detail the

designer can include relevant and meaningful surprising elements that may shape the story of the interaction for the user.

In this way though, surprise is a sudden emotion and we can only be truly surprised about an event once. After that, the object that surprised us will become part of a narrative in our mind about the first product experience. Though the surprise is not sustained over time, the attachment to the object created by the surprising product experience and the narrative around this can be sustained over time. Whenever the user sees or uses the surprising object again they will be reminded of the initial interaction and the emotions created in that interaction will be evoked. This makes the object more likely to be one that is kept, maintained, cherished and repaired when broken, rather than discarded before its time.

References

Abbott, H.P. (n.d.) 'Narrativity', in: Hühn, P., et. al (Eds.), *The Living Handbook of Narratology*, Hamburg University Press, Hamburg.

Bordwell, D. (1985) *Narration in the Fiction Film*, Univ of Wisconsin Press.

Bruner, J. (1991) 'The narrative construction of reality', *Critical Inquiry* Vol.18, No 1, pp 1–21.

Chapman, J. (2015). *Emotionally Durable Design: Objects, Experiences and Empathy*, Routledge.

Csikszentmihalyi, M., Halton, E. (1981) *The Meaning of Things: Domestic Symbols and the Self*, Cambridge University Press.

Damasio, A. (2000) *The Feeling Of What Happens: Body, Emotion and the Making of Consciousness*, New edition. ed. Vintage.

Darwin, C. , Ekman, P., Prodger, P (1998) *The Expression of the Emotions in Man and Animals*, Oxford University Press.

Derbaix, C., Vanhamme, J. (2003) 'Inducing word-of-mouth by eliciting surprise – a pilot investigation' *Journal of Economic Psychology*, Vol 24, Issue 1, pp 99–116. doi:10.1016/S0167-4870(02)00157-5

Desmet, P.M.A. (2004) 'From disgust to desire: How products elicit emotions', in: McDonagh, D., Hekkert, P., Erp, J. van, Gyi, D. (Eds.), *Design and Emotion*, CRC Press.

Dewey, J. (2005) *Art As Experience*, Perigee Books.

Dunne, A. (2008) *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design*, MIT Press.

Dunne, A., Raby, F. (2001) *Design Noir: The Secret Life of Electronic Objects*. August/Birkhauser.

Ekman, P. (2014) 'Expression and the Nature of Emotion' in: Scherer, K.R., Ekman, P. (Eds.), *Approaches to Emotion*, Psychology Press, pp. 319–344.

Forlizzi, J. (1997). Designing for experience: An approach to human-centered design. *Master of Design in Interaction Design, Department of Design, College of Fine Arts, Carnegie Mellon University.*

Govers, P.C., Mugge, R. (2004) 'I love my jeep, because it's tough like me': The effect of product-personality congruence on product attachment' in: *Proceedings of the Fourth International Conference on Design and Emotion*, Ankara, Turkey.

Grimaldi, S. (2015) 'Narrativity of Object Interaction Experiences: A Framework for Designing Products as Narrative Experiences' in: *Experience Design: Concepts and Case Studies*. Bloomsbury Academic, London ; New York, pp. 57–68.

Grimaldi, S. (2013) 'Story of Use: Analysis of Film Narratives to Inform the Design of Object Interactions' in: Brandt, E., Ehn, P., Johansson, T.D., Hellström Reimer, M., Markussen, T., rda, A.V. (Eds.), *Nordes 2013: Experiments in Design Research,* The Royal Danish Academy of Fine Arts, Schools Architecture, Design and Conservation, Copenhagen-Malmö., pp. 374–377.

Grimaldi, S. (2008) 'The Ta-Da Series – A Technique for Generating Surprising Designs Based on Opposites and Gut Reactions' in: Desmet, P.M.A., Karlsson, J. van E. (Eds.), *Design and Emotion Moves*, Cambridge Scholars Publishing.

Grimaldi, S. (2006) 'The Ta-Da Series: presentation of a technique and its use in generating a series of surprising designs' Presented at the *5th International Design and Emotion Conference*, Chelmers University of Technology, Goteborg Sweden.

Grimaldi, S., Fokkinga, S., Ocnarescu, I. (2013) 'Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice' in: *Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces, DPPI '13*. ACM, New York, NY, USA, pp. 201–210.

Hassenzahl, M. (2010) *Experience Design: Technology for All the Right Reasons*, Morgan & Claypool Publishers.

Herman, D., Jahn, M., Ryan, M.-L. (Eds.), (2005) *Routledge Encyclopedia of Narrative Theory*, 1st ed. Routledge.

Löwgren, J. (2009) 'Toward an articulation of interaction aesthetics' *New Review of Hypermedia and Multimedia* Vol 15, No 2, pp129–146.

Ludden, G.D., Schifferstein, H.N., Hekkert, P. (2004) 'Surprises elicited by products incorporating visual-tactual incongruities' in: *Fourth International Conference on Design and Emotion*, Ankara, Turkey. Available from: http://www.studiolab.nl/manila/gems/ludden/paperDE.pdf [Accessed: 1 December 2015]

Manzini, E., Cau, P. (1989) *The Material of Invention*, MIT Press.

McKee, R. (1999) *Story: Substance, Structure, Style and the Principles of Screenwriting*, Methuen Publishing Ltd.

Norman, D.A. (2003) *Emotional Design: Why We Love (or Hate) Everyday Things*, 1st ed. Basic Books.

Sacks, O.W. (1998) *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*, Simon & Schuster, New York.

Schwarm, B. (n.d.) 'Surprise Symphony | work by Haydn' [WWW Document]. *Encyclopedia Britannica* URL http://www.britannica.com/topic/Surprise-Symphony [Accessed 15 September 2015].

Stern, D.N. (2000) *The Interpersonal World Of The Infant: A View from Psychoanalysis and Developmental Psychology*, Basic Books.

Vanhamme, J., Lindgreen, A. (2001) 'Gotcha! Findings from an exploratory investigation on the dangers of using deceptive practices in the mail-order business'. *Psychology and Marketing* Vol18, No 7, pp 785–810.

Young, K., Saver, J.L. (2001) 'The Neurology of Narrative' *SubStance* Vol 30, No 1/2, pp 72–84.

Figures

Appendix 14: Full set of design concepts

TTS 1 kettle with
ghost-like agency

ball-bearings
rattle w/
strange
sound when
water boils

"rattle my
teaaaaaa"

experiments
with the
whistle
pitch.

hovering
(or appears
to be hovering)

kettle hovers
as water
boils

139

TTS2 kettle that
is mad (crazy)

② kettle that is mad (crazy) / TTS

lots of behaviors
alternate with
no sense. e.g.
- whistle (short)
- rock
- spin
- rattle

TTS3 a kettle that
makes user mad (crazy)

③ a kettle that makes user mad (crazy) TTS
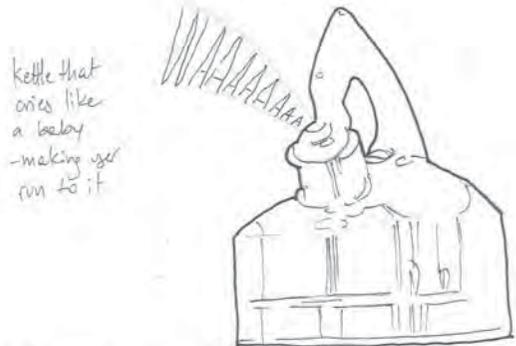
kettle that
cries like
a baby
- making user
run to it

WWAAAAAAAA

③ TTS

kettle that
travels (rumbling)
making you
check on it
or it might
fall off stove
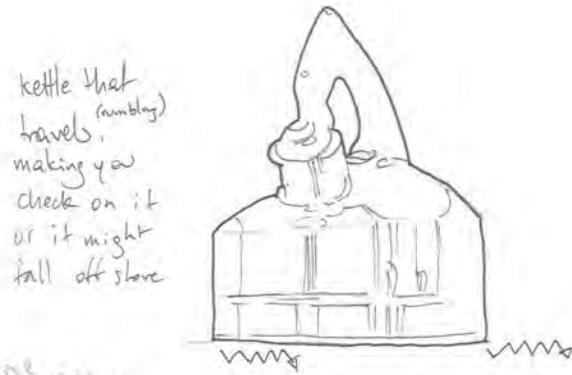
VD

VD 1 kettle as a dangerous
         object.

S3 role change:
     calm to weapon

towelling wrap
for kettle

shape of
spout pours
water forward
rather than
down

irregular
edge makes
pouring
unpredictable

141
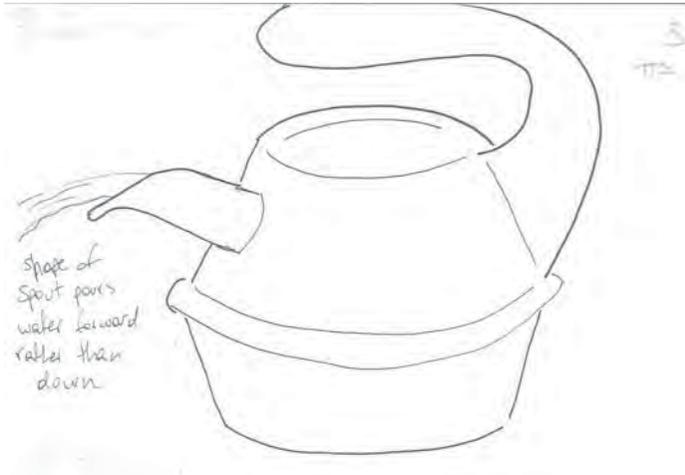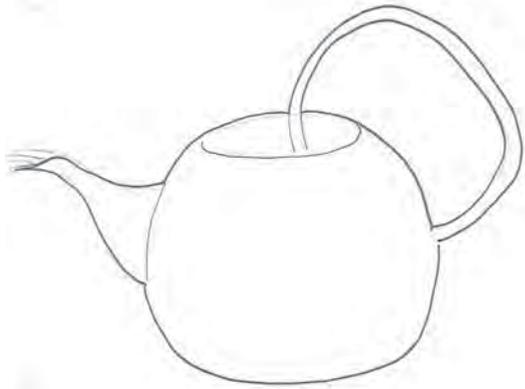
handle
positioned
for throwing

spout gets
smaller
+ directs
water out

easily
dented
kettle
- wants
to hurt
you back
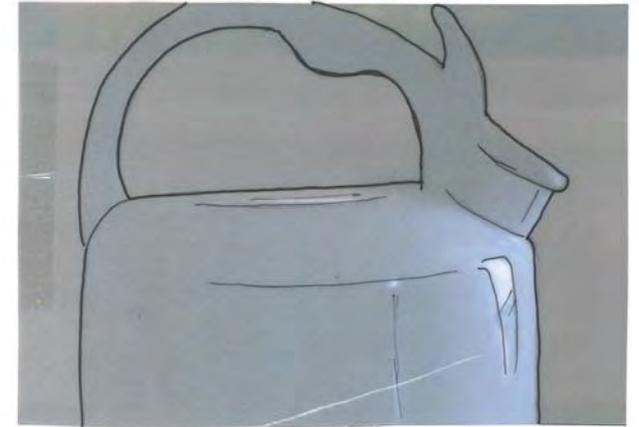
W1 sudden switch
between worlds

how can a kettle change
the space (world) around it?
- sound — whistle
         rumble
         click
- temp? → kettle/radiator
- claims/forces a space
- divides a space — kettle
                   electric cord?
- steam?
- light — illuminate
        projection
        glow

drastic
change of
sound when boils
- calm to scream
- distressing hum to
  pleasant-tuned
  whistle

(1) sudden switch between worlds

illuminating
• from off to on
• change colour.

projections
{ either on then off
• or viceversa
• or change pattern/colour

light:
• glow as boils
• change colour of glow.

glow in pattern when boil

add ... slices

rumble
whole kettle shakes when boiling

with or without a base
wibble wobble

underwater scene printed inside kettle

limescale decorations?
(spray ... something that limescale sticks on w/ stencil on inside)

143

S4 - timing Structure

equilibrium Ⓑ

see
lift
carry
fill
carry
replace
turn on
wait
boil
lift
pour
replace

→ conflict → encourage checking on?
→ climax
→ closure

beeps?
→ boil sound?
about to overboil out?

colour changes?
reveals picture?

Thermochromic ink?

patterns / pictures are revealed as water gets warm.

they disappear or change when boiling

several layers of paint activated @ different temp.

S2 kettle represents calm / domestic / comfort

taking equilibrium literally

· small holes for water in and out (lengthen microcurrent)
· lots of resistance for quick boil

Sleeve turns kettle into hot water bottle

Made of recycled men's sweaters

Pockets for hands.

fluffy slots in kettle (pockets)

slots in kettle (pockets)

S1 Masochist's kettle
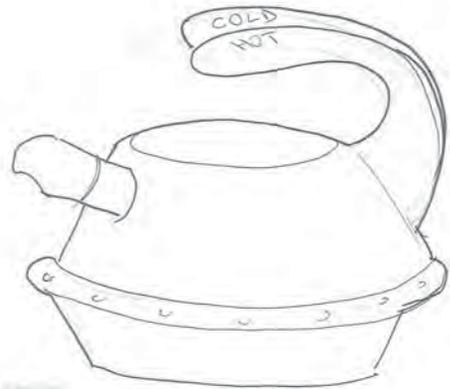
open
for steam

metal

rubber

2 handles
one hot
one cold.

COLD
HOT

rubbery
feel.

> visually playful / burns you

146
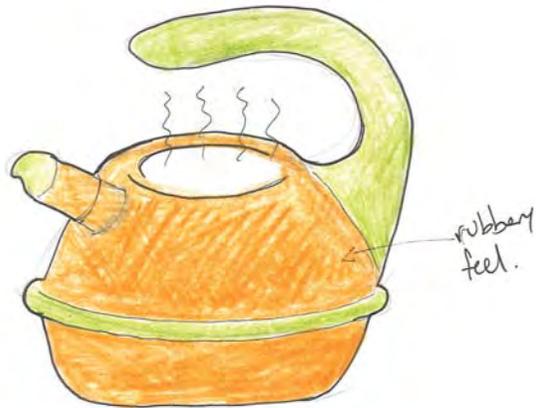
Goodmorning!

Goodmorning!

underside of the
handle leave message
printed on hand.

Appendix 15: Full design process of the 4 kettle prototypes

Kettle 1 design process

Briefs for Tale of Two Sisters

Brief 1 (S1)

Masochist's kettle

Brief 2 (S2)

Kettle represents calm/domestic/comfort

Brief 3 (S3)

Kettle role change: from calm to weapon

Brief 4 (S4)

Following the timing structure of the kettle scene

Matrix plots

Sketches S1

@masochist's kettle

open for steam

S1A

D2? chronology

metal

rubber

S1B

D3 agency (ow, the bastard!)

COLD
HOT

2 handles
one hot
one cold.

S1C

D3 agency

rubbery
feel.

S1D

D5? change

visually playful / burns you

Sketches S1

D5: not fully predict

S1E

underside of the
handle leave message
printed on hand.

D5: closure

S1F

Sketches S2
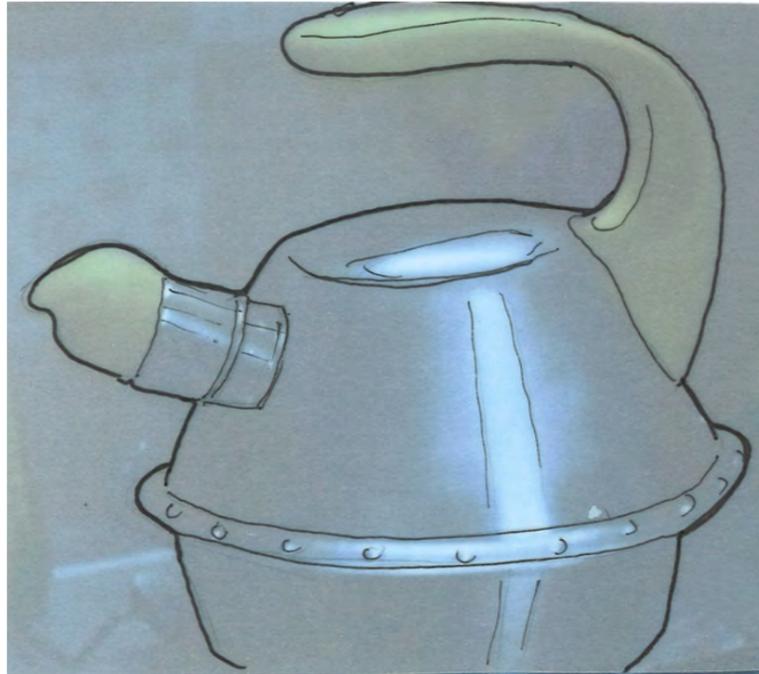
① kettle represents comfort

Sleeve turns kettle into hot water bottle

DA: affect

S2A

②
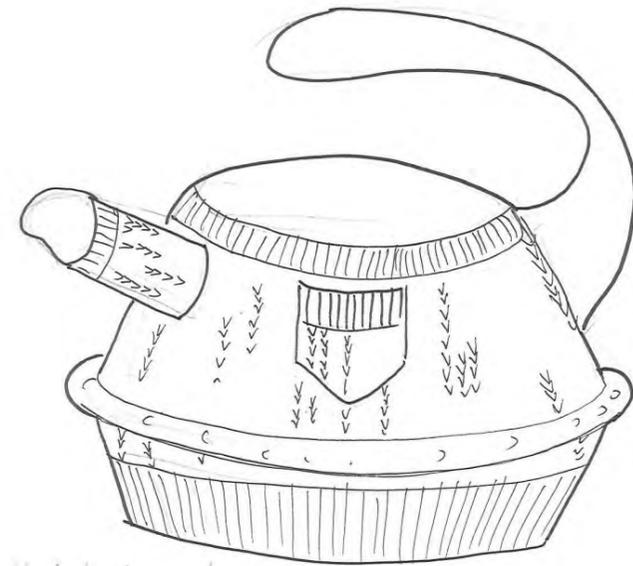
made of recycled men's sweaters

DA. affect (value / character. (D2)

S2B

②

Pockets for hands.

DA affect   D2 character   D3 agency (put hands in pocket)

S2C

②

fluffy slots in kettle (pockets)

DA affect   D3 agency (pockets)

S2D

②

slots in kettle (pockets)

D3. agency (pockets)   D5: not fully predict

S2E

156

Sketches S3

③ calm to weapon

S
TTS

S3A

③ calm to weapon

S
TTS

shape of
spout pours
water forward
rather than
down

S3B

③ calm to weapon

irregular
edge makes
pouring
unpredictable

S3C

③

S
TTS

handle
positioned
for throwing

spout gets
smaller
+ directs
water out

S3D

③ calm to
weapon

easily
dented
kettle
- wants
to hurt
you back

S3E
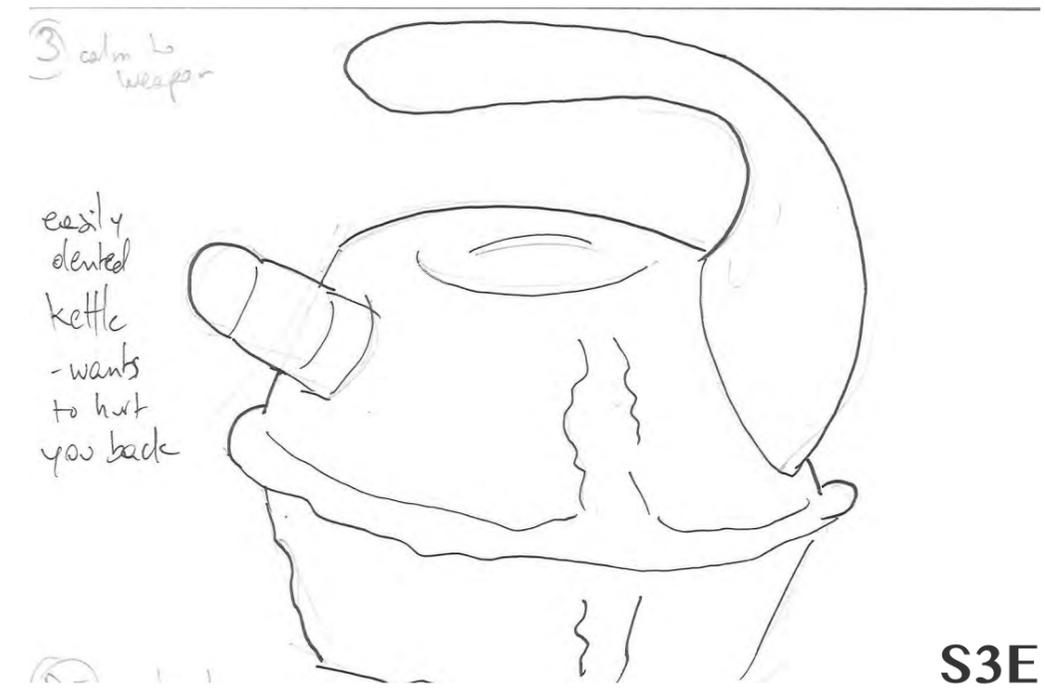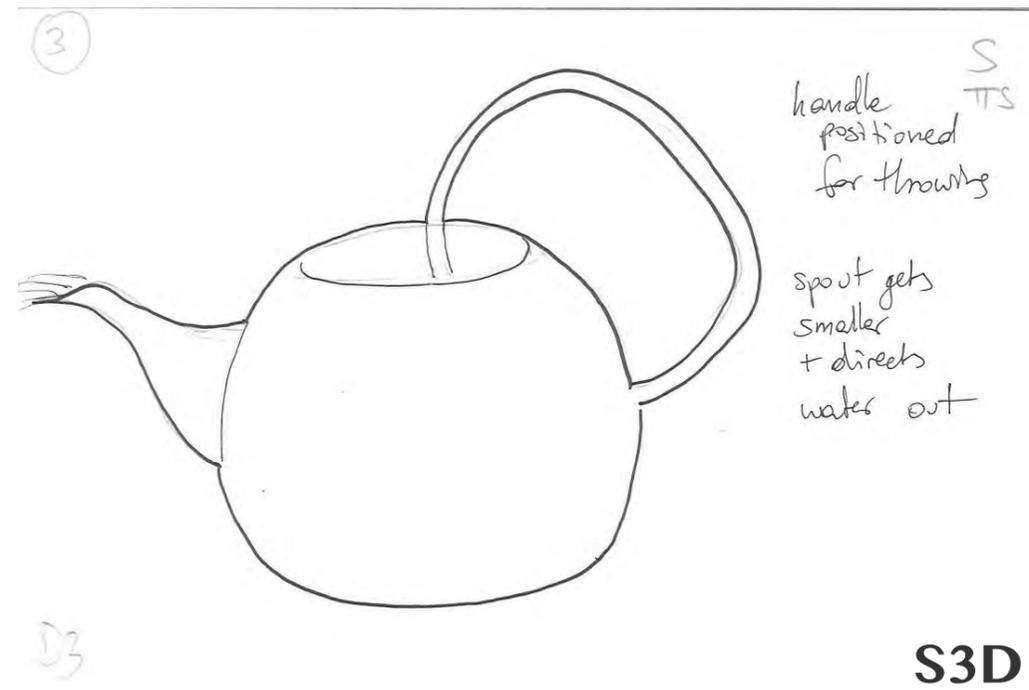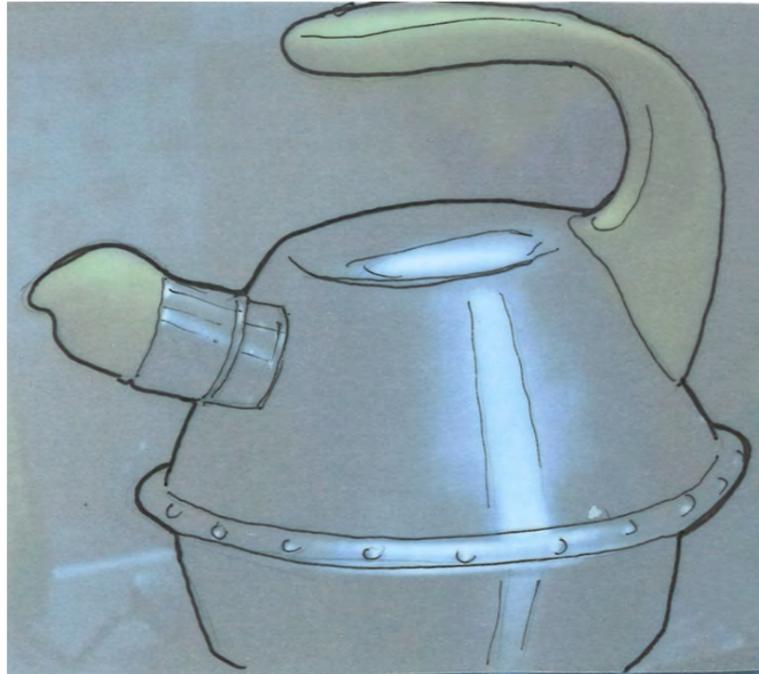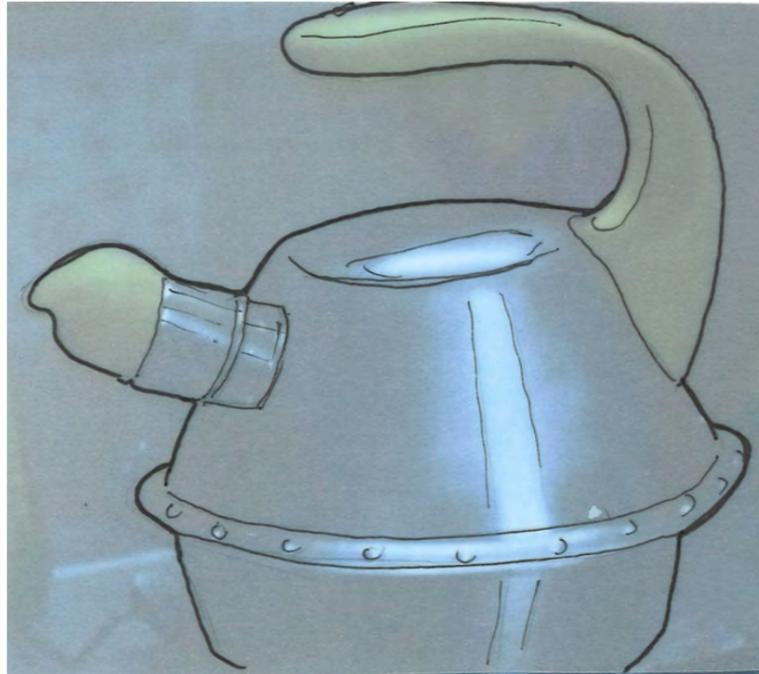
Sketches S4

patterns / pictures are
revealed as water
gets warm.

they
disappear
or change
when
boiling

several layers
of paint activated
@ different temps.

S4A

taking
equilibrium
literally

S4B

④ timing
structure

· small holes for water in and out (lenghten micro-event)
· lots of resistance
  for quick boil
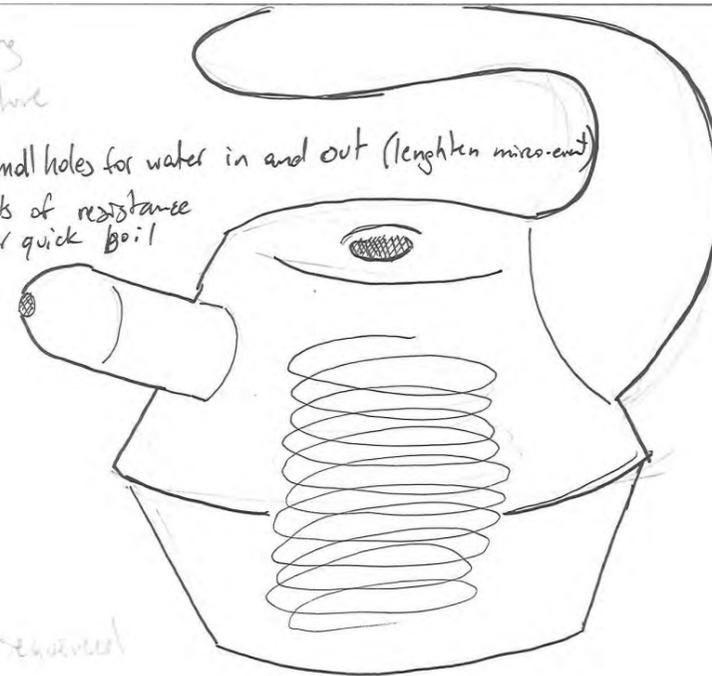
S4C

Selected for development

S2B - Kettle represents calm/domestic

also incorporating elements of character as well as S4A - as the water boils there is a change, pattern is revealed over time.

Kettle aesthetics - variables

stovetop

electric

with base

no base

texture

lids

glass

plastic

clear

matte — **colours**

surfaces / colours

metal

enamelled

whistle

copper

other

stainless

aluminium
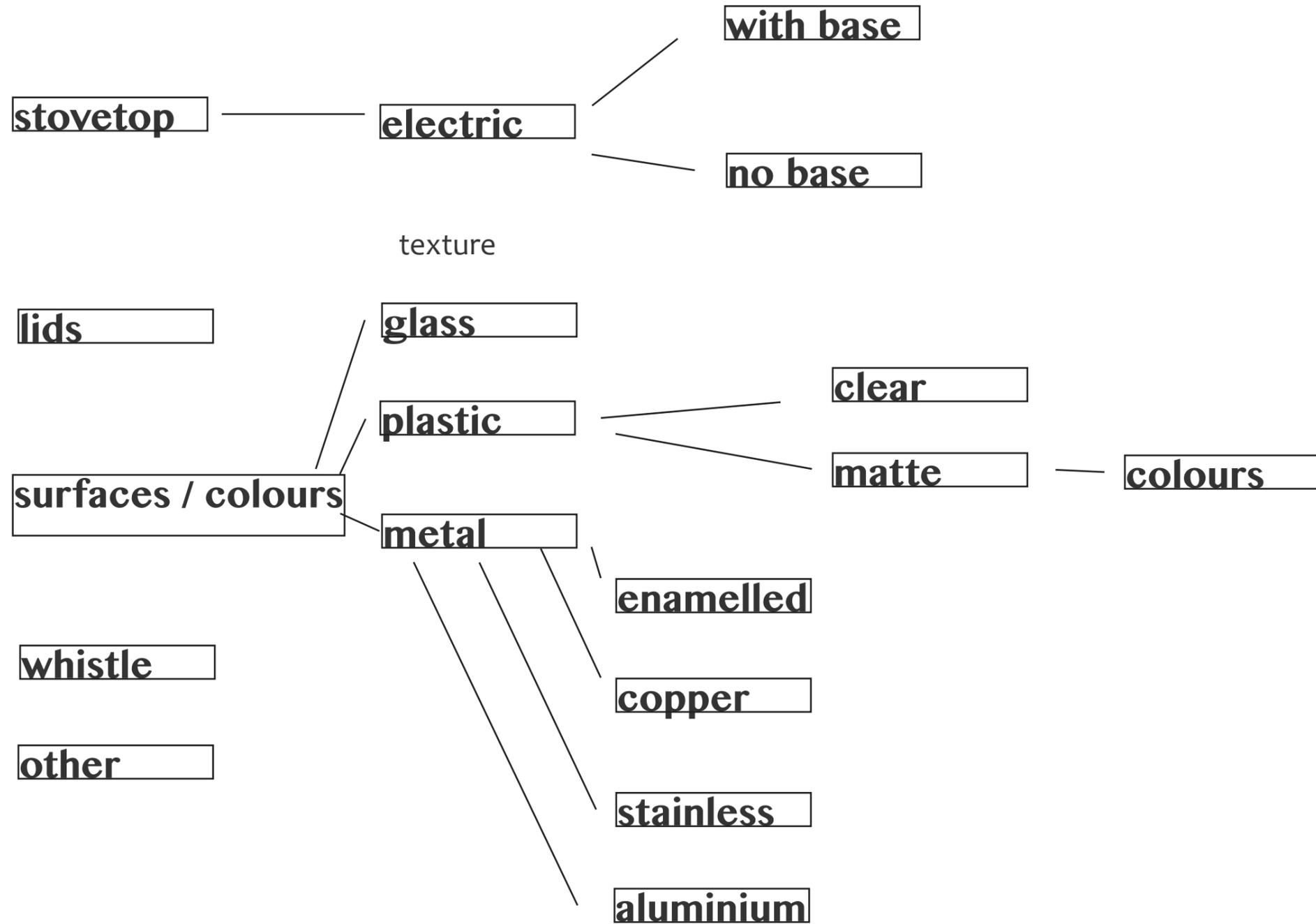
**Kettle aesthetics -
taxonomy overall form**
"sleazy old man"
characteristics

tall

rounded
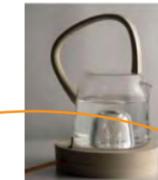
angular

squat

Kettle aesthetics - taxonomy handle

rounded

straight

top

Kettle aesthetics - taxonomy spout

shaped

straight

long

Selected Kettle to modify

Jumper experiments

Knit neoprene sleeve
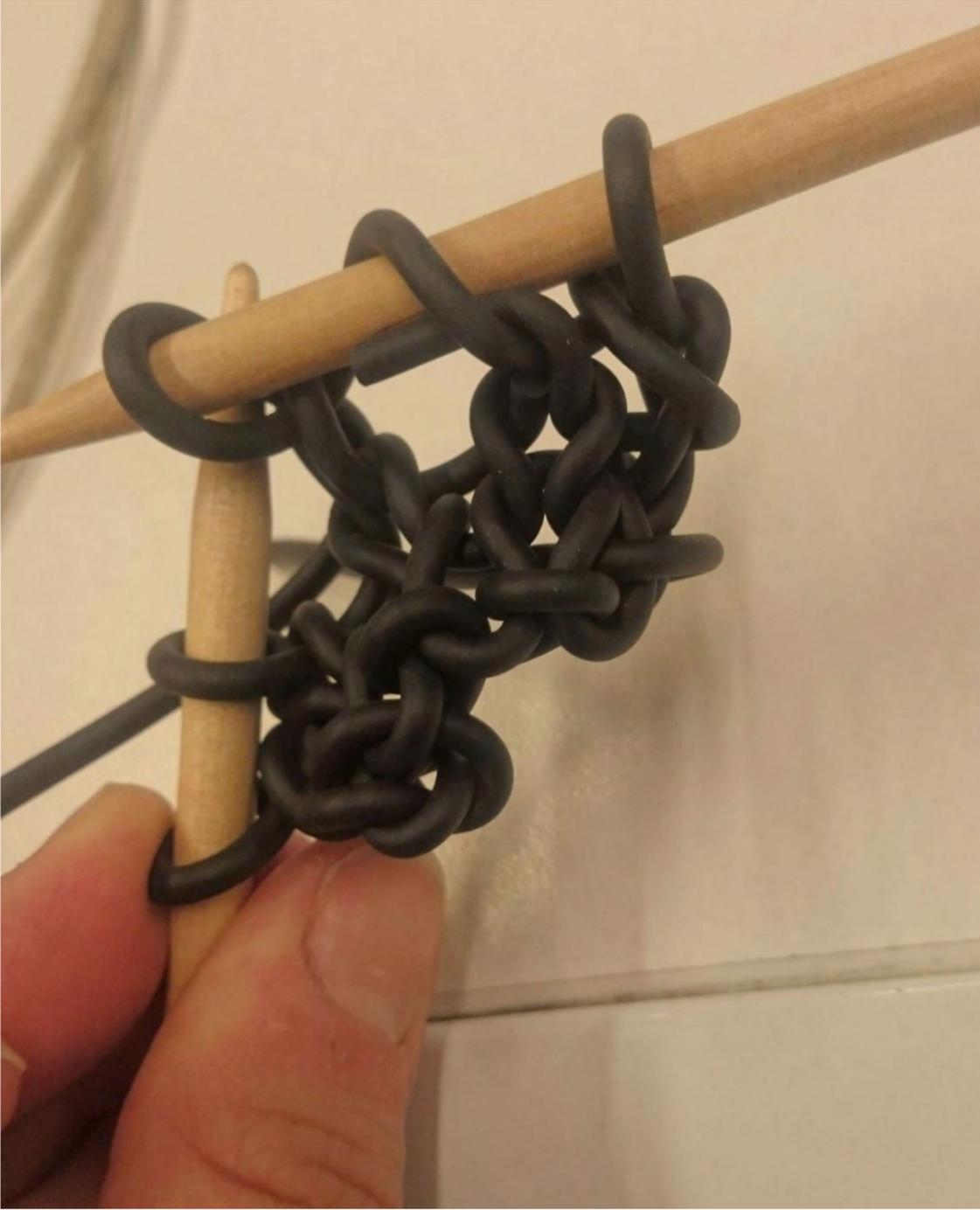
hand-knit pattern
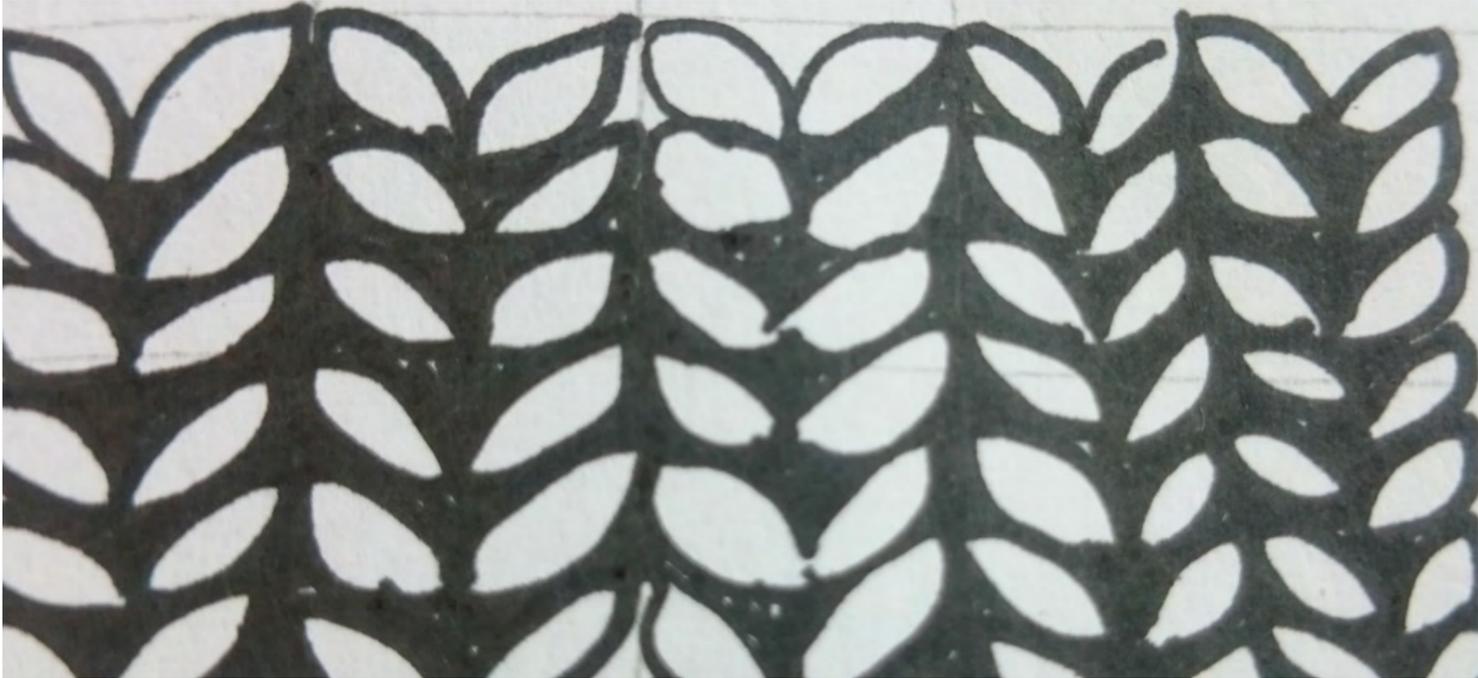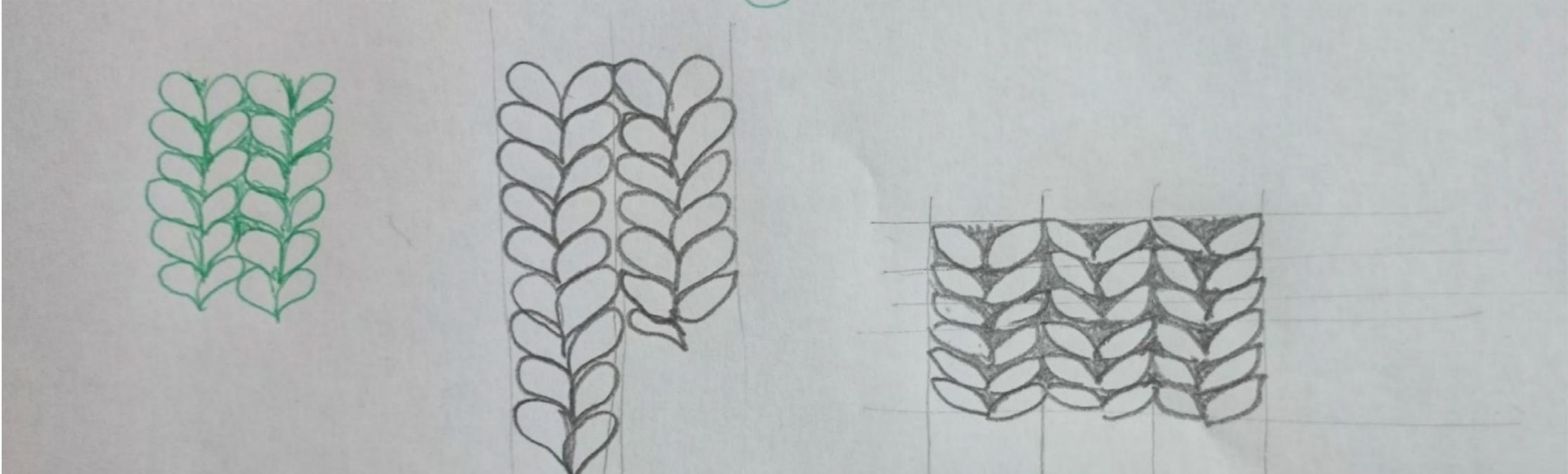
Video + illustration of behaviour

Kettle 2 design process

**Briefs for Tale of Two
Sisters**

Brief 1 (TTS1)

Kettle with Ghost-like agency

Brief 2 (TTS2)

Kettle that is mad (crazy)

Brief 3 (TTS3)

Kettle that drives the user mad (crazy)

Matrix plots

DEFINITIONS:

- D1: Minimal
  - events
  - representation
- D2: Sequenced
  - structured progr
  - chronology
  - charact/ entity
- D3: Logically Sequenced
  - cause/effect
  - agency
- D4: Value laden
  - affect
  - value
- D5: Entertainment
  - conflict
  - climax
  - change
  - coherence
  - equilibrium
  - closure
  - not fully predict.
  - hero
  - antagonist
  - motivation

TYPOLOGY:

- 1.1 activates stories (associated or remembered)
- 1.2 facilitates story imagining
- 2.1 research tool
- 2.2 analysis or idea generation tool
- 3.1 accompanying external narrative
- 3.2 structures user experience as narrative

NARRATIVE FUNCTIONS:

- 1: convey information
- 2: evoke reflectivity
- 3: show/teach values
- 4: empathy and identification
- 5: imagination and creativity
- 6: increase memorabillity
- 7: delighting
- 8: persuading (incl. lying)
- 9: cohesion and comprehension

MICRO-EVENTS:

- see kettle
- lift off base
- carry to sink
- open top
- limescale inspection
- empty out water
- rinse out
- fill kettle
- fill from lid
- fill from top
- close top
- carry to base
- replace on base
- turn on
- turn on repeatedly/ double check
- observe light change
- wait for boil
- do something else
- check on kettle
- boil
- click
- steam
- noise
- whistle
- run to kettle
- turn off
- lift kettle off base
- pour water
- replace onto base

(Annotation nodes: TTS1D, TTS2A, TTS3B, TTS1C, TTS1A, TTS1B, TTS3A)

# Sketches TTS1

① kettle with ghost-like agency   TTS

ball-bearings
rattle w/
strange
sound when
water boils

"rattle my
teaaaaaa"

D5 not fully predictable
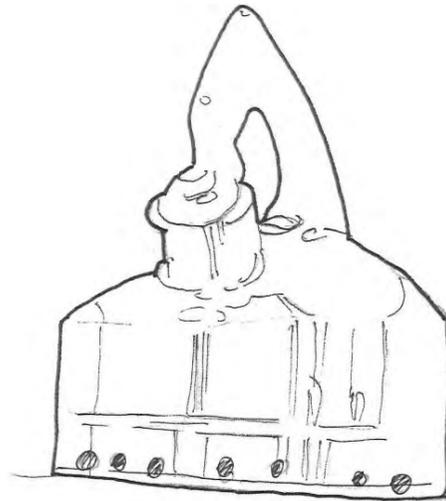
TTS1A

① TTS

experiments
with the
whistle
pitch.
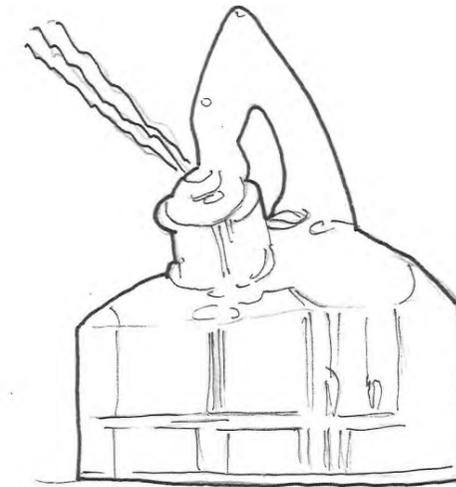
D4 affect/valve

TTS1B

①

hovering
(or appears
to be hovering)

D4: affect

TTS1C

①

kettle hovers
as water
boils
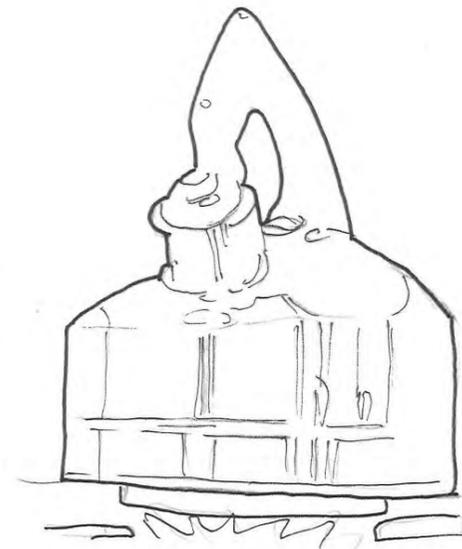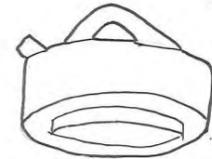
D4: affect ; D5: agency

TTS1D

Sketches TTS2
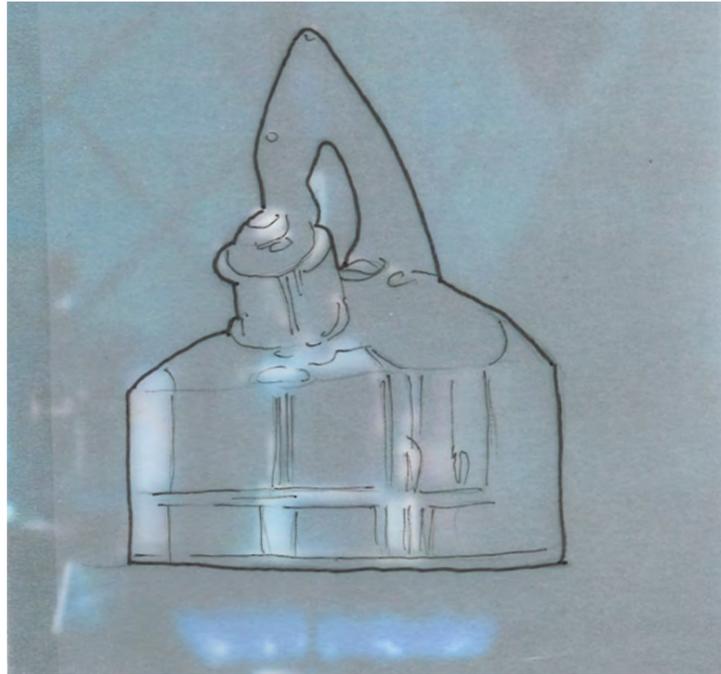
② kettle that is mad (crazy) / ④ quick sequence/lots .   TTS

lots of behaviors
alternate with
 no sense. e.g.
-whistle (short)
-rock
-spin
-rattle
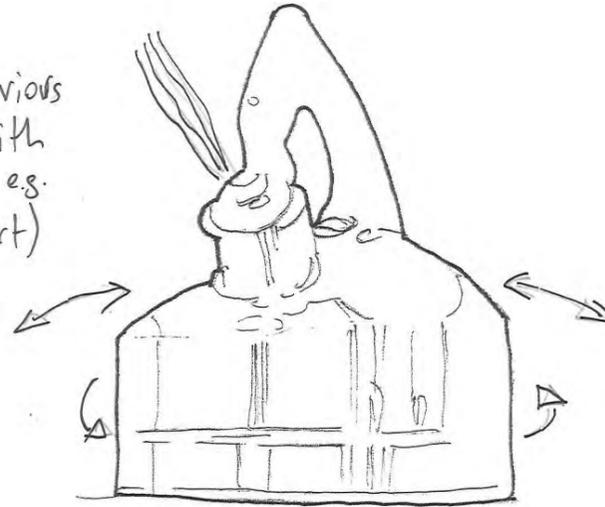
D2   character   D2   sequenced

TTS2A

Sketches TTS3
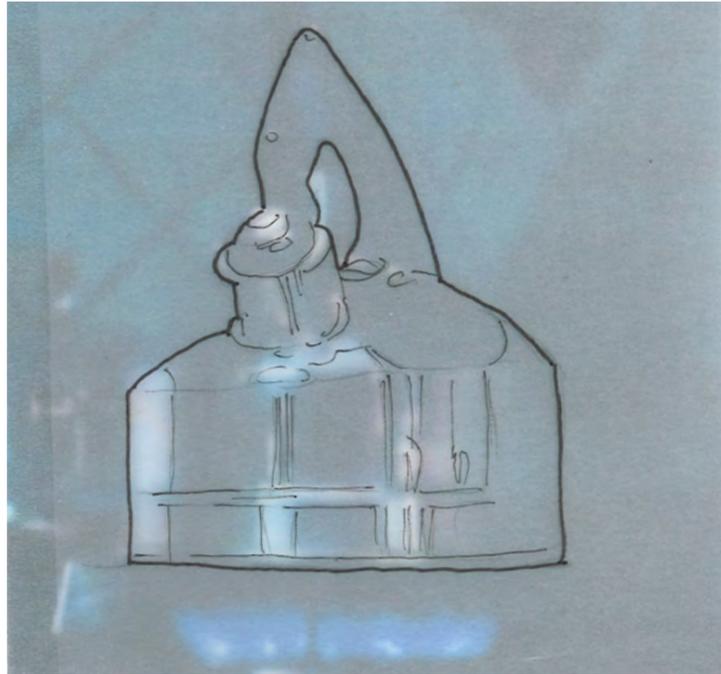
kettle that
cries like
a baby
—making user
run to it

WAAAAAAAAA

D4 affect   D3 agency, cause + effect
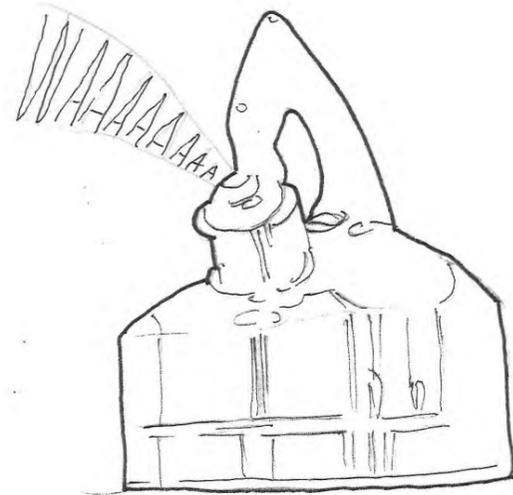
TTS3A

kettle that
travels, (rumbling)
making you
check on it
or it might
fall off stove
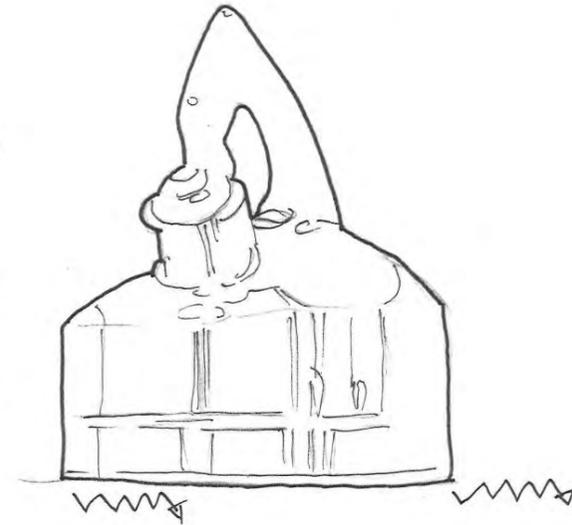
D3 agency

TTS3B

Selected for development

TTS1A - Kettle with ghost like agency- rattling

also incorporating elements of unknown behaviour and unexpected sound and a story arc of something happening more and more climaxing when the water boils and then relaxing.

Kettle aesthetics - variables

stovetop — electric — with base / no base

texture

lids

surfaces / colours — glass / plastic — clear / matte — colours

metal — enamelled / copper / stainless / aluminium

whistle

other
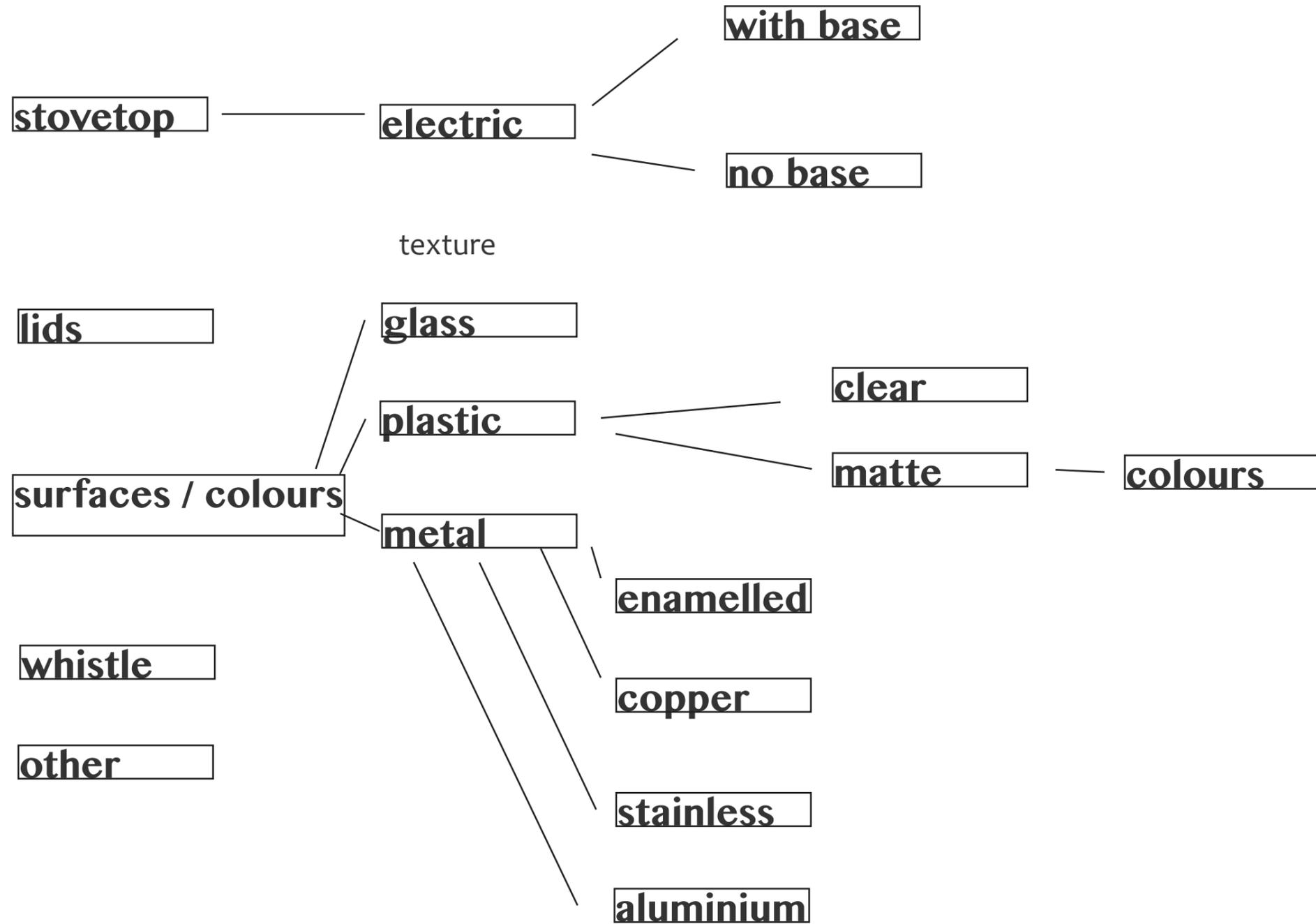
Kettle aesthetics - taxonomy overall form

tall

rounded

angular

squat

177

Kettle aesthetics - taxonomy handle

rounded

straight

top

178

Kettle aesthetics - taxonomy spout

shaped

straight

long

Selected Kettle to modify

Surface

The original kettle had a chromed finish and a watermark. Both were removed and the surface was re-finished to a matte metallic brushed surface.

IMAGE

Sound

Experimenting with ball bearings, bits of metal, etc did not produce enough of a rattling.

Discovered the pot-watcher online, it's designed to rattle to alert to milk boiling before it overflows. Two of these produced a loud enough rattle.

Video + illustration of behaviour

Kettle 3 design process

Briefs for Wristcutters, A Love Story

## Brief 1 (W1)

sudden shift between worlds

Matrix plots

MICRO-EVENTS:

Row	
see kettle	
lift off base	
carry to sink	
open top	
limescale inspection	W1e
empty out water	
rinse out	
fill kettle	
fill from lid	
fill from top	
close top	
carry to base	
replace on base	
turn on	W1b
turn on repeatedly/ double check	
observe light change	
wait for boil	
do something else	
check on kettle	
boil	W1g ← W1cdef
click	
steam	
noise	
whistle	W1a
run to kettle	
turn off	
lift kettle off base	
pour water	
replace onto base	

Column headers:

DEFINITIONS:
- D1: Minimal — events — representation
- D2: Sequenced — structured progr — chronology — charact/ entity
- D3: Logically Sequenced — cause/effect — agency
- D4: Value laden — affect — value
- D5: Entertainment — conflict — climax — change — coherence — equilibrium — closure — not fully predict. — hero — antagonist — motivation

TYPOLOGY:
- 1.1 activates stories (associated or remembered)
- 1.2 facilitates story imagining
- 2.1 research tool
- 2.2 analysis or idea generation tool
- 3.1 accompanying external narrative
- 3.2 structures user experience as narrative

NARRATIVE FUNCTIONS:
- 1: convey information
- 2: evoke reflectivity
- 3: show/teach values
- 4: empathy and identification
- 5: imagination and creativity
- 6: increase memorability
- 7: delighting
- 8: persuading (incl. lying)
- 9: cohesion and comprehension

Sketches W1

drastic
change of
sound when boils

- calm to scream
- distressing hum to
pleasant-tuned
whistle

D2   D5: change

W1A
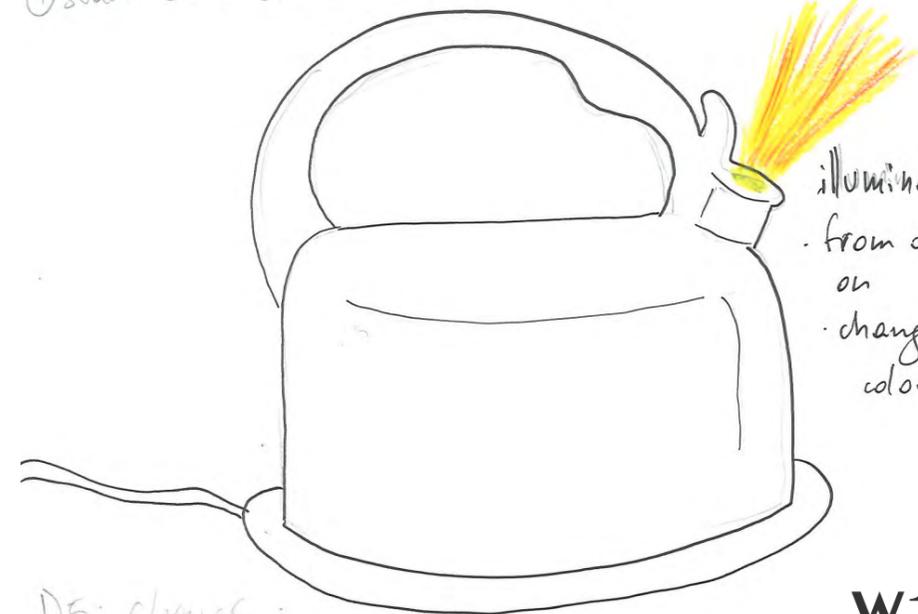
illuminating
- from off to
on
- change
colour.

D5: change

W1B

①   W
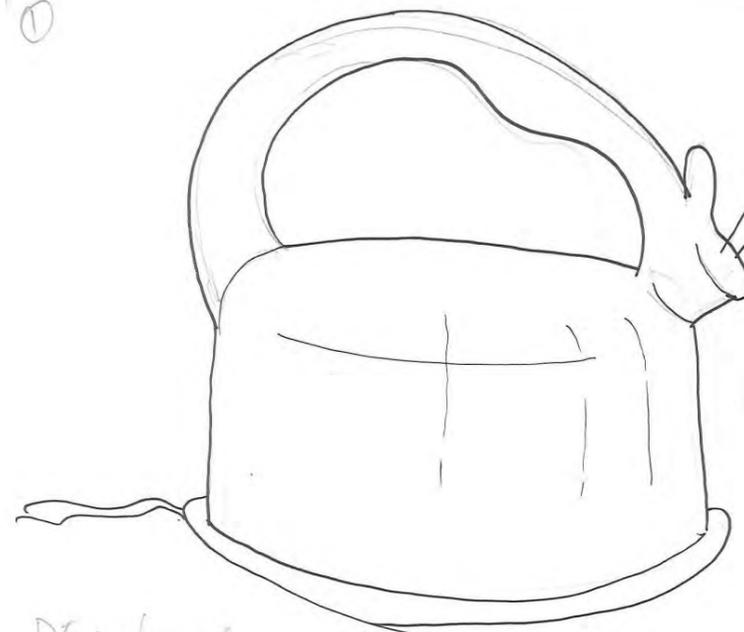
projections
- (either on
then off
- or viceversa
- or change
pattern/colour

D5: change

W1C

①   W
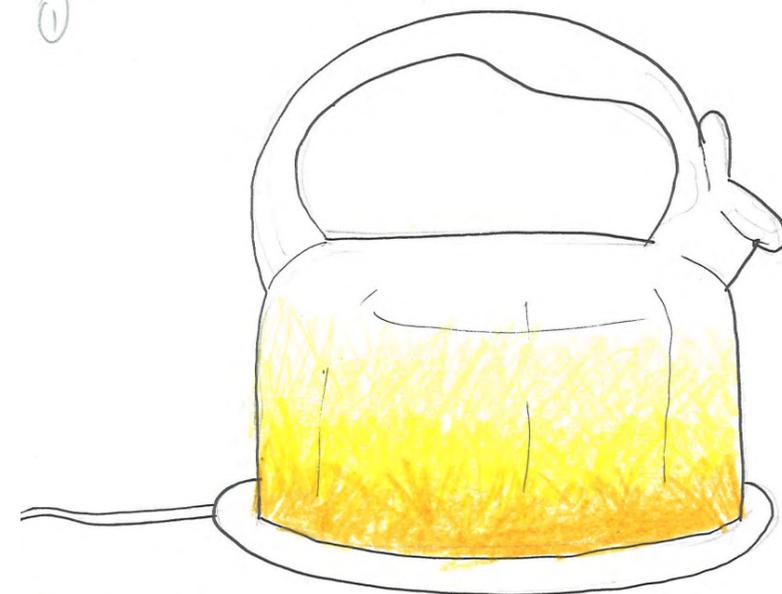
light:
- glow
as
boils
- change
colour of
glow.

D5: change

W1D

187

Sketches W1

glow in
pattern
when boil

add: *motivation*

W1E

rumble
whole kettle
shakes
when
boiling

with or
without
a base
wibble

W1F

underwater
scene
printed
inside
kettle

limescale
decorations?

(spray
put something
that limescale
sticks on w/
stencil on inside)

W1G
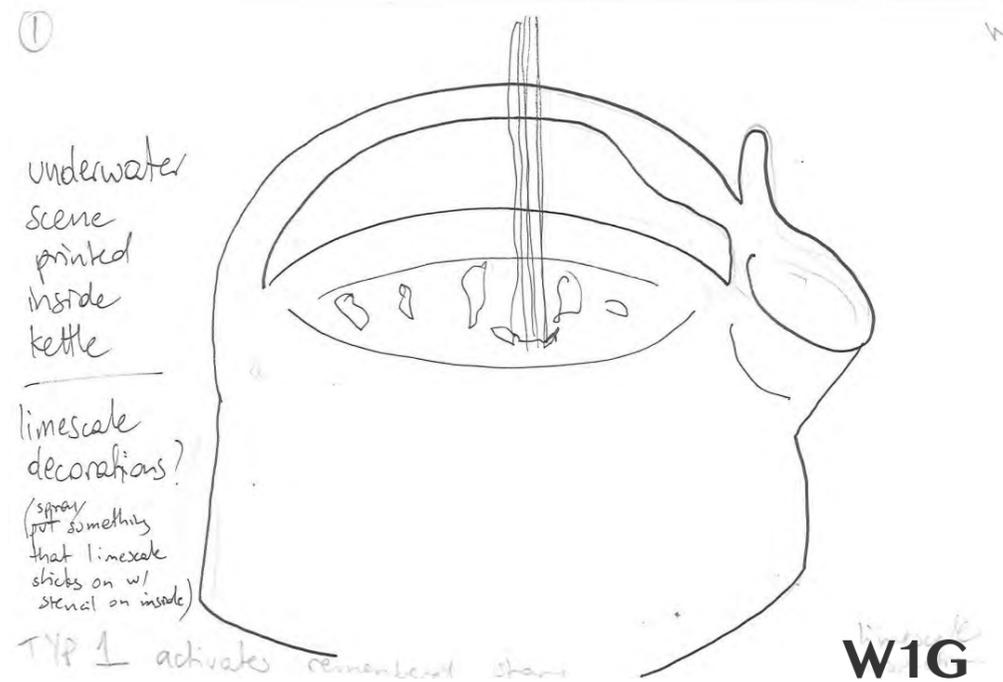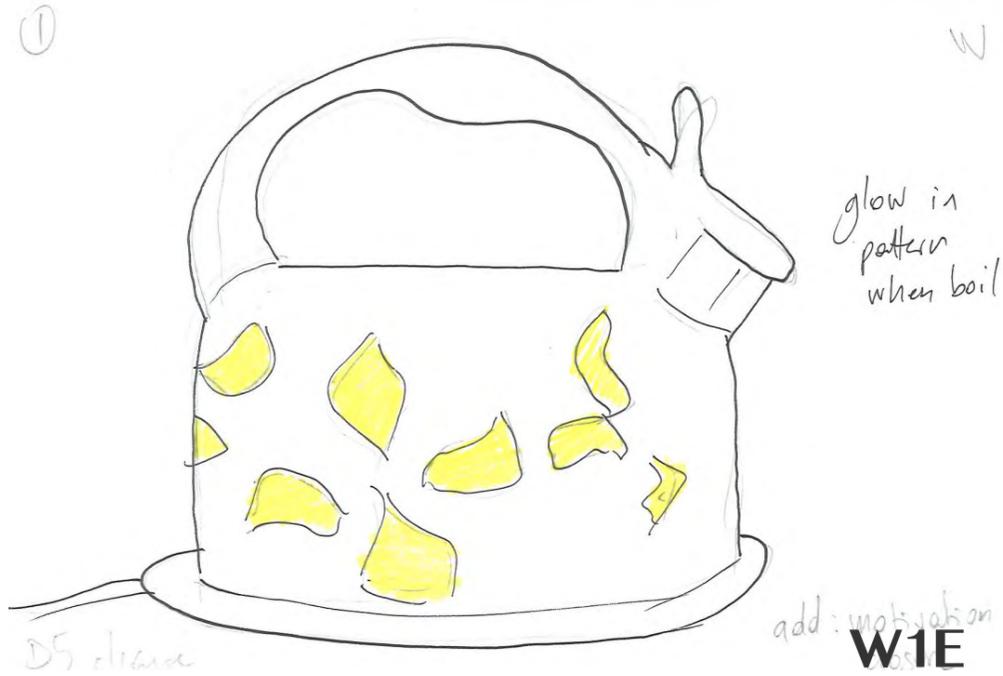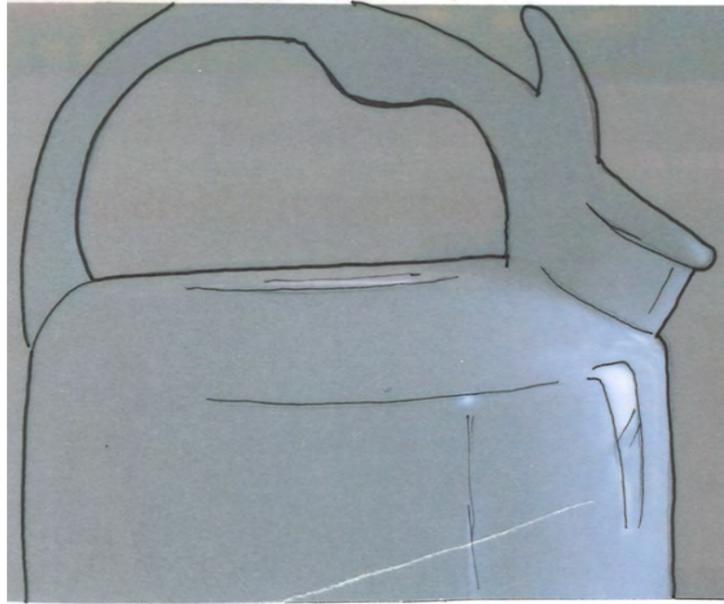
Selected for development

W1G - Kettle with underwater scene

This was then developed looking closely at the timing of the micro-events in the interaction (Toolkit 2)

W1Ga
variations on the W1G kettle

D5

D4   underwater scene on the inside of the
            kettle (limescale? etched?)
            D4 affect and value
D3   NF2 reflect; NF5; creativity
            T1.2 in-the-moment story imagining

D2

D1

None

MICRO-EVENTS:

see kettle
lift off base
carry to sink
open top
limescale inspection
empty out water
rinse out
fill kettle
fill from lid
fill from top
close top
carry to base
replace on base
190
turn on
turn on repeatedly/
double check
observe light change
wait for boil
do something else
check on kettle
boil
click
steam
noise
whistle
run to kettle
turn off
lift kettle off base
pour water
replace onto base

W1Ga
variations on the W1G kettle

D5

D4

over water scene -
etched on the outisde
of the kettle
D2 characters, entity
NF7 delight; NF5
creativity
T1.1 activates
associated stories

underwater scene on the inside of the
kettle
D4 affect and value
NF2 reflect; NF5 creativity; NF9 cohesion
T3.2 structure experience over time

D3

D2

D1

None

MICRO-EVENTS:

| see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base |

191

W1Ga
variations on the W1G kettle

over water scene on the outside of the kettle changes with boiling
D5 conflict, climax
NF2 reflect; NF5 creativity; NF9 cohesion; NF3 values (climate change)
T3.2 structure experience over time

check inside - also changed
D5 conflict, climax, closure
NF2 reflect; NF5 creativity; NF9 cohesion; NF3 values (climate change)
T3.2 structure experience over time

D5

suspense - will it change inside too?

D4

over water scene - etched on the outisde of the kettle
D2 characters, entity
NF7 delight; NF5 creativity
T1.1 activates associated stories

underwater scene on the inside of the kettle
D4 affect and value
NF2 reflect; NF5 creativity; NF9 cohesion
T3.2 structure experience over time

D3

D2

D1

None

MICRO-EVENTS:

see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base

488

W1Gb
variations on the W1G kettle

Fish swim
D5 conflict, climax, closure
NF7 delight; NF9 cohesion;
NF4 empathy
T3.2 structure over time
T1.2 in the moment story
imagining

D5

See fish, fish float when filled

D4   there are things in the
        kettle (expectation)

D3

D2

D1

None

MICRO-EVENTS:

see kettle | lift off base | carry to sink | open top | limescale inspection | empty out water | rinse out | fill kettle | fill from lid | fill from top | close top | carry to base | replace on base | turn on | turn on repeatedly/ double check | observe light change | wait for boil | do something else | check on kettle | boil | click | steam | noise | whistle | run to kettle | turn off | lift kettle off base | pour water | replace onto base

Kettle aesthetics - variables
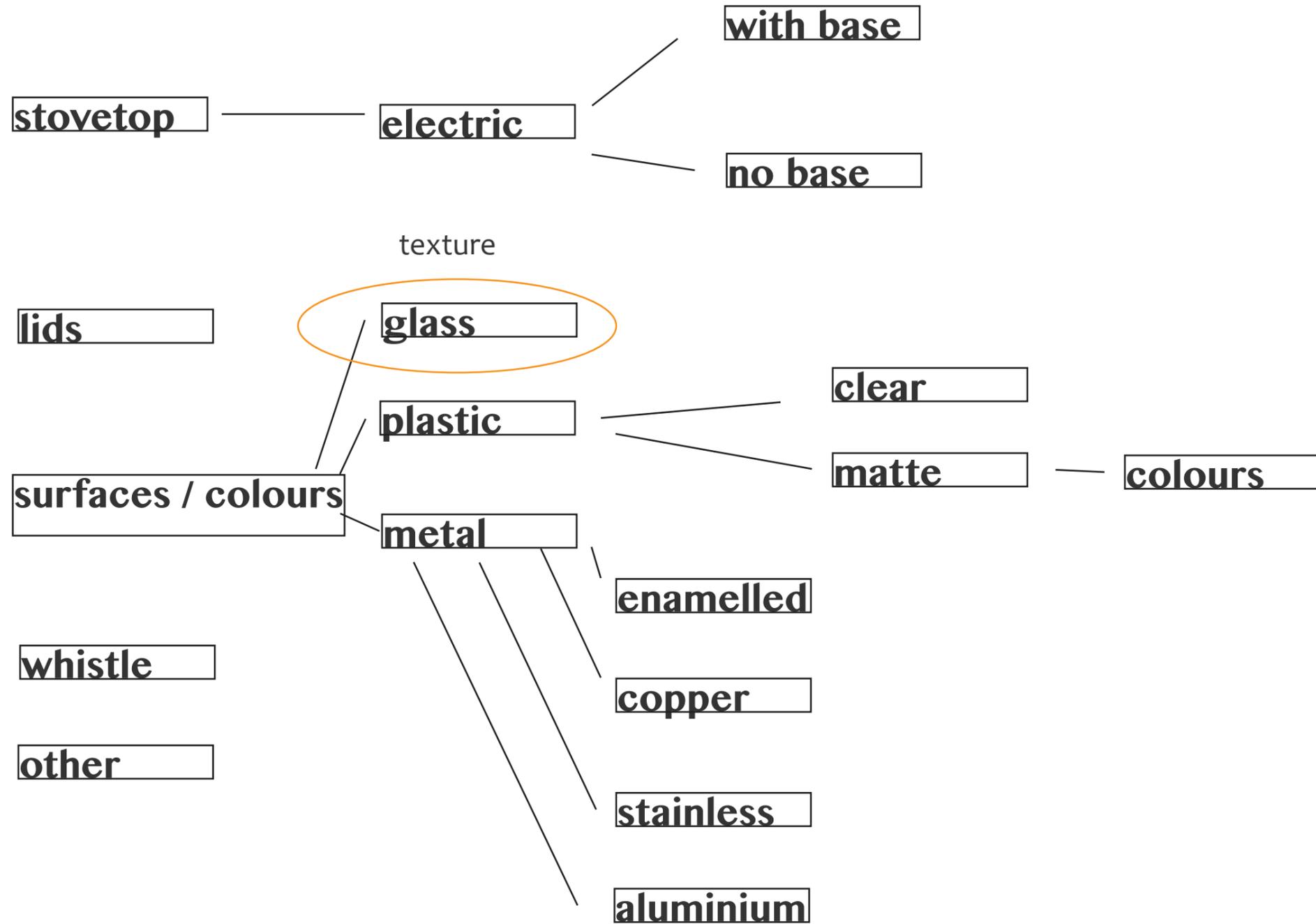
with base

stovetop ——— electric

no base

texture

lids

glass

clear

plastic

matte ——— colours

surfaces / colours

metal

enamelled

whistle

copper

other

stainless

aluminium

Kettle aesthetics - taxonomy overall form

rounded

angular

squat

Kettle aesthetics - taxonomy handle

rounded

straight

top

Kettle aesthetics - taxonomy spout

short

shaped

straight

long

Selected Kettle to modify

source image: https://i.ebayimg.com/images/g/gPQAAOSwg3FUdwcf/s-l500.jpg

Type of Kettle

The type of kettle was chosen because it had a rounded glass section for the water which could resemble a fish bowl, had blue light and a modern, technological feel, to resemble a fish tank.

Fish

Video + illustration of behaviour

Kettle 4 design process

Briefs for Vera Drake

Brief 1 (VD1)

Kettle as a dangerous object to be concealed

Brief 2 (VD2)

Kettle as a device for showing the user as a caring character

Matrix plot

DEFINITIONS:

- D1: Minimal
  - events
  - representation
- D2: Sequenced
  - structured progr
  - chronology
  - charact/ entity
- D3: Logically Sequenced
  - cause/effect
  - agency
- D4: Value laden
  - affect
  - value
- D5: Entertainment
  - conflict
  - climax
  - change
  - coherence
  - equilibrium
  - closure
  - not fully predict.
  - hero
  - antagonist
  - motivation

TYPOLOGY:

- 1.1 activates stories (associated or remembered)
- 1.2 facilitates story imagining
- 2.1 research tool
- 2.2 analysis or idea generation tool
- 3.1 accompanying external narrative
- 3.2 structures user experience as narrative

NARRATIVE FUNCTIONS:

- 1: convey information
- 2: evoke reflectivity
- 3: show/teach values
- 4: empathy and identification
- 5: imagination and creativity
- 6: increase memorability
- 7: delighting
- 8: persuading (incl. lying)
- 9: cohesion and comprehension

MICRO-EVENTS:

- see kettle
- lift off base
- carry to sink
- open top
- limescale inspection
- empty out water
- rinse out
- fill kettle
- fill from lid
- fill from top
- close top
- carry to base
- replace on base
- turn on
- turn on repeatedly/ double check
- observe light change
- wait for boil
- do something else
- check on kettle
- boil
- click
- steam
- noise
- whistle
- run to kettle
- turn off
- lift kettle off base
- pour water
- replace onto base

VD 1abcd VD2be
VD 1e
VD2ac
VD2d

204

Sketches VD1

VD1A

VD1B

kettle concealed by a
cloth.

VD1C

CAUTION

H&S gone mad.
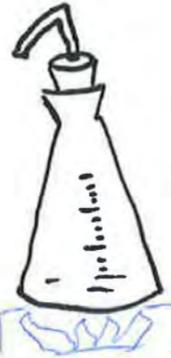
VD1D

Dangerous contents

VD1E
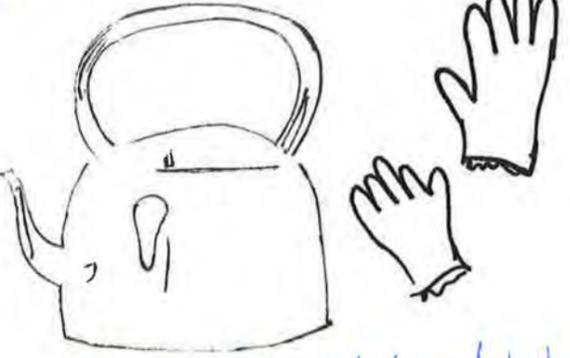
comes with welding/style
gloves.

Sketches VD2

VD2A

the gauge shows how many
aps by putting cheesy care
related sayings.

VD2A

VD2B

hands
holding
= handle
(symbol of
caring)

see kettle - affect/value

VD2B

VD2C

similar to VD2A
it could illuminate red.

VD2C

VD2D

Kettle comes with cleaning implements
you care for the kettle – also you
want the best for people you make
tea for. No limescale!

VD2D

VD2E

follows from VD2B

VD2E

Selected for development

VD1 and VD2 in combination - A kettle that signals itself as a dangerous object, but then reveals itself as caring.

This was then developed looking closely at the timing of the micro-events in the interaction (Toolkit 2)

VD1 / VD2 variations
VD1Ea

D5

See Concealed kettle
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

see kettle

lift off base

carry to sink

open top

limescale inspection

empty out water

rinse out

fill kettle

fill from lid

fill from top

close top

carry to base

replace on base
208

turn on

turn on repeatedly/
double check

observe light change

wait for boil

do something else

check on kettle

boil

click

steam

noise

whistle

run to kettle

turn off

lift kettle off base

pour water

replace onto base

VD1 / VD2 variations
VD1Eb

Hot On Button
agency, NF2 reflection, NF9 cohesion
T3.1 structures user experience

D5

See Concealed kettle
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

see kettle

lift off base

carry to sink

open top

limescale inspection

empty out water

rinse out

fill kettle

fill from lid

fill from top

close top

carry to base

replace on base
209

turn on

turn on repeatedly/
double check

observe light change

wait for boil

do something else

check on kettle

boil

click

steam

noise

whistle

run to kettle

turn off

lift kettle off base

pour water

replace onto base

VD1 / VD2 variations
VD1Ec

VDIE C

welding glove

As it boils the pattern turns into
caring pattern
agency, NF2 reflection, NF9 cohesion,
NF7 delight
T3.1 structures user experience

as it boils it
goes back to
normal

as it boils a
caring pattern is
revealed

D5

See kettle - warns of danger
T1.1 associated stories
NF3 Values

D4

D3

D2

D1

None

MICRO-EVENTS:

| see kettle	lift off base	carry to sink	open top	limescale inspection	empty out water	rinse out	fill kettle	fill from lid	fill from top	close top	carry to base	replace on base	turn on	turn on repeatedly/ double check	observe light change	wait for boil	do something else	check on kettle	boil	click	steam	noise	whistle	run to kettle	turn off	lift kettle off base	pour water	replace onto base

Selected for development

Kettle with red caution stripes. When it gets warm a caring pattern is revealed.
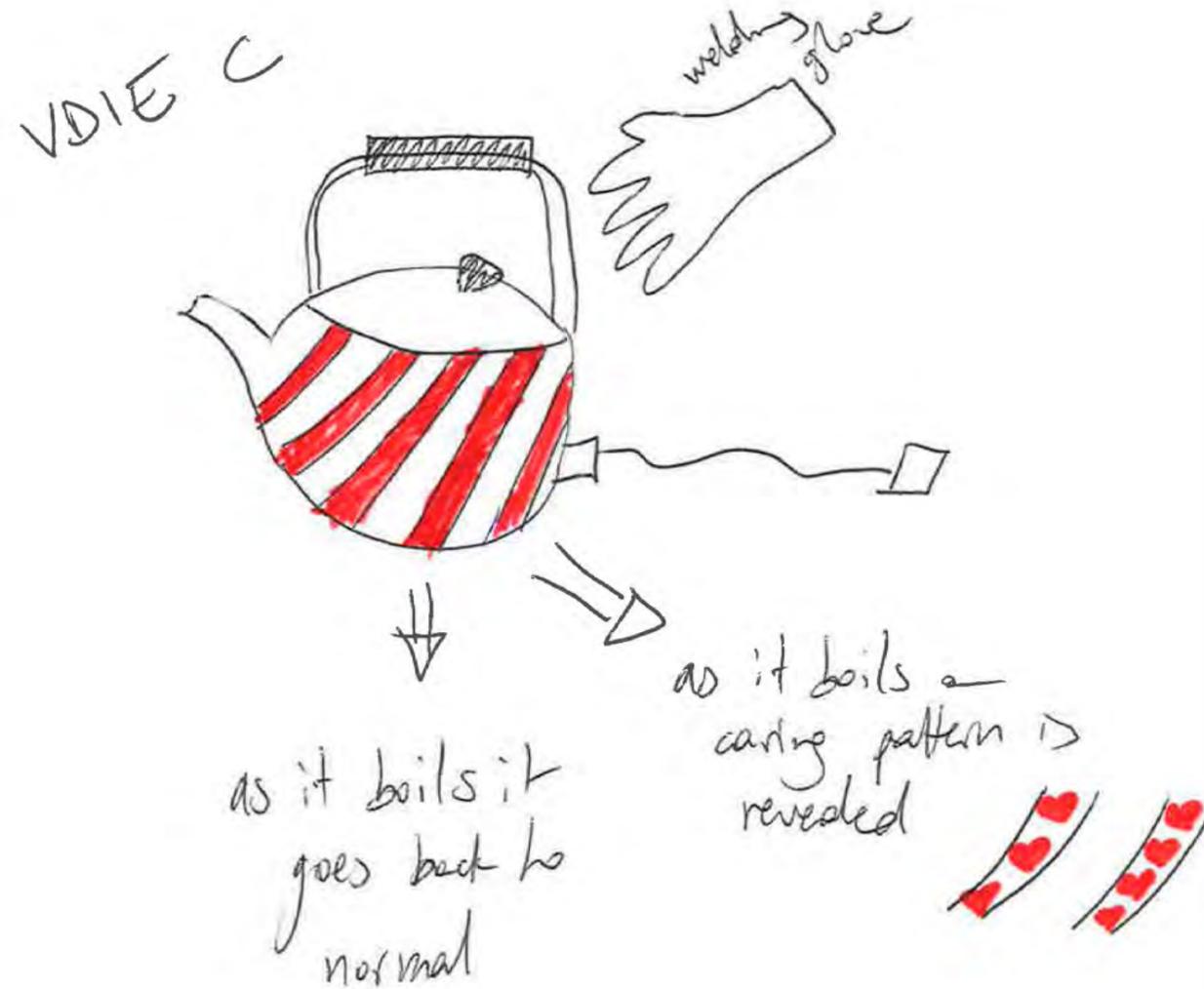
VDIE C

welding glove

as it boils it goes back to normal

as it boils a caring pattern is revealed

Kettle aesthetics - variables
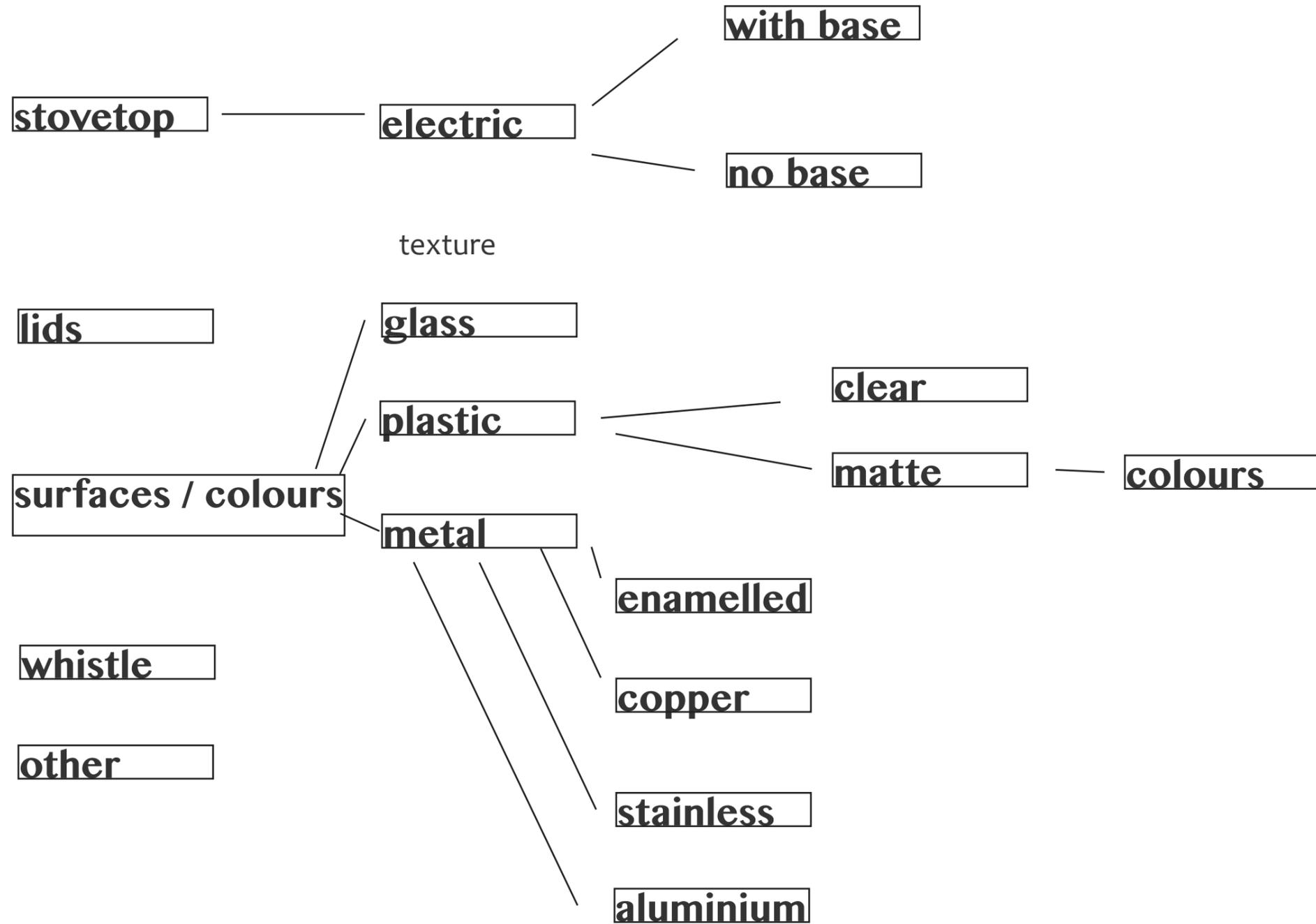
stovetop — **electric** — **with base**

electric — **no base**

texture

lids

glass

plastic — **clear**

plastic — **matte** — **colours**

surfaces / colours

metal — **enamelled**

metal — **copper**

whistle

metal — **stainless**

other

metal — **aluminium**

Kettle aesthetics - taxonomy overall form

rounded

angular

squat

Kettle aesthetics - taxonomy handle

rounded

straight

top

214

Kettle aesthetics - taxonomy spout

short

shaped
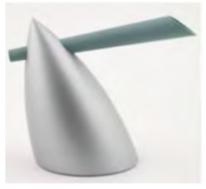
straight

long

Selected Kettle to modify

Pattern experiments
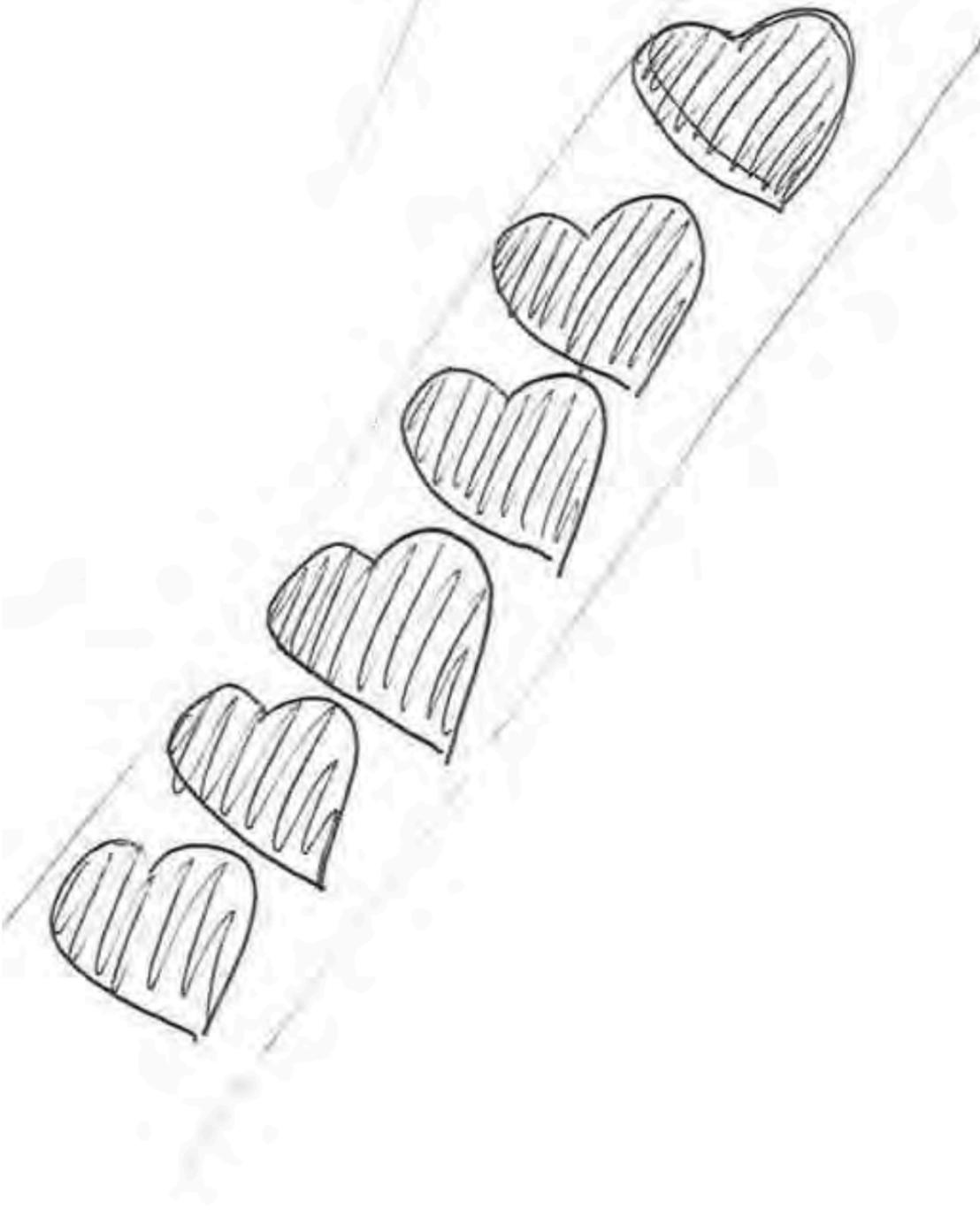
Pattern experiments

Final pattern for transfer
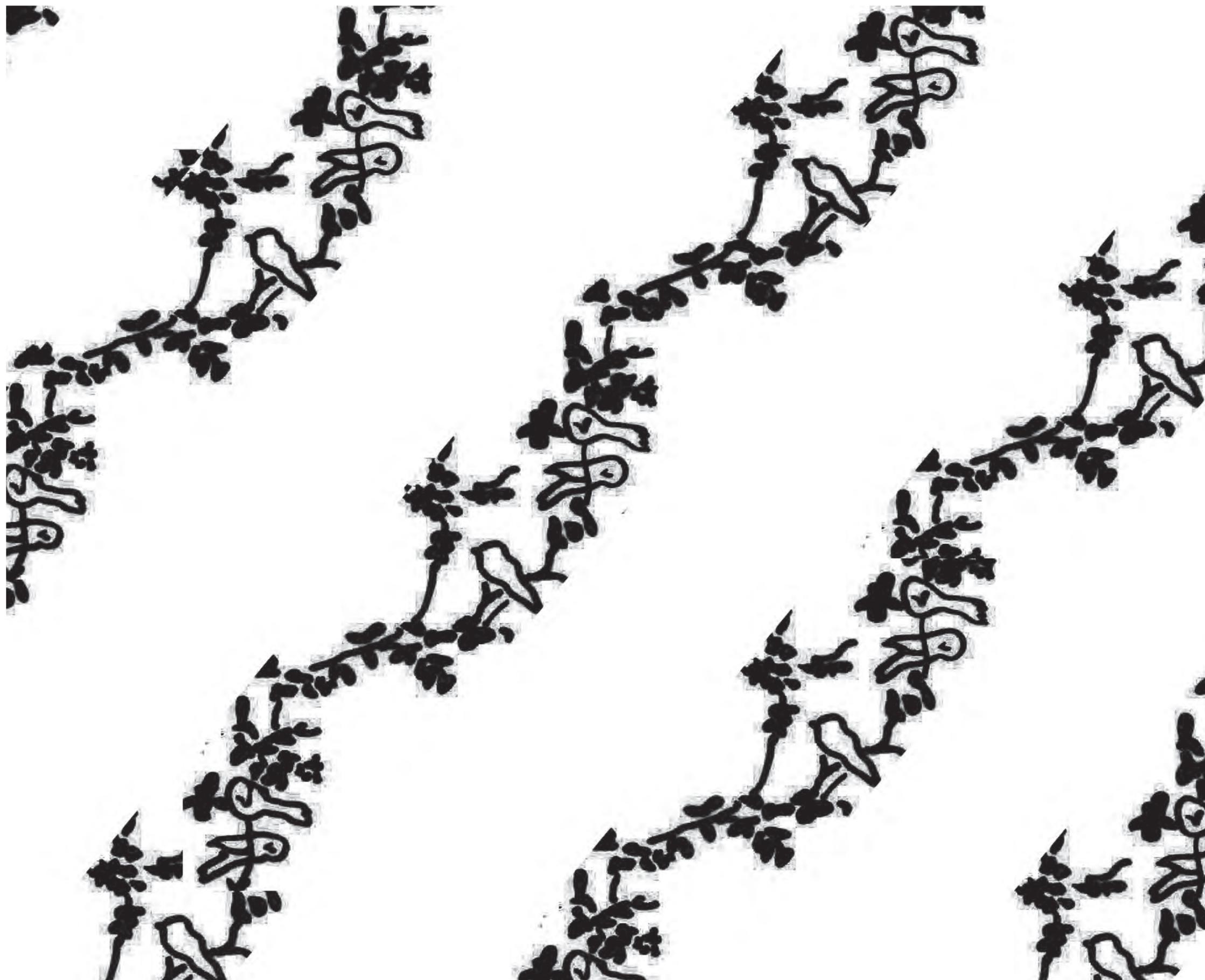
Video + illustration of behaviour

Appendix 16: Jordan, P. W., Bardill, A., Herd, K., Grimaldi, S. (2017) 'Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative', The Design Journal, 20(sup1), pp. S4292–S4306. doi: 10.1080/14606925.2017.1352926. (Peer Reviewed)

Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative

Patrick W. Jordan, Andy Bardill, Kate Herd & Silvia Grimaldi

Published online: 06 Sep 2017.

Submit your article to this journal ☍

Article views: 152

View Crossmark data ☍

Design for Subjective Wellbeing: Towards a Design Framework for Constructing Narrative

Patrick W. Jordan[a*], Andy Bardill[a], Kate Herd[a], Silvia Grimaldi[b]

[a]Middlesex University
[b]London College of Communication, University of the Arts London
*Corresponding author e-mail: p.jordan@mdx.ac.uk

Abstract: We explore the role that interaction with products and services can play in the narratives that we develop about ourselves. We propose a four-level model, which seeks to explain this and use it as the basis for analyzing eight immersion studies. In each, we investigate the role that products and services play in shaping narratives, which in turn reflect our self-identity. We also look at archetypes – the various ideals that we can have about ourselves – and at how the alignment of narratives with these enhances our wellbeing. The model offers the potential to link narrative to design features and to identify new market opportunities. However, we recognize there may be challenges in enabling people to articulate narrative and identify their ideal archetype.

Keywords: Narrative, Happiness, Archetype, Immersive Study, Design

1. Aims of the study

"We have, each of us, a life-story, an inner narrative—whose continuity, whose sense, is our lives. It might be said that each of us constructs and lives, a 'narrative', and that this narrative is us, our identities[…]. Each of us is a singular narrative, which is constructed, continually, unconsciously, by, through, and in us—through our perceptions, our feelings, our thoughts, our actions; and, not least, our discourse, our spoken narrations" (Sacks, 1998 pp. 110-111)

Narratives are central to the way humans understand our identity and our sense of self, and there is evidence to suggest that having a clear and positive narrative about our life, consistent with our values and aspirations, enhances our psychological wellbeing (Dolan, 2014; Jordan, 2000). We posit that products and services that support life narrative will enhance subjective wellbeing and contribute to happiness. Consequently products and services are likely to provide stronger relationships between owner and 'thing' and have longer, richer cycles of ownership. In the current

climate this can be seen as an economical, environmental and psychological imperative. Through this study we aimed to develop a design framework that could be usefully used to design products and services that work in positive symbiosis with owners' life narratives.

1.1 Method

We structured this work as a series of on going designerly conversations within our working group and with products that we own. Through a conversational workshop, we elicited four narrative types that appeared to relate to products and services and organised these into a hierarchy. These levels being:

- Life narrative
- Story narrative
- Incident narrative
- Thing narrative

We went on to explore this notion further by writing individual immersion studies focussing on our ownership and use of two products: a car; a domestic appliance. At the outset we considered that these might be, in turn, a high and a low interest product but this did not subsequently bear out. We left the immersion studies unconstrained with the consequence that some were written closer to pre-analysed lists of facts, and others with clear narrative threads in the unfolding story.

We analysed these immersion studies through a second conversational workshop. The text was mapped against the four narrative levels and, through this process, we began to explore how designed features might enhance the various narrative levels. However, it became increasingly apparent, as we added to or modified the design of our products through conversation and thought experiments, that life narrative is the overarching focus. Designing 'things' and 'incidents', understanding the operating agency and causality that will sculpt these into 'stories', has to be driven by the life narrative if it is to lead to a product that enhances subjective wellbeing for that individual.

To explore how design might operate in the four narrative levels, and to ground this work in theory, we mapped them against Jordan's four pleasures (2000) and Grimaldi et al's (2013) narrative definitions.

As the focus on the individual emerged, we sought a way to characterise individuals and their life narrative that would contribute to our framework. In design practice, this is typically done by creating personas, but this does not necessarily provide a full range of life narratives. However, Jungian archetypes (Mark and Pearson, 2001) appeared to provide this characterisation.

1.2 Context for the work

People's life stories are so tied into their identity that neurological patients with damage in areas of the brain linked to narrative lose the sense of who they are (Bruner, 1991; Young and Saver, 2001). People constantly construct narratives from all the things in their lives, circumstances, events, facts, behaviours, people, objects, experiences and anything else that might come into someone's consciousness. Some of these narratives will be overlooked and forgotten, some will be throwaway anecdotes told over dinner about the present day, and some will become part of a repertoire of stories that are told and retold and are inextricable from people's identities. Collections of narratives

like these tend to become a representation of people's values and personalities, and often once someone dies these stories live on in the family as a symbol of that person's identity. Narrative is an appropriate medium for this as narratives are particularly good at presenting characters that we can empathise with (Bordwell, 1985; Briggs et al., 2012; Wright and McCarthy, 2008). The narrative that one person constructs can be very different from what another person constructs from the same situation. These narratives will depend on a wide variety of personal and social factors including perception, attention, values, personality, culture, experience, intelligence and mood. They will also depend on how well these narratives fit with their life narrative and the identity they embody or want to portray (Csikszentmihalyi and Halton, 1981).

Material anthropology has been studying the role objects have within life narratives and how people's identity and personality is tied into the narratives around their 'things' (Miller, 2008). What is the role of products and services in life narratives? Why do some products and services feature in life narratives while others are disregarded or treated as marginal figures? Why do we gel and form a relationship with certain products and services that seem to embody our life narratives, while other products and services take more of a background role and could easily be substituted?

An extensive overview of the use of narrative and stories in design are provided in McCarthy and Wright's Experience Centred Design (McCarthy and Wright, 2010) and Grimaldi et al.'s Narratives in Design (Grimaldi et al., 2013). This paper focuses on an aspect that is not central to these overviews, the ways in which certain users' character traits may make it more or less likely for them to incorporate a particular product into meaningful life narratives.

2. The outcomes from the study

2.1 The four narrative levels

- **Life narrative**. A narrative about a person's life as a whole. Aspects of the narrative will focus on product features and product manifestations that range from aesthetics to ethics. Reflective responses to these factors will change over time. Interactions with, and ownership of, products and services can enhance or diminish a person's life narrative.
- **Story narrative**. The interaction with a series of products or services that enable an individual to build a story around a sequence of events connected by causality or agency. Story narratives enable articulation of a life narrative to ourselves and our social and familial connections. Collecting and recounting these stories reinforces life narrative and enhances subjective wellbeing.
- **Incident narrative**. A narrative around a single event or incident. Incident narratives operate in the same way as story narratives, reinforcing life narrative, but focusing on individual interactions or events.
- **Thing narrative**. A narrative about the physical properties and manifestation of a product or service. These physical properties can operate at both a visceral and reflective level depending upon their relevance to the life narrative.

Table 1. Mapping the Four Narrative Levels.

Definitions of Narrative (Grimaldi et al., 2013)	Representation of Events	Chronological	Characters	Causality or Agency	Values and Emotions	Conflicts and Climax	The Four Pleasures (Jordan, 2000)	The Four Narrative Levels
D5 Entertainment Value	●	●	●	●	●	●	Ideo Pleasure	Life Narrative
D4 Value-Laden Narrative	●	●	●	●	●			
D3 Logically Sequenced Narrative	●	●	●	●			Socio Pleasure	Story Narrative
D2 Sequenced Narrative	●	●	●				Psycho Pleasure	Incident Narrative
D1 Minimum Definition	●						Physio Pleasure	Thing Narrative

2.2 The Immersion Studies

We present a short synopsis and subsequent analysis of the immersion studies. We recognise that although these provide a good depth of insight into aspects of product ownership and use that relate to our narrative levels, they lack the necessary richness to reveal a comprehensive life narrative.

2.2.1 Study 1: KH

Female, age 39. Married with two children aged 3 and 8 months. Lives in Hertfordshire. The two product choices are low interest items in her life.

Figure 1. Domestic Appliance [left] (Hotpoint WML520P, n.d.); Car [right] (netcarshow.com, 2008) .

Domestic Appliance: Hotpoint Washing Machine

Having bought a new house and moved out of rented accommodation, she and her husband had to buy white goods for the kitchen and the smallest portion of the budget was assigned to the washing machine. She chose to buy a Hotpoint as it was a brand that she knew, that she expected to be reliable, and online reviews considered it a good value model. She has had the machine for 5 years and it has operated problem-free but she is already pricing new ones as she feels that it may not last much longer.

She uses only three settings on the machine and finds the difference between them negligible. She has become less satisfied with the machine over time, noticing issues of design quality such as the powder drawers difficult to clean as they can't be removed. Recently her son got his finger caught in the closing mechanism of the door. This suddenly made the machine highly conspicuous to her, having previously been something that she hardly thought about or noticed.

Car: Renault Clio Sport Tourer

She is not interested in cars, nor the perceived status associated with them. This is the fourth car she has owned and the one that she is least interested in. It was a functional purchase - she needed a car with 5 doors because of her growing family and she needed enough space in the back for her biggest dog. She was offered the car at a good price and knew some people at the dealership, so she trusted them with the purchase.

The car is not a common model, which she likes. It gives good fuel economy. She has subscribed to a monthly payment plan that gives her a fixed fee for the annual service and MOT at the dealership. Reliability is important to her and she is concerned that now that the car has done 60,000 miles issues might arise here.

Table 2. KH: Immersion studies

Narrative Level	Domestic Appliance	Car
Life Narrative	She focuses on reliability value balanced against value for money. She values her family above material possessions.	
Story Narrative	The washing machine had performed well for years without being noticed but suddenly came to the forefront of her attention when her son got his finger stuck in the closing mechanism.	The decision to get this car came about as a result of her expanding family and it has served them well so far.
Incident Narrative	Her son got his fingers stuck in the closing mechanism.	She became pregnant with her first child and needed a bigger car with 5 doors and large boot to accommodate her family.
Thing Narrative	The washing machine is reliable, value for money, and inconspicuous.	The car is big enough to fit her family and dogs into. It is economical.

2.2.2   Study 2: PJ

Male, aged 49, lives alone. Divides time between home in Somerset and club in London. Has a 10 year-old son. Very interested in cars.
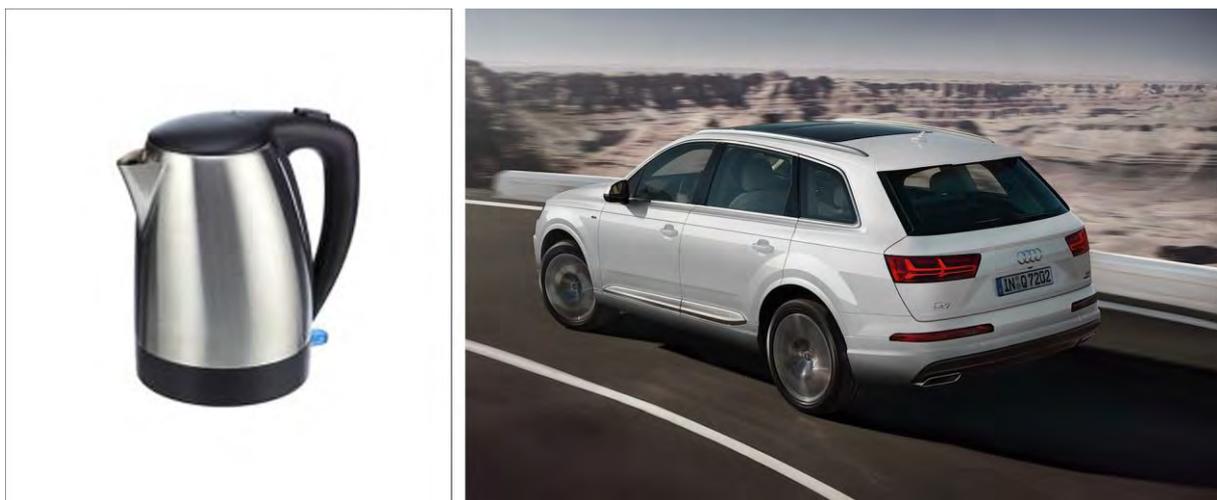

Figure 2. Domestic Appliance [left]; Car [right] (Mihnea, 2015) .

Domestic Appliance: Sainsbury's Kettle

His old kettle stopped working and he needed a new one. This was a low interest product for him, so he wasn't willing to shop around and instead just chose from the selection in the supermarket when

he was doing his weekly shop. He chose what he thought was the most attractive one in the shop. It was a brushed metal one, which he thought looked sophisticated. It didn't worry him that it was comparatively expensive.

He has had the product for about 10 years now and it works fine. It is quite noisy which annoys him, but boils the water quickly which he likes.

Car: Audi Q7

He had previously owned a Range Rover Sport Supercharger that was a cartoonishly excessive vehicle and only did 15 miles to the gallon. It became unreliable so he decided to sell it and get a new car, buying the Audi Q7 on lease-hire. He went through a systematic buying process, choosing the Q7 because he wanted a reliable SUV from a prestigious brand. He enjoyed the buying process and included his then 8 year-old son in it.

He didn't enjoy the car as much as he hoped. The 'newness' soon wore off and the size of the car made it difficult to park, which made him feel embarrassed in front of his girlfriend. He also found that the car attracted less interest that his previous one when he talked about cars in the pub, because it was not as 'excessive'. The car was reliable and served him well, but he never grew attached to it.

Table 3. PJ: Immersion studies

Narrative Level	Domestic Appliance	Car
Life Narrative	He is a high-status person with good taste	He is someone who likes life to be full of 'excessive' things that can be talking points.
Story Narrative	When he buys things he puts quality and design before cost.	The car served him well for 2 years and took him and his son on many adventures, however it was too boring for him to bond with.
Incident Narrative	He bought it because it was the nicest one in the shop, without regards to the cost.	The car did not get as much interest in pub conversations as the previous one had.
Thing Narrative	The kettle is nice looking and comparatively expensive.	The car is a very large, high-status SUV

2.2.3   Study 3: SG

Female, age 38, lives in London with two children, 9 and 2 years old. She hasn't ever owned a car so the car had to be a family car.

Figure 3. Domestic Appliance [left] (author's own image); Car [right] (autobelle.it, 2016)

Domestic Appliance: Kettle (brand unknown)

She doesn't remember why she bought this particular kettle, other than it was cheap and made of metal, which she preferred to plastic. She thought that it looked OK and it worked well. While she was away her husband threw out the kettle and replaced it with one that he said was faster. She thought it was a waste of money and doesn't notice any difference in speed, however she thinks the new kettle also looks OK.

Car: Bianchina Panoramica

The car belonged to her mother, but she was allowed to use it when she was a teenager after she passed her driving test. The car was very small and was associated with an unlucky comedy character; that he owned one was used to demonstrate how badly his life had turned out. The low social status of the car made it cool in the eyes of the 'punky' friends who she hung out with, and it became central to her social life. She would often take people to gigs in it and had friends crammed into it after a night out, coming back to her apartment to sleep over.

Table 4. SG: Immersion studies

Narrative Level	Domestic Appliance	Car
Life Narrative	She is a prudent and financially responsible person.	She is someone who lives an alterative lifestyle
Story Narrative	The kettle has worked well for many years and there was no need to replace it.	The car has taken her and her friends on many trips to see cool, alternative gigs.
Incident Narrative	She chose the kettle over the alternatives because it was made of metal and they were plastic.	People within her 'punky' peer group find the low status of the car to be an appealing quality.
Thing Narrative	The kettle is cheap and looks good.	The car is low-social status.

2.2.4   Study 4: AB

Male, age 52. Married with two children aged 12 and 15. Lives in London. Is an inveterate fixer of things.

Figure 4. Car (author's own image) . No image of the washing machine was available.

Domestic Appliance: Zanussi Washing Machine

When he moved into a new flat with his girlfriend, he took a neighbour's discarded Zanussi washing machine that he had previously worked with his father to repair. Their flat did not have ready-made attachment points for washing machines, so he took pride in creating his own solution. He and his girlfriend watched the first wash together, an incident his best man mentioned at his wedding. They owned it for 6 years before the controller board broke, after which they bought another Zanussi. The machine worked reasonably well for 8 years, although he had to carry out a series of minor repairs during this time. Then the drum bearing went. When he went to buy a replacement part he was advised that he couldn't fix it. However, after a lot of effort he did, and it lasted a further 12 months.

After this, he and his girlfriend bought a Bosch. He didn't like it at first – regarding features like the screen as being indicative of needless complexity. However, he developed respect for it as it performed well over 11 years. Recently it developed a major fault which took a lot of work to diagnose and repair. However, again he succeeded, and he plans to keep repairing the machine indefinitely using parts bought from eBay, something not possible during the time he had the Zanussis.

Car: Mitsubishi Pajero

When he was younger he had had a variety of interesting, although not always reliable cars. Since starting a family he had had 'sensible but boring' cars, most recently a Fiat Punto. The car was continually getting bumped and scraped, so he decided to replace it with something more sturdy.

Initially he considered a Land Rover, but then discovered the Mitsubishi Pajero, which he felt offered a combination of ruggedness and comfort. He found one that was in good condition, and went with the whole family to go and collect it. He bonded with it immediately as he drove it home in torrential rain. The car has taken him and his family on some great trips both in the UK and France, and travelling in it always creates a sense of adventure. The whole family has bonded with it – they call 'her' Old Betsy.

Eventually the car started to have major problems, including a cracked cylinder head. He thought about getting rid of the car but his son wanted him to repair it so he set out to do so, getting lots of attention from the neighbours as he worked on it. He was successful and at the moment when he first started it up again, a neighbour cheered from her window, while another ran across the street to see.

Table 5. AB: Immersion studies

Narrative Level	Domestic Appliance	Car
Life Narrative	He is adept at repairing things and surprises others with his ability and tenacity in this area. In doing so he is carrying on a family tradition.	
Story Narrative	He has continually repaired the machine and got it working again against the heaviest odds. He has done this with many other products throughout his lifetime, just as his father had done.	After many great family adventures the car developed a major fault. He fixed it to the surprise and pleasure of his family and neighbours.
Incident Narrative	He worked with his father to repair the machine.	He bonded with it as soon as he drove it home.
Thing Narrative	The washing machine wasn't working when he took possession of it.	The car is rugged and comfortable, with a sense of adventure.

2.3 Jungian Archetypes: exploring idealised personality traits

A person's wellbeing is likely to be influenced by the degree to which their life narrative matches their ideal view of themselves (Dolan, 2014). Jung developed personality archetypes by which people define themselves. These have been summarised and updated by a number of sources in the fields of branding and marketing such as Mark and Pearson (2001). We used these archetypes as a convenient framework to identify the personality traits emerging from these immersion studies, and in what ways the products studied resonated with the idealised personality traits of the person recounting the narrative.
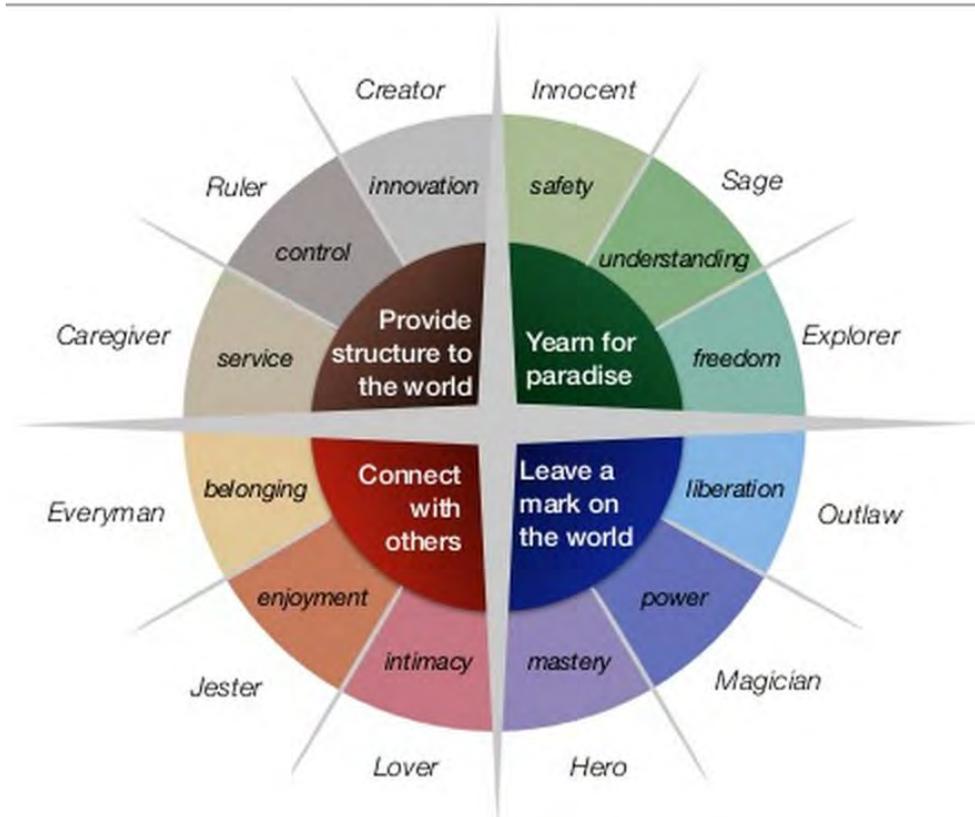
Figure 5. Universal human desires and their associated archetypes. (Hean, 2014)

Table 6. Jungian Archetypes (adapted from Mark and Pearson 2001)

Archetype	Goal	Strategy
Innocent	Safety and happiness	Doing things in the right way
Sage	Truth and wisdom	Seek information and reflect
Explorer	Authenticity	Exploring the world and exploring new things
Outlaw	Disrupt and shock	Challenge what is wrong in society
Magician	Make dreams come true	Develop vision and live it
Hero	Courage and mastery	Develop strength and competence
Lover	Intimacy and sensual pleasure	Become more attractive in every way
Jester	Have fun and lighten the world	Play, joke and be funny
Everyman	Belong and fit in	Develop ordinary values and common touch
Caregiver	Help and protect others	Do things for others
Ruler	Safety and happiness	Take responsibility and exert leadership
Creator	Innovation and creativity	Use imagination, skill and creativity

Despite the limitations of the immersion studies, some clear character archetypes emerged in relation to these product choices. However, we shouldn't lose sight of the limitations as individuals have characters that are multifaceted, that may span ordinals or diagonals.

KH: Caregiver, Innocent.

PJ: Ruler, Jester

SG: Outlaw, Sage

AB: Hero

3. Discussion and Further Research

The four-level model offers the potential to understand how characteristics of a product can work their way up from the lowest 'thing' level through the 'incident' and 'story' levels until they potentially impact on a person's life narrative. This gives a lens for understanding why a product impacts positively or negatively on someone's wellbeing. When looked at in conjunction with the archetypes this enables us to form a deeper understanding of users and to understand why their experiences with products resonated with their personality. The table below identifies a property of each of the products in the case studies and its effect on the user's quality of experience.

Table 7. Product properties and their contribution to narrative

Product	Property	Contribution to Narrative
Washing Machine (KH)	Dangerous	Threatening her children's wellbeing
Car (KH)	Practicality	Taking care of her family
Kettle (PJ)	Sophisticated	Was able to show his good taste during the buying process
Car (PJ)	High-Status	Failed to contribute to the humorous narrative he enjoys with vehicles
Kettle (SG)	Cheap	Demonstrated frugality
Car (SG)	Low status	Didn't violate her and her friends' values
Washing Machine (AB)	Repairable (although not easily)	Was able to demonstrate prowess in repairing it
Car (AB)	Interesting	Formed a bond and kept it long-term

Strictly speaking, these are not actually properties of the products but of the interaction between the product and the person. For example, the Zanussi washing machine was repairable for AB, but that doesn't mean it would be repairable for the rest of us. Similarly, the Sainsbury's kettle was sophisticated in PJ's eyes, but that doesn't mean that others would have seen it in the same way. One avenue of future work is to look at whether there are common patterns linking properties and life narratives.

The emergent design framework from this study will enable us to ask and answer new design questions relating to a product or services contribution to subjective wellbeing. For example:

1. *Intelligent Guesses* - People who drive people carriers are innocent caregivers.
2. *Product Analysis* –Who are these products currently designed for? Jesters or Rulers?
3. *Identifying Gaps in the Market* – a particular brand might not have any products in its range for Jesters, for example.
4. *Innovation* – What does a 'Heroes' train service look like?

However, given the overriding importance of life narrative and the significance of personality traits it is clear that better approaches to eliciting them is needed. Furthermore, recognition that life narratives can be both real and/or ideal, emergent, overt and covert, is necessary. Are there effective ways to systematize personality traits to inform this framework? For example: do we all have elements of a different vision of paradise?; Do we all wish to leave a mark on the world but in different ways?; Are our connections with others differently characterized and do we wish to structure the world in different ways?; do we have one trait from each quadrant? Our ongoing work requires identifying appropriate methods to enable this.

References

Bianchina Panoramica 1970, 2016. Retrieved from http://www.autobelle.it/annunci/vendo_bianchina_panoramica_1970_vibo_valentia_187974.php

Bordwell, D., 1985. Narration in the Fiction Film. Univ of Wisconsin Press.

Briggs, P., Blythe, M., Vines, J., Lindsay, S., Dunphy, P., Nicholson, J., Green, D., Kitson, J., Monk, A., Olivier, P., 2012. Invisible design: exploring insights and ideas through ambiguous film scenarios, in: Proceedings of the Designing Interactive Systems Conference. pp. 534–543.

Bruner, J., 1991. The narrative construction of reality. Critical inquiry 18, 1–21.

Csikszentmihalyi, M., Halton, E., 1981. The Meaning of Things: Domestic Symbols and the Self. Cambridge University Press.

Dolan, P., 2014. Happiness by Design: Change What You Do, Not How You Think. Avery Pub Group, New York, New York.

Grimaldi, S., Fokkinga, S., Ocnarescu, I., 2013. Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice, in: Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces, DPPI '13. ACM, New York, NY, USA, pp. 201–210. doi:10.1145/2513506.2513528

Hean, E. (2014). Archetype Overview with brand examples & character compass. Retrieved from: http://www.slideshare.net/EmilyBennett/archetype-overview-from-the-hero-and-the-outlaw

Hotpoint WML520P, n.d. Retrieved from https://www.amazon.co.uk/Hotpoint-WML520P-Aquarius-Washing-Machine/dp/B0042U0IE2

Jordan, P.W., 2000. Designing Pleasurable Products: An Introduction to the New Human Factors. Taylor & Francis, London.

Mark, M., Pearson, C.S., 2001. The Hero and the Outlaw: Building Extraordinary Brands Through the Power of Archetypes. McGraw-Hill Professional, New York.

McCarthy, J., Wright, P., 2010. Experience-centered design designers, users, and communities in dialogue. Morgan & Claypool, [San Rafael, Calif.?].

Miller, D., 2008. The Comfort of Things, 1st Edition. ed. Polity Press.

Mihnea, R., 2015. Audi Shows 2015 Q7 in New Tofana White Color. Retrieved from http://www.autoevolution.com/news/audi-shows-2015-q7-in-new-tofana-white-color-reveals-obsession-with-mountains-91389.html

Netcarshow.com, 2008. Renault Clio Estate. Retrieved from https://www.netcarshow.com/renault/2008-clio_estate/1600x1200/wallpaper_08.htm

Sacks, O.W., 1998. The man who mistook his wife for a hat and other clinical tales. Simon & Schuster, New York.

Wright, P., McCarthy, J., 2008. Empathy and experience in HCI, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08. ACM, New York, NY, USA, pp. 637–646. doi:10.1145/1357054.1357156

Young, K., Saver, J.L., 2001. The neurology of narrative. SubStance 30, 72–84.

About the Authors:

Patrick W. Jordan is Professor of Design Psychology at Middlesex University. He is a consultant to many of the world's leading companies, governments and the third sector.

Andy Bardill is Associate Professor of Product Design and Innovation at Middlesex University and Director of redLoop, the University Design and Innovation centre. He innovates in diverse fields from medical electronics and wearables through to museum experiences, robotics and affective design.

Kate Herd is a Senior Lecturer in Product Design and Innovation at Middlesex University and Associate Director of redLoop, the University Design and Innovation centre. Her research interests include customer and product experience, mass customisation and emotional design.

Silvia Grimaldi is course leader of MA Service Experience Design at London College of Communication, University of the Arts London. Her research focuses on product experience, narratives, surprise, and emotional design.

Appendix 17: Ali, H., Grimaldi, S. and Biagioli, M. (2017) 'Service Design pedagogy and effective student engagement: Generative Tools and Methods', The Design Journal, 20(sup1), pp. S1304–S1322. doi: 10.1080/14606925.2017.1352659. (Peer Reviewed).

Service Design pedagogy and effective student engagement: Generative Tools and Methods

Hena Ali, Silvia Grimaldi & Monica Biagioli

Published online: 06 Sep 2017.

Submit your article to this journal ⬀

Article views: 156

View Crossmark data ⬀

Service Design pedagogy and effective student engagement: Generative Tools and Methods

Hena Ali[a]*, Silvia Grimaldi[b], Monica Biagioli[c]
[a]University of Westminster, London
[b]London College of Communication, UAL
[c]London College of Communication, UAL

*Corresponding author e-mail: H.Ali@westminster.ac.uk

Abstract : This practice-led investigation evaluates three generative design tools for active and tacit student engagement with postgraduate Service Design students, and their impact on the students' approach to complex design projects. In Service Design education generative design tools have a robust pedagogical role for efficient knowledge creation and student engagement, yet are still under-explored academically.

The Learn 'n' link method delineates learning as an interactive dialogic practice for creative idea conceptualisation. The Zine Method is a visual ethnography approach that can be applied holistically to frame the problem area, propose a way forward, and prototype the solution. The Narrative Toolkit enables students to discuss and critique the narrative properties of existing designs and envision design outcomes. The students then use the Zine Method to qualitatively evaluate the methods' contribution to their understanding of complex design problems and service user experience, and their function in bridging the gap between user research and generative design processes.

Key Terms: Service Design Education, Generative Methods, Pedagogy, Student Engagement, Complexity, Simplicity, Meaningfulness

1. Introduction

This exploration of Service Design pedagogical methods, as well as qualitative design research approaches, develops generative pedagogical methods and tests these with service design students in a studio environment. The study is led by design academics that are practicing designers, design researchers and social innovators, aiming to contribute to the discourse on the emergence of service design pedagogy, and validating innovative design-led methods within Service Design (Service design colloquium parson school, 2013).

Studio based design pedagogy engages students and tutors in practice (Shreeve & Batchelor, 2012) and is embraced as 'constructed, self-regulated, situated, and collaborative' practice informed by design thinking as a team-based learning process (Scheer et al. 2012). Service Design, as an emerging discipline,

draws on multidisciplinary practice to strategically develop innovations. Service Design Pedagogy though is still under-explored academically (Sanders.2002, Gaver.1999), methods are evolving rapidly, and generic methods informed by traditional design pedagogical practice are employed for knowledge dissemination and creation. In Service Design, which primarily focuses creativity, experimentation and innovation in the public sphere, the consideration of generative tools can support questions, building a framework for design practice and reflection. A lot of methods are adapted from the service design industry into pedagogical methods for service design. Similarly, this research re-appropriates traditional generic design pedagogy to custom-design three structured collaborative, experimental, generative design methods, with the aim of exploring effective student engagement in terms of attention, retention and innovative process.

Within Service Design practice, generative design tools have a robust role mapping, defining, developing and delivering effective and sustainable services. This research develops three customised generative design methods with an innovative pedagogical role to test efficient knowledge dissemination and student engagement. Learn n Link, Narrative Toolkit and Zine Methods delineate learning as an interactive dialogic practice; these methods draw on individual capacity as well as collaborative team dynamics enabling the students to process information with time-based knowledge mapping, connecting and analysing activities (Learn n' Link). They allow students to discuss and critique the narrative properties of envisioned design outcomes (Narrative Toolkit). In addition, these methods allow the student to creatively visualise the problem area and solution and record emotion in decision-making (Zine Method). The practice identifies with the notion of cultural mapping (Duxbury 2016); an 'action journey' undertaken specifically thorough structured methods to identify and investigate the complex context within which service design operates. These methods take the students through a structured journey to absorb, assess and map knowledge creatively; to create innovative transformation strategies and services through deep reflection.

2. Design-led Evaluation Framework

The Higher Education Academy UK reports the term 'student engagement', based on definitions in the literature and the discussion of the character of engagement and its alternatives, summarised below:
> Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution (Trowler, HEA, 2010).

Within Service Design, where students come from diverse backgrounds, we are conscious of making assumptions based on traditional education models. Design thinking in this context is useful to engage students creatively while learning and designing reflectively. The researchers observed engagement in response to the methods designed. The methods presented here were specifically designed to draw on the practice of knowledge transfer in the context of co-design, organizational learning, active learning, converting tacit knowledge to explicit knowledge, collaborative knowledge construction, peer-to-peer

learning and learning-by- doing. Engagement and creativity was assessed qualitatively using reflective insights, narratives around the learning experience, and zines as holistic and subjective records of the learning experience.

3. Learn n Link

Learn n Link is a two-step context mapping method for professional Service Design projects. From a design pedagogy perspective, the method is tested at design brief stage for creative idea conceptualisation. It helps facilitate identification of alleged issues within a design brief. The method is designed to facilitate students' instinctive impressions to be collated analytically into thematic design insights using a systematic format (Learn n Link Canvas Fig: 3). The method draws on reflexivity for creative knowledge generation and is examined with 14 Service Design and Innovation students in UK to understand efficacy.

Learn n Link method is carefully structured within an operational framework (Fig: 1) which helps map information in visual thematic clusters to identify problems, issues, and action points as initial service design touch points. For this paper Learn n Link was tested in design studio setting, as a class presentation, to keep it focused and measurable for evaluation purpose.

Design Brief
(Information/Data)

{ Processing → Identifying → Mapping → Collating }

Initial Assumptions
Design Questions
Design Initiating points
(Information/Data)
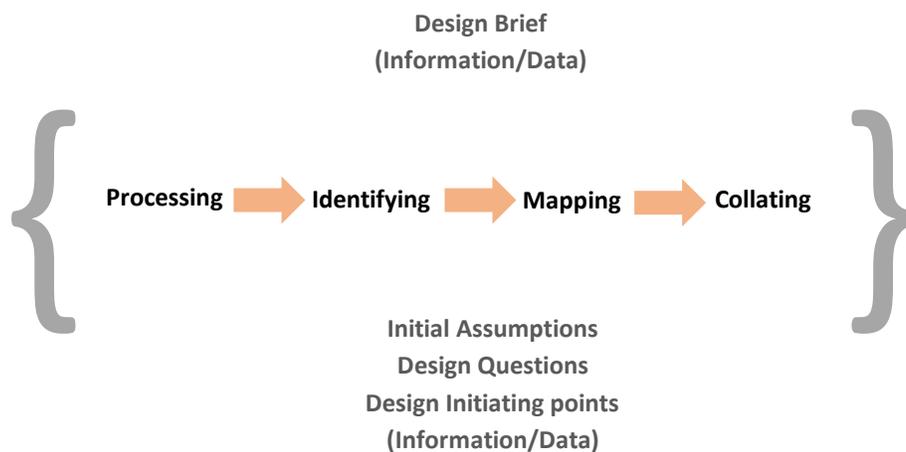
Figure 1: Learn n Link framework

Traditionally design students are required to research a design brief by mapping, absorbing, processing and reflecting creatively large chunks of information. This can be challenging to process especially when large complex data creates confusion and pressure hence students lose engagement. To address this, Learn n Link is specifically designed to turn confusion to an active learning experience by using

structured word-pop and knowledge mapping activities. The method helps generate visual semantic maps as graphic structures to display meaning-based connections between a set of connected actions and design concepts, whilst retaining full student engagement throughout the session. The method commences with individual activities seamlessly transitioning into a group activity. This allows students to gradually process and analyse knowledge. Within studio setting, students' work with specific time frames to respond and time is monitored with music.

3.1: Learn (individual) Activities

Table 1: The Practice Framework

What	Active learning as an interactive dialogic practice
How	By using word-pop activity to identify, map and linking information in the shortest possible time
Why	To semantically identify and link thematic strands within a project after initial project introduction within design discovery phase as per double diamond process model
Who	MA Service Experience Design and Innovation students
Why	Resulting visual semantic maps effectively display meaning-based connections between a set of related: design objectives, actions and concepts as exploration points that leads to more fluid open ideation phase

Students are briefed about the activity before presentation of data through a power point presentation. They are asked to think about issues, actions taken, actions need to be taken, probable solutions within the following categories (Table: 2). They asked to note down as many relevant words to *action* or *descriptive* words appearing relevant to design challenge in their notepads, in no specific order at this point, during the presentation. They are especially instructed to create rich lists of as many words as possible. The words are then organized in lists using large sheets. As a time-based activity this helps to instinctively absorb process and reflect on data by rapid generation of key word-lists using Learn n Link Canvas (Table: 2)

Table 2: Learn n Link Canvas

Stage 1			
		What is the *problem/issue?*	WORDS ONLY
Learn: Processing-Identifying **(Individual mapping activity)**	**Using** *Learn n Link Canvas* **Develop a key-word bank in diaries/notepads from data presented by a 20 minutes' power-point presentation. 5 minutes to enrich list with more words**	Why it exists: *factors/gaps*	WORDS ONLY
		How: *Actions that* are there, or could be some possible solution/solutions	WORDS ONLY

Table 2: Stage 1

Positives: Existing or Suggested			Negatives: Existing or Suggested		
Factors	**Impact**	**Action**	**Factors**	**Impacts**	**Actions**

3.2: Link Activities (Group Activity)

Table 3: Stage 2

Stage 2 Link		Add as many words to the 4 lists.	WORDS ONLY
		Identify connected-words	For problems, actions, solution, and reasons from what you are being shown in response to the design challenge
Mapping-Collating (A collective group activity)	**Collectively Identify, Strategise, Conceptualise**	**Break the lists and re-make thematically**	Whatever themes are evolving from lists generated in earlier stage. It could be anything, no framing at this point
		Organize thematically	Action impacts from lists and add your own ideas in the form of your own words to create more volume of ideas.
		Discuss and brainstorm.	Think of issues and problems and in response identify possible solutions (at least 5)
		Identify	Design questions, Research questions to take the research forward
		Discuss and iterate, Discuss and iterate.	Discuss and iterate, Discuss and iterate issues, challenges, possible solutions, research question-insights, design feasibilities as solutions to be developed and tested
		Prioritize	Most effective solutions on the scale of 1-2-3-4-5
		Suggest	Pitching possible design opportunities / solutions (minimum3- maximum 5). Identify next design stage (Group presentation)
		Identify	Next design phase (Group presentation with the data generated)

Stage1: Key Words
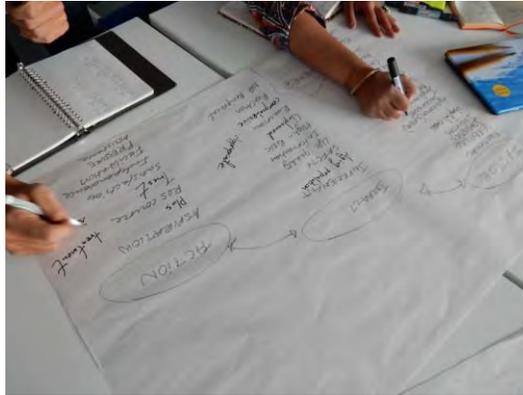
Stage1: Structuring

Stage2: Thematic Clustering

Stage 2: Design Insights

Stage 2: Strategise

Stage 2: Initial Pitch

Figure 2: Learn n Link Structured Two Stage Activities

During the second stage students are instructed to break into groups and use big sheets of paper to combine their lists and get more volume in insights. They are asked to identify themes as design touch points, collate and connect insights, develop future scenarios and define design feasibilities. Towards the end of the session they are asked to pitch five possible solutions to be further developed in the next stage. Each activity has a set time duration, which is signaled through music.

Student feedback was recorded after a week of the design sprint. They responded to open-ended questions regarding their learning experience. The questions were structured around ease with simplification of complex data and information comprehension, interest and retention, design insights and idea generation, collective and individual creative experience (team dynamics).

Even after a week, the students were quite expressive about 'achieving a lot in such a short time'. They reflected on how the learning experience felt interesting and engaging. Most of them reported an initial feeling of discomfort at being asked to work in an unconventional thinking out of the box manner, however they quickly re-adjusted to the experience, easily followed instruction and created rich lists of key words. They admitted that the unusual way of working turned into an interesting and a useful way to develop creative ideas. Using word-mapping activities demonstrated to them how seemingly spontaneously generated semantic maps helped graphically display meaning-based connections between obvious knowledge and a set of creative design actions without too much effort and stress. The seamless transition of the learning from individual experience to teamwork helped them unpack observations and insights from the presentation collectively and develop design leads. The student reported how the clarity in understanding the context, issues, challenges, and stakeholder-needs, as creative design touch points, made it easy to reflect on initial solutions. The students also shared how they applied the method to other design briefs for other modules and found it very useful, creative and easy to apply.

One student quoted "How I missed the class and felt bad later as one of my friends told me how they worked with music and developed some great ideas. It was creative and fun way to work." Another student reported "I was confused first when asked not to think and just filter words popping out, but later I thoroughly enjoyed reacting to, and processing ideas, instinctively".

4. Narratives in Design Toolkit

The Narrative in Design Toolkit is based on the Author et al.'s Narratives in Design framework to analyse the ways in which narratives are used in design (Author et al., 2013). Narrative is used quite a lot in the human-centred design process, through more ubiquitous methods such as design ethnographies, user personas, or product narratives attached to brands, but the contribution of the narrative qualities to the design are not precisely defined. In addition, narrative is central to the way we interpret events and the way we assimilate these into our own life stories.

Narratives in Design Toolkit is a card set which re-elaborates and simplifies the framework described in Author et al (2013), dividing it up into five cards, Who, What, Where, When and Why. It is a method to both analyse the narrative features present in existing designs and to generate new design work based on its narrative qualities. This method helps talk about the ways in which design may be interpreted in a narrative way and enables a language to talk about narrative features of design work both in an analytical context and within generative phases of a project. When used in a generative way, the toolkit helps to envision how a design outcome may be interpreted in a narrative manner, before the design has been generated. The Toolkit therefore allows designers to refine a brief to the point of a concept, in a very human-centred way.

Service design is particularly tied to narrative because of its user-centred approach, its reliance on narrative forms of user research, such as ethnography and experience mapping, and the fact that services are necessarily experienced over time, and narrative is the mechanism we as humans use to make sense of time-based events (Abbott, 2008). Narrative is also particularly good at conveying complex sets of information that needs to be remembered (Lloyd, 2000), as well as empathising with people (Wright and McCarthy, 2008); these are both particularly important aspects to service design projects.

Table 4: Narrative Toolkit Operative Framework

	FRONT	BACK
INSTRUCTIONS	Narratives in Design a toolkit to analyse the use of narrative in design, and to help define the use of narrative in the design process. Mark your answers on each card as you go through them.	These cards are designed to help you assess the way narrative is used in existing design examples, as well as help guide your use of narrative during the design process. To redesign or reposition existing work, change the answer on one or more of the cards, and redesign accordingly. To create new work, answer the questions on the card as part of the idea generation process, keeping an open mind in terms of repositioning design work.
DESCRIBE the narrative	....	Please describe in your own terms the narrative(s) present within this design example. You might find it easier to discuss this with someone before writing it down.
DETAILS	Designer: .... Project: .... Year: .... Where & when was this filled out?	Your name .... (leave blank if you wish to remain anonymous) Your email address .... (leave blank if you don't want to receive updates on the project)
WHO	CREATOR → AUDIENCE User → User User → Designer Designer → Designer Designer → User	Who creates the narrative and who is the audience of this narrative? Designers may create narratives for users, but they may also create narratives for the design team. In the same way, users may be creating the narrative for themselves or other users, or for the design team.
WHEN	In the design process In the user experience	When is narrative present? Is the narrative used within the design process, for example as a research tool or as an idea generation tool, or is it designed into the user experience of the object, for example through associated stories or trajectories through space?
WHERE	Internal to the object External to the object	Is the narrative internal to the object or external to the object? An internal narrative is understood by looking at or using the object without requiring additional information. An external narrative is understood only after referring to additional information not contained in the object itself. For example the user may need to read something, view an accompanying video, or hear an explanation.
WHY	Communication & Conveying Information Evoking Reflectivity Showing & Teaching Values Empathy, Identification & Bypassing Social Structures Imagination & Creativity Memorability Engaging & Delighting Persuading Cohesion & Comprehension	Why is narrative used, to what effect? In this card we are interested in what the narrative does, within the context of the design, as opposed to what effects the design itself has. For example, an object might delight because of its physical appearance but not through a narrative.
WHAT	Minimal Narrative Sequenced Narrative Logically Sequenced Narrative Value-Laden Narrative Entertainment Narrative	What type of narrative is present? Minimal Narrative: a representation of one or more events. Sequenced Narrative: a representation of one or more characters or entities in a series of chronological events. Logically Sequenced Narrative: Sequenced Narrative where chronological events are connected by causality or agency. Value-Laden Narrative: an emotion-evoking and value-laden Logically Sequenced Narrative. Entertainment Narrative: a Value-Laden Narrative, which progresses through conflicts toward a climax.
FEEDBACK	....	For more information about the Narratives in Design workshops: narrativesindesign.wordpress.com or email Silvia Grimaldi on s.grimaldi@lcc.arts.ac.uk

Figure 3: The Narrative Toolkit helps students to envision how a design outcome may be interpreted in a narrative manner, before the design has been generated

Fourteen Service Design postgraduate students participated in the two-hour workshop. They were first trained in using the cards by describing their own experience of a service, and then analysed this narrative with the Toolkit. Following this, students were asked to write down all the narratives that they had accumulated through the first phases of their current project, which involved focus groups with service users and providers, and analyse these narratives using the Toolkit. In the final stage of the workshop students were asked to use the Toolkit to define a narrative about the final outcome of the project, thus defining the way in which this service would communicate to users and would be received by users, before defining what the service actually is. This narrative could be written from any stakeholder's point of view and outlined what the consequences of the project would be as opposed to what form the project would take. This in part mimics the technique used in Invisible Design (Briggs et al., 2012), with the toolkit aiding in the construction of that envisioned narrative.

Observations during the session showed that the initial exercise was necessary to understanding the method, as a lot of questions were asked and clarified through this phase. The majority of students were able to use the cards as an analytic tool, with some students requiring facilitation in this task. When it came to using the tool as a generative method, students were able to immerse themselves in writing the narrative.

Observing the results that were shared at the end of the session it is clear that engaging with a narrative from a particular point of view enabled students to identify ideal outputs or ideal final situations for the project as well as enabling students to empathise with different stakeholders. From the informal oral feedback at the end of the session and the formal feedback collected from the zines it emerged that several students were able to use this tool to envision what the effects of the final design outcome could be on the different stakeholders and hence had a better idea of what they could design to get the desired effect. Some of these students reported this being the first time they were able to envision an outcome. Most students also engaged in the way in which a final service outcome could be presented back to the different stakeholders.

5. Zine Method

The Zine Method utilises a multi-page technique from the graphic arts, the zine, as a space where elements of a problem area or a solution can be mapped via the visual plane. Going beyond the single page format, the zine allows for multi-page and multi-dimensional expressions to come into contact with each other; for example, visual notions that have not been connected in the mind of the participant can be juxtaposed via this approach while still retaining their individual integrity in the single page. The zine format applied here was developed by Biagioli and co-designed with Allan Owens and Anne Pässilä for application during the IFKAD 2016 conference (Biagioli, Owens, and Pässilä 2016). This format allows for notations to be made on the single page plane, so that focus can be applied to the singularity of that image, while at the same time allowing for an overview of the project to happen via the cuts and folds built into the construction of the zine. These allow for multiple ways of structuring and 'reading' the information and for various juxtapositions to be made depending on proximity of spreads. There is an element of chance built into this design that frees the participant temporarily from making causal relationships between elements, and allows those relationships to emerge depending on how the structure is presented. It is a method that encourages intentional play, much like a game or a puzzle.

Via the Zine Method, complex sets of elements can be represented in one package (the zine) letting ideas emerge from the active handling of the paper matter; by folding in different ways, by setting up the zine into a three-dimensional structure that refers to a larger concept taking shape in the mind of the participant. It is an emergent framework that expresses as an active process the subjective engagement with complexity and ambiguity in problem solving.

Because of its playful format, the students first engaged with the zine by folding and unfolding it, trying to figure out the possibilities of its construction. The researcher expected students to apply visuals singularly on each page and then allow for all those single expressions to come together in a variety of ad hoc constructions.

Instead, a majority of the students worked out a holistic concept for the zine and used the single pages to represent the various, complex elements within that structure. This took the format into new applications not expected at the onset of the research session. The MA students applied the format in three key ways as an active part of presenting their current projects on the course: used as a material prototype/visual aid to visually express how the student frames the problem (Shaika); used to demonstrate how the student is going about solving the problem (Tritra); used as an actual early version, rough prototype of the outcome intended for the project (Jeff).

The Zine Method proved to be a strong visualising tool—a method of paper prototyping—that allowed the student to model the problem area and/or its solution and use that model as an active element of presenting the idea.

Zine Method Construction

* Cut paper into 21cm x 21cm square
* Fold paper into 16 squares
* Cut within the zine construction as indicated by the dotted lines
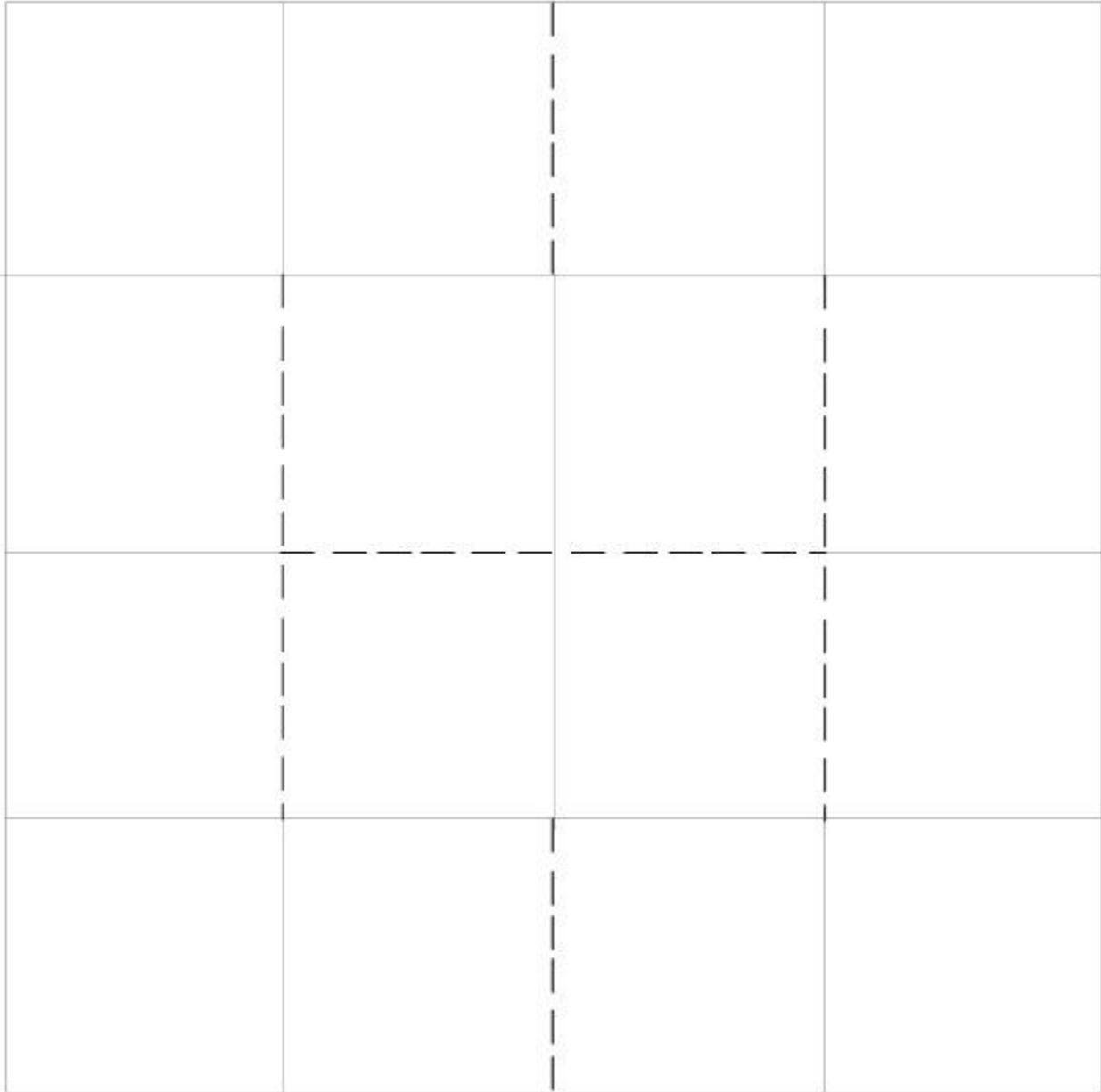
Construction developed from existing zine format (Golden 2010) and applied
by the research team of Monica Biagioli, Allan Owens, and Anne Pässilä
during the IFKAD 2016 Conference in Dresden, Germany. June 2016.

source: Zines as qualitative forms of analysis. 2016

Figure 4: Method Construction

Mapping emotions during project through drawing. Signe. Detail from her conclusion zine. 2016

Framing the problem.
Shaika. 2016

Solving the problem.
Tritra. 2016

Prototyping the solution.
Jeff. 2016

Reflecting on emotion.
Signe. 2016

Figure 5: Mapping Emotions

During the Zine Method session, students would report back on how they were using the method without prompting and the researcher recorded these reflections. At the conclusion of the session, we went over as a group the key uses of the Zine Method.

• Mapping the project ahead (prototype)
• Emotional relationships map/record (uncertainties)
• Finding relationships out of random placements

• Using form of zine as metaphor (a house, for example)
• Brainstorming around a theme
• Storytelling—use as communication tool
• Focus of each member of a team
• What is going on with yourself
• Connect disconnected elements
• The juxtapositions of the format work really well
• Nice method to mix it up
• Embrace the uncertainty

These can be grouped into three categories:

A way to progress the project iteratively. This is done by applying the format to map the project ahead; use it as metaphor; brainstorm ideas around one theme on the format; and create a narrative through it that operates as a communication tool.

A way to reflect subjectively on own engagement with the process/project/team working. Each zine can focus on various members of a team to identify their position and contribution to developing project. It can serve as a self-reflection tool; "what is going on with yourself"

As a contained way to address complexity and ambiguity in solving a problem. It can map and record uncertainties within the process and how emotion plays a role in decision-making. It can help find relationships out of random placements and connect elements previously disconnected.

The students generally commented that the juxtapositions of the format work really well to mix things up at key points of the process and help the designer embrace uncertainty at key stages of a process.

This was the feedback emailed to the researcher by one of the session participants (Anupa):
"Our [project] group used the zine as one of our iterative methods where we created another one. Could understand the process better.

1. A great iterative method which helps link unrelated ideas.
2. The formation of multiple ideas at one session helps you time manage better.
3. The themes that are generated, are either strong or weak, so it helps the individual or group to deliberate, articulate and generate constructively.
4. Multiple zines can be used at the project and session, either with similar themes or unrelated. The inferences lead to better insights. Helps in Co creation.
5. I feel the zine methodology is similar to the agile method - the process of creation to execution to insight building to revisiting."

Two participants used the zine format to document their emotional state during the project, and used it as well to map the emotional state of those they interviewed as part of their work on the project. This is

a key application of the method, as there are so few opportunities to properly account for emotion in project development and evaluation.

5. Conclusions and discussion

Figure 6: All three methods employed as a methodology for effective student engagement and sustainable design generation

The three methods engage with complexity, drawing on emotion and subjectivity to foment student involvement with a process and actively engage creativity for service design pedagogy.

The researchers designed this pedagogy to bring design skills and knowledge to the foreground as integral components of learning and experimenting; enhanced student engagement through innovative teaching methods; and as demonstrated in the feedback sessions, provided a richer learning experience so as to generate a deeper understanding of problem area and solution for the students involved in the sessions.

Our contribution is in three key areas: addressing complexity, addressing personal points of view and narratives, and acknowledging the role of emotion in the process of analysis. Service design projects are complex. Creative teaching facilitates understanding through the organisation and interpretation of project information and encourages connections to emerge from the process. The key element is to

break up the brief/initial info/ text and pull out information that can help initiate the research from an informed baseline (discover and define phase) to the more open and creative ideation of design outcomes (develop phase). Engaging with narratives in the process of envisioning design outcomes allows students to easily empathise with stakeholders and interpret the design from their point of view. The zine construction foments exploration of the project space in all its facets, and also allows for prototyping the solution. Personal perspectives can be expressed via folds, cuts, and placement in three-dimensional space. All three methods can be especially useful when there is conflict or a project has stalled. Emotions are made visible and can in that way be a part of the analysis at key junctures in the project. If foregrounded at the very beginning of a project for both stakeholders and designers by structuring interactions to account for them, then their emergence throughout the project can be better managed. This is a key finding, as the emotional dimension is often not captured in the analysis process, and yet, it is a key component in decision-making (Pässilä and Owens 2016; Gill 2016; Damasio 2000).

Using only one method for evaluation at the completion of the project, the zine method, worked to reinforce ideas through the method. Findings related more to its application and it is believed by the researchers that this was a format bias. The finding from this is that in future testing of various methods with one group, the researchers would make all methods available for conclusions and evaluation; in this way giving the participant control over the way findings would be organised and presented. This could in turn allow for hybridising of methods at the evaluation stage, perhaps combining all three in one format.

This initial research suggests that these methods have a lot of potential to fill specific gaps within Service Design Pedagogy. The next steps in this project will be to continue testing and refining these methods by embedding them throughout project work on an MA in Service Design, continue to test applicability to other projects within the service design field and continue to identify pedagogical gaps to address through design methods.

References

Abbott, H.P., 2008. *The Cambridge Introduction to Narrative.* Cambridge University Press.

Biagioli, M., Owens, A., Pässilä, A. (2016) Zines as qualitative forms of analysis. Proceedings of the 12th International Forum on Knowledge Asset Dynamics: Big Data, Creativity and Culture. Accessed 12 December 2016: http://www.knowledgeasset.org/Proceedings/

Biagioli, Owens, A., and M., Pässilä, A. (2016) Gnosis 2020: International network on Reflexivity through Art-Based Methods in Rethinking Leadership and Management Across the professions. Zine. Issue 1.

Briggs, P., Blythe, M., Vines, J., Lindsay, S., Dunphy, P., Nicholson, J., Green, D., Kitson, J., Monk, A., Olivier, P., 2012. *Invisible design: exploring insights and ideas through ambiguous film scenarios*, in: Proceedings of the Designing Interactive Systems Conference. pp. 534–543.

Damasio, A., 2000. *The Feeling Of What Happens: Body, Emotion and the Making of Consciousness*, New edition. ed. Vintage.

Duxbury, N. (Forthcoming in 2016). *To be published in Spanish as "La cartografía cultural - hacia las políticas y la planificación cultural más participativas y pluralistas?"* In M. Rebón and M. Ortiz (Eds.), Indicadores Culturales 2015. Buenos Aires: Instituto de Políticas Culturales "Patricio Loizaga," Universidad Nacional Tres de Febrero (UNTREF).

Gaver, B., Dunne, T., & Pacenti, E. (1999). *Design: cultural probes. ACM interactions*, 6(1), pp 21-29

Gill, S. (2015) Tacit Engagement: Beyond Interaction. Springer, London.

Golden, Alisa (2010). *Making handmade books: 100+ bindings, structures and forms.* New York: Lark Crafts.

Grimaldi, S., Fokkinga, S., Ocnarescu, I., 2013. Narratives in Design: A Study of the Types, Applications and Functions of Narratives in Design Practice, in: Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces, DPPI '13. ACM, New York, NY, USA, pp. 201–210. doi:10.1145/2513506.2513528

Lloyd, P., 2000. *Storytelling and the development of discourse in the engineering design process*. Design Studies 21, 357–373.

Pässilä, A., & Owens, A. (2016). *Sensible sensitivity: arts pedagogy in management development. In Organizational Management*: Approaches and Solutions. Kogan Page.

Sanders, E. B. N. (2002). *From user-centered to participatory design approaches.* In Frascara, J. Design and the social sciences: Making connections. London: Taylor & Francis, from http://servicedesign.nyc/news/parsons-service-design-pedagogy-colloquium/

Shreeve, A., & Batchelor, R. (2012). *Designing Relations in the Studio: Ambiguity and uncertainty in one to one exchanges.* Design and Technology Education: An International Journal, 17(3).

Scheer, A., Noweski, C., & Meinel, C. (2012). *Transforming constructivist learning into action: Design thinking in education.* Design and Technology Education: An International Journal, 17(3).

(Service) Design Process Model (Design Council UK)

Wright, P., McCarthy, J., 2008. *Empathy and experience in HCI,* in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI '08. ACM, New York, NY, USA, pp. 637–646. doi:10.1145/1357054.1357156

Trowler, V. (2010). *Student engagement literature review.* The Higher Education Academy, 11, 1-15

https://innovationenglish.sites.ku.dk/model/double-diamond-2/

About the Authors:

Hena Ali: communication designer, innovator, journal reviewer, and a senior lecturer at University of Westminster, London. She is a fellow of the Royal Society of Arts, London, and holds a practice-led PhD in 'Communication Design for Sustainable Social Innovation' from Central Saints Martins, UAL.

Silvia Grimaldi: course leader of the MA Service Experience Design and Innovation at London College of Communication, University of the Arts London.

Monica Biagioli: fellow of Royal Geographical Society, member of the International Association of Art Critics, member of the Photography and the Archive Research Centre, and senior lecturer at London College of Communication, University of the Arts London.

Appendix 18: Biagioli, M., Grimaldi, S., Ali, H. (2018) Designers' Emotions in the Design Process, in Design Research Society Conference Proceedings, DRS2018, Limerick, Ireland.

Designer's emotions in the design process

BIAGIOLI Monica[a]*; GRIMALDI Silvia[a], and ALI Hena[b]

[a] London College of Communication, University of the Arts London
[b] University of Westminster
* Corresponding author e-mail: m.biagioli@lcc.arts.ac.uk
doi: 10.21606/dma.2017.408

This is a position paper towards the establishment of a research network to address the impact of tacit experiential knowledge, emotion, and cultural perspective on a designer's decision-making during a design process. With this network, we are aiming to start a focused discussion across geographies and cultures regarding the role and impact of designers' emotions within their own design process. The function of this is to foreground the experiential and emotional domain of designers' practice and examine the role of tacit experiential knowledge in design decision-making.

The paper sets up the basis and context of discussion, exploring the three key areas to be addressed by the network: designers' emotions as key drivers in decision-making; tacit experiential knowledge; and addressing emotion in culturally-situated design practice. This is followed by our proposed methodology and network objectives and expected impact and outcomes.

design process, emotion, culturally-situated practice, tacit experiential knowledge

1. Introduction

This position paper outlines the proposal for an international research network of design academics and industry specialists to highlight the importance of non-textual, narrative, qualitative methods and forms of expression to represent as well as foreground emotional and experiential aspects of designers' engagement within a design process.

There are two key questions driving our research. Can we explicitly account for designers' emotions during a design process? And can we demonstrate any links between designer emotion and decision-making in a design process? If we can, as designers, access this type of tacit information—belonging in the informal realm, characterised by complexity and ambiguity, and expressed as emotion—then its impact on rational decision-making can be acknowledged.

We are focussing on the designer's emotions and experience within a design process as the designer is often considered a neutral person within the process. However, from our teaching experience,

design students have complex relationships with their project especially when they tackle "wicked problems" (Buchanan, 1992; Rittel & Webber, 1973). Some of these projects generate strong emotions and feelings in the designer, such as empathy, sadness, anger or a feeling of empowerment, and this has a bearing on the project outcomes. We are drawing attention to qualitative methods because they allow for gathering information, such as tacit experiential knowledge and emotional states, that would not be visible in data set analysis, however, has impact on project planning, engagement and outcomes. The research work we propose aims to help the designer identify key emotions at play at different stages of a project or activity. In addition, we will examine how designers' emotions play a role in how the project is structured and delivered and how the findings are collated and interpreted.

We are building our approach to the network and its methods from an understanding about cultural transmission of information (formal, informal, technical; Hall, 1959), the impact of our data-driven reality on human communication (Boorstin, 2012; Marshall McLuhan, 1994) and how that has a direct effect on our sense of embodiment (Dewey, 2005; Laing, 2010). We connect the difficulty to base decisions on qualitative forms to a lack of trust generally in the informal realm—particularly emotions—to impart useful information in regards to decision-making (Belfiore & Bennett, 2008; McGilchrist, 2009). An appreciation and respect for the tacit dimension (Gill, 2015; Ingold, 2000; Polanyi, 2009; Schön, 1985) is a key aim of the work we propose for this network.

The project is proposed with a short-term (first phase) and long-term engagement plan. The research network will form the first phase of the longer project. In this first phase we will be inviting participants to two discovery workshops and one dissemination event. These workshops and events will be held in London over the course of 18 months, from Summer 2018.

The diverse participant group draws knowledge across disciplines and geographies to get a more rounded picture about emotion and its impact on the design process. The initial call for interest has drawn a group of 20 participants from Pakistan, Brazil, U.S.A., Israel, Finland, Spain, Denmark, and the UK. Adopting a democratic and participatory structure to the network sessions will, as much as possible, seek knowledge from sites of experience outside of the UK. Participant expertise spans across different subject areas and contexts, including academics and industry representatives in service design, product design, British Council Pakistan, workshop facilitation, graphic design, fashion, business and management, innovation, transdisciplinary art, teaching and learning, and IT.

The first workshop will address the three main themes: emotion, tacit knowledge and cross-cultural participation.

Designers make tacit experiential decisions at every stage of the design process. Emotions such as empathy, anger and fear in relation to a particular topic, circumstance, or grouping can trigger responses that influence a design process. The role designers' emotions play in this process is not often made explicit, despite the important function emotions play in decision-making. This has implications for the role of the designers' emotions in design decisions. Human-Centred and Emotional Design (Forlizzi, 1997; Hassenzahl, 2010; Jordan, 2000; McDonagh, Hekkert, Erp, & Gyi, 2003; Norman, 2003; Sanders & Stappers, 2008; Wright & McCarthy, 2008) often focus on end users' emotions, however the emotions of designers and facilitators within co-design situations are not acknowledged as often. The informal, the non-textual, the narrative and the emotional that exist in the liminal space between formal analysis of data and formal design decision-making are not accounted for qualitatively and/or made explicit.

Qualitative design and art based methods have a particular value for accessing informal, non-textual, narrative, and emotional elements and making them tangible. These qualitative design methods are often applied to researching the end users' emotions, but rarely are they used to look inwards towards the designers themselves.

Emotion is in the informal domain and accounting for its role in a decision-making situation requires an acknowledgement of embodied experience. There is a current bias towards quantitative forms of collecting and analysing experience in order to make the case for making decisions which omit findings from the informal experiential range, as they are so difficult to quantify.

Through the research network, we will draw knowledge across disciplines and geographies to get a more rounded picture about designers' emotions and their impact.

2. Emotion, Tacit Knowledge and Cross-cultural Participation in the design process

2.1. Section 1: Designers' emotions as key drivers in decision-making

Emotions have a troubled history. Within western contexts, emotions have been for centuries contrasted with reason as two separate driving forces of human nature, with an implicit or explicit value judgement about which force holds more value (Damasio, 2000; Lutz, 1986). From a cultural point of view, emotions have been used as a way to judge "others" whether those "others" are women, or people from different cultures, or from different classes. "To look at the Euroamerican construction of emotion is to unmask the ways in which that schema unconsciously serves as a normative device for judging the mental health of culturally different peoples" (Lutz, 1986, p. 288). Within this context, this dichotomy also allows to maintain a system of power relations based on this ideological distinction (Lutz, 1986).

Because of this distinction, the studies on emotion from a scientific perspective are still at the beginning. There is a clear gap in the study of emotion between Darwin's studies in 1872 (Darwin, 1998), widely considered the first scientific studies on emotion, and the 1960s, in which very little was written about emotions from a scientific point of view. This can be attributed to the fact that emotion was not considered, for most of the last century, to be a worthy subject, and was left in the background in favour of reason. Emotion was "relegated […] to the lower neural strata associated with ancestors whom no one worshipped. In the end, not only was emotion not rational, even studying it was probably not rational." (Damasio, 2000, p. 39). This view still dominates the scientific framework for the study of emotions, and there is still very little study of emotion from a scientific perspective. With the advent of psychology and psychotherapy (the thinking of Freud and Jung dominating the development of thinking into the 20th century), other sciences started to advance theories about emotions and viewing them as inseparable parts of our mental process, working in symbiosis with the part we call reason.

Antonio Damasio is a neurologist who pioneered the study of emotion and their effect on human consciousness by studying patients with brain damage in the emotional areas of the brain. He has shown that emotions are necessary to run a regular life and have particular implications for decision-making. Individuals who have brain damage in areas of the brain related to emotions seem unable to make 'rational decisions' and will make "personal and social decisions [that] are irrational, more often disadvantageous to their selves and to others than not." (Damasio, 2000, p. 40). This clearly challenges the cultural idea that emotion and rationality are two contrasting forces, and in fact theorises that emotion is necessary for rational decisions to take place.

Scientifically, emotions are chemical and neural responses to stimuli from the outside or from memory, and they have a regulatory function within the body. This function has a number of implications for the physical state of the person and for the person's state of mind. By changing the mental state of a person, they make the person experience what is around them in a different way and make a mental association between the particular stimulus (object or event that caused the emotion) and the emotion felt (Damasio, 2000, 2006). The emotional state that was associated with

the stimulus will be remembered whenever the person is thinking of that particular stimulus or whenever this is encountered again.

This has implications for the decision-making aspects inherent in tacit knowledge. One very interesting study looks at the decision-making of a psychotherapist in a consultation with patients who have attempted suicide. The psychotherapist's written assessments on whether the patient was likely to re-attempt suicide were not reliable in predicting this risk (29% accuracy). However, an analysis of the psychotherapist's facial expressions, with a method devised by Ekman et al (Ekman, Friesen, & Tomkins, 2009) which codes facial expressions against emotions, revealed that frowns and worried facial expressions in the psychotherapist were a much more accurate assessment of this risk (81% accuracy). This was also compared to a study of the patient's micro-expressions in the same interaction, which did not lead to a method of coding these expressions that was as reliable to predict suicide reattempt. The psychotherapist was therefore able to read the tacit communication from the patient better than an algorithm, and interpret this in an instinctual and emotional way (Heller & Haynal, 2002). This type of study is still quite rare across many fields, not least because of the complexity of coding the information; however, it is a prompt towards thinking about the tacit and emotional knowledge that humans bring to their decision-making.

Human-Centred and Emotional Design (Forlizzi, 1997; Hassenzahl, 2010; Jordan, 2000; McDonagh et al., 2003; Norman, 2003; Sanders & Stappers, 2008; Wright & McCarthy, 2008) often focus on end users' emotions, however the emotions of designers are not acknowledged as often. Within craft-based design practices this approach has been increasingly valued; for example Niedderer &Townsend, Mäkelä and Nimkumrat and Kosoken & Mäkelä talk about experiential and emotional knowledge within craft-based design processes, and how this reflection can be documented through design based methods (Kosonen & Mäkelä, 2012; Mäkelä & Nimkulrat, 2011; Niedderer & Townsend, 2014). Seitamaa-Hakkarainen et. al discuss the role of autoethnography in documenting designers' working processes (Seitamaa-Hakkarainen, Laamanen, Viitala, & Mäkelä, 2013). Groth examines the links between emotion and decision making as well as tacit knowledge and embodied cognition in craft making processes (Groth, 2016). Anne Louise Bang reflects on the design process, in particular in terms of emotion and tacit knowledge, outside of a strictly craft-based setting within the textile design field (Bang, 2009, 2011). While these approaches are valuable to this research, they have not been commonly applied to researching the emotions and tacit knowledge of designers within a co-design situation, and in relation to designers' roles within an organisational context .

2.2. Section 2: Tacit experiential knowledge

As the world of work evolves to make room for robotic components and algorithmic computation to input into decision-making and realise more and more complex tasks, it is increasingly important to consider the organization's view of their workers as embodied persons.

Giovanni Schiuma argues that "organizations have to be managed as 'living organisms' in which the people and the organizational aesthetic dimensions are recognized as fundamental factors to meet the complexity and turbulence of the new business age." (Schiuma, 2011, p. 2) For that, Edward T. Hall's diagram of human activity is highly relevant. He deduced a system of understanding human activity in three porous layers: formal, informal, and technical (Hall, 1959). The formal layer is occupied by expectations, values and structures; those values and structures are shaped into more codified forms (rituals, language, protocols) in the technical layer; and the informal layer is where shifts can happen and is the terrain of gesture, play, informal learning, and a sense of individual space and beliefs.

It follows that accounting for the informal requires an acknowledgement of embodied experience. As John Dewey explained it: "Experience is the result, the sign, and the reward of that interaction of

organism and environment which, when it is carried to the full, is a transformation of interaction into participation and communication." (Dewey, 2005, p. 22). For Dewey, there were complete experiences, holding transformative and aesthetic potential and characterised by feelings of satiety and fulfilment, and inchoate experiences, obstructed by distraction and dispersion. The many layers of diversion and entertainment broadcast from various media sources create a level of inertia that Daniel Boorstin identified over 50 years ago as visual gauze, at the time when mass media lodged into the North American consciousness. This disjunction between what is communicated (and how) and what is experienced leads then to more frequent inchoate experiences; dispersed and incomplete.

The result, as Iain McGilchrist identifies, are various current maladies: "loss of tolerance of ambiguity; the carrying out of procedures by rote without understanding; de-individualisation; paranoia and lack of trust; a worship of the quantitative and devaluation of quality; and downgrading of expertise and its capacity to react with spontaneity and creativity in favour of 'expert' knowledge that can be pre-determined" (Holmes, 2012, p. 163). This loss of faith in more holistic, embodied forms relates to our current means of communication that shape as well our sense of identity (M. McLuhan, 1964).

In their book on the social impact of the arts, Belfiore and Bennett account for our growing reliance on evidence to make the case for policy; with "hard data, such as facts, trends and survey information...widely seen as the 'gold standard'" (Belfiore & Bennett, 2008, p.5). The subtext riding below the surface of this approach is that qualitative forms of analysis cannot be trusted to formulate decisions. Satinder Gill sees it as a situation where "the paradigm of data (of parts) and utility gives primacy to transactional information over that which is relational." (Gill, 2015, np). She addresses "the problems of bottlenecks of vast quantities of data and how to relate to them (expert systems, databases, big data), and how to support our relations with each other and share and enable us to impart knowledge and skills when we are distributed in space via various mediating interfaces" (Gill, 2015, np).

As Michael Polanyi cautions, "if we build up a culture recklessly on the assumption that only things are valid which can be broken into parts – and that the putting together will take care of itself – we may be quite mistaken, and all kinds of things may follow." (Polanyi, 1989, quoted in (Gill, 2015, np)) Drawing attention to qualitative methods and more explicitly accounting for tacit experiential knowledge and emotional states—not just in participants and end users but also in designers and facilitators —can address this imperative to consider societal problems and needs holistically.

2.3. Section 3: Addressing emotion in culturally-situated design practice

Participatory design practice can be explored within specific groups. Multicultural research that situates itself across diverse cultural practices benefits from this method in particular to understand the phenomenon of knowledge creation and designers' decision-making processes as a whole (Björgvinsson, Ehn, & Hillgren, 2010; Sanders & Stappers, 2008). Here cultural context is defined as values and attitudes that shape the context (Mondoux, 2010). Where culture creates the context for social interaction to determine how knowledge will be used in particular situation (Long & Fahey, 2000).

Models of decision-making usually focus on cognitive, situational, and socio-cultural variables in accounting for human performance. However, the emotional component is rarely addressed within these models (Gutnik, Hakimzada, Yoskowitz, & Patel, 2006). According Polanyi (Polanyi, 2009) understanding how people feel gives us the ability to empathize with them; tacit knowledge can reveal latent needs, i.e., needs not recognizable until the future Hence, discovering what people think and know provides us with their perceptions of experience (Sanders & Stappers, 2008). We may be overwhelmed by emotions and make decisions or we choose an option not so much because

we evaluate its consequences positively, but because we feel good about it; we may even be torn apart between emotions and cognitions, as in the proverbial conflict between heart and mind (Duque, Turla, & Evangelista, 2013).

However, with data driven innovation and tech revolution overtaking the world, design as a creative discipline and designer as a creative actor (Latour, Mauguin, & Teil, 1992; Law, 1992) is floundering in this tug of war between data, technology and emotional intelligence defined as a set of skills hypothesised to contribute to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life (Salovey & Sluyter, 2001). Although, brands may need data to understand human emotion, they also need humans to understand the emotional data that will help them maximise effectiveness, as humans, not robots, create emotional bonds. Emotions are important as key drivers for value mapping of actors, networks to explore decision-making processes within specific design contexts as existing networks and drivers (Latour et al., 1992). However, for participatory design projects to be successful designers need ". . . not only to analyse existing actor networks but ultimately to redesign them in ways that help establish and maintain participative structures" (Kensing & Blomberg, 1998) as well as solve problems. The most common application of tacit knowledge is to problem solving. According Leonard & Sensiper (Leonard & Sensiper, 1998) the reason experts on a given subject can solve a problem more readily than novices is that the experts have in mind a pattern born of experience, which they can overlay on a particular problem and use to quickly detect a solution. "The expert recognizes not only the situation in which he finds himself, but also what action might be appropriate for dealing with it.

Neuro-economics is applied as evidence for the emotional aspect of decision-making and its role as a new framework of investigation, as it builds a comprehensive theory of decision-making through the unification of theories and methods from economics, psychology, and neuroscience. Even though this approach promises to be valuable as a comprehensively descriptive and possibly better predictive model for construction and customization of decision support tools for health professionals and consumers, there is ambiguity in its usefulness for designers who are designing these tools (Gutnik et al., 2006).

Contrarily, drawing on Actor Network Theory (Latour, 2007; Latour et al., 1992) participatory design practice (Björgvinsson et al., 2010; Sanders & Stappers, 2008) bridges knowledge gap within diverse contexts (Bonnet, Lema, & Auken, 2010; Cheryl Mattingly, 2000) by creating immersive knowledge mapping spaces, and facilitating development of narrative expressions of social knowledge. In this model, it is human narrative that draws a bridge between the tacit and the explicit, allowing tacit social knowledge to be demonstrated and learned […]. In addition, narrative in the expression and transmission of social knowledge, is a specific type of tacit knowledge, and defines a new perspective for designing and developing interactive systems to support collaborative knowledge management.

The key concept here is to involve domain experts in participatory knowledge design for mapping and translating their professional models into the proper vocabularies, notations, and suitable visual structures for navigating among interface elements (Valtolina & Colombo, 2012). Participation brings in narrative as a central mechanism, by which social knowledge is conveyed (Linde, 2001) and emotions are mapped as culturally situated values and decision-making drivers, as knowledge is understood as is inherently complex and dynamic across contexts, strategies and identities (Williams, 2006).

3. Proposed methodology

As part of this research network will be inviting participants to two discovery workshops and one dissemination event over the course of 18 months. The participant group draws knowledge across

disciplines and geographies to get a more rounded picture about emotion and its impact on the design process. The makeup of the group is detailed in the introduction; we invited researchers and practitioners who we knew had worked in the field of emotions, tacit knowledge and cross-cultural participation, and who, from previous conversations and previous collaborations, we thought would have an interest in this topic. In particular, we tried to draw people who had worked on emotions, tacit knowledge and cross-cultural participation in relation to problem-setting and wicked problems.

The first workshop will address the three main themes: emotion, tacit knowledge and cross-cultural participation, making use of qualitative art and design methods to:

- Test various spatial and relational configurations that allow embodied experience to emerge as key finding from informal experience. Evolving methods for accounting for the informal in a situated experience.
- Note and capture tacit experiential emotional responses in our research network in tandem with the capture of data of network participants' personal values and attitudes. Analysis of this data will be conducted to evolve a means of understanding the relationship between what is expressed as personal value and attitude and what is textually recorded as personal values and attitudes.
- Note and capture emergent human narratives: discovering what people think and know provides us with their perceptions of experience.
- Test methods of documenting and visualising emotional experience throughout the design process and its possible links to decision-making.

At this stage, we hope to identify 'where, when and how' within design process are significant points of interests for designers accounting for their own emotions. This process of learning shall evolve valuable insights and identify challenges within existing and new design practices.

The second workshop will provide spaces for contributions by participants around the themes of the project, as well as methodological contributions to gathering and analysing data. The aim of the workshops is to construct a democratized design space to engender an open mind set. In addition, opening up the workshop to methodological contributions will help to assess the validity of the methods used, and test innovative methods coming from culturally and geographically diverse regions, and different disciplinary contexts.

The exploration is perceived as valuable in terms of identifying emotional triggers, challenges and recharging points within design practice for designers' emotions as design confidence and wellbeing. This in retrospect impacts the collaborative project outcomes operationally. Accounting for designers' emotions can lead to balancing stress, facilitating the feeling of being in charge of things, and identification of motivators to push into action. Enquiring from a socio-cultural perspective, the aim is to realise a comprehensive database as baseline to work up from. This shall help ascertain effective design tools to map designers' emotions and develop a rich repository of perspectives. This can lead to effective working and collaborative initiatives where the designer's wellbeing is accounted for as central to project sustainability.

The dissemination event will then broadcast the findings as well as provide a platform for more voices to shape a future project.

4. Network Aims, Objectives, Impact and Outcomes

The proposed aims, objectives and impact address 5 main thematic areas: The role of emotions in the design process; Qualitative methods to record emotions; New discourse about the design process; Application of tools to understand users' emotions to the understanding of designers' emotions; Representing the diversity of participants.

THEMES	AIMS (what?)	OBJECTIVES (how?)	IMPACT (who cares? What happens? So what?)
Role of emotions in the design process	• Specify the role of emotions in decision-making within design processes. • Define what is valuable information in the design process for the designer.	• To create a clear link between design process and emotion • Provide templates for designers to map and track their emotions against a project timeline.	• **Develop an index** of potential tools and techniques to help the designer account for type, timing and sequence of emotions during a project, not just for participants but also for him/herself. • **Provide templates** for designers to map and track their emotions against a project timeline. • **Provide tools to address difficult projects** and how to advise people to account for difficult emotions during a decision-making process that is in blockage, stasis or breakdown.
Qualitative methods to record emotion	• Highlight the value of qualitative design methods to access and record emotions, and make these tangible. • This can help identify qualitative methods to access the non-textual, the narrative and the emotional forms of expression to represent and foreground emotional and experiential aspects of designers' engagement with a design process.	• Draw knowledge across disciplines and geographies to get a more rounded picture about emotion and its impact. Towards that end, we have put together a team of 20 participants from Pakistan, Brazil, U.S.A., Israel, Finland, Spain, Denmark, and the UK:	• **A new index of qualitative methods** that can address designers' emotion and are design specific.
New discourse about the design process	• Identify a new discourse about design process that takes into account the designer's emotion as a focal point • The project doesn't have to be instrumental. It aims to identify designers' emotions and the impact on their own design practice, in terms of decision-making within a process.	• The project will provide case studies to visualise the designers' emotions mapped against time on the project, with points in the graph identifying key points of confusion/stress as well as design tools to address those. • To account explicitly for what is valuable information in the design process for the designer	• **Re-map the double diamond** to account for the designer's emotional experience at each stage. • **To make tangible the tacit, experiential decisions** made at each stage of a design process. • **To identify the emotional blocks** at key points in a decision-making process. • **Build capacity and resilience for designers** by accounting for the designer's emotions in the design process.

Application of tools to understand users' emotions to the understanding of designers' emotions	• Account for the informal, the non-textual, the emotional, that exists in the liminal space between formal analysis stage and formal decision-making, that cannot be captured through quantitative methods. In other words, the thoughts, feelings, and actions that cannot be recorded or captured in quantitative form. The capture of emotions does not need to be instrumental. It can simply allow designers the right to account for their feelings during a design process. • Improve understanding of designers' emotions in the design process, currently under-represented. For example, human-centred design and emotional design focus mainly on users' emotions, while designers are seen as neutral. • Address the gaps in human centred design and emotional design, which are always focussed on users', not designers', emotions. Designers are seen as neutral facilitators. This references Bruno Latour's notion that nothing and no one can be seen as being completely objective.	• Identify the tacit, experiential decisions made at each stage of the design process. What role do informal, non-textual, narrative and emotional elements play in the design process?	• **Define a framework for evaluating** the impact of emotions for design process decision-making • The project can also be instrumental and **identify/develop tools to address difficult projects** and how to advise people to account for difficult emotions during a decision-making process that is in stasis or breakdown.
Representing the diversity of participants	• Democratic approach to the research network.	• Draw in expertise from different subject areas and contexts. To that end, we are involving 10 design academics, 6 academics across business and management, innovation, transdisciplinary art, teaching and learning, and IT; and 4 industry representatives from service design, product design, workshop facilitation, graphics and fashion and the British Council PK.	• The outcomes should be **applicable** as much as possible to **different cultural and discipline contexts** and are not UK-centric.

Table 1 Network themes, aims, objectives and impact

Through the network and addressing the 5 themes above we aim to highlight designer's emotion and tacit knowledge in a cultural context. The capture of emotions does not need to be instrumental. It can simply allow designers the right to account for their feelings during a design process. By not providing an exact methodology for including these aspects, but more a set of possible methods that can be used and modified by the designer, we aim to empower the designer to be confident about including not only their tacit knowledge and emotional experience, but also the tacit understanding that comes from the experience of culturally situated practice.

We see the impact of this research in design higher education as a starting point, partly because of the authors' own backgrounds as well as because of the context in which the project emerged. However, doing this work in education is a way of prototyping techniques that can then be adopted in other contexts, such as design industries, participant facilitation, and design research. By accounting for emotion we are enhancing the innovation potential of the process.

We envision that the outcomes of the network would be a publication of the research findings, to be disseminated in a public event, including:

- A series of case studies/short piece contributions from the network participants (currently have 20 participants from our initial call) to share knowledge across disciplines and geographies regarding designers' emotion and tacit knowledge. This would provide an initial overview of the current consideration of designers' emotion and tacit knowledge and impact in the sectors represented.
- A collection of potential qualitative tools and techniques to account for designers' emotions in the design process. Providing tools to address difficult projects and allowing designers to account for difficult emotions during a decision-making process that is in blockage, stasis or breakdown.
- The initial steps towards a framework for identifying and evaluating the impact of emotions for design process decision-making, by re-mapping the double diamond design process or adapting other design process mapping tools. To make tangible the tacit, experiential decisions made at each stage of a design process and to identify the emotional blocks at key points in a decision-making process.

5. Discussion and Directions

With this network, we are aiming to start a focused discussion across geographies and cultures regarding the role and impact of designers' emotions within their own design process. The function of this is to foreground the experiential and emotional domain of designers' practice and examine the role of tacit experiential knowledge in design decision-making.

Our intended outputs are: an index of emotional and experiential aspects; a cross-referencing of those with cross-cultural elements; and an index of qualitative methods examined within the framework of emotion, experience, and culture.

With these initial findings, we will seek to model an application of qualitative methods focusing on emotional and experiential aspects of designers' engagement within a design process. We envision this in the form of an index of potential tools and techniques to help the designer account for type, timing and sequence of emotions during a project, not just for participants but also for him/herself.

We also consider it relevant to provide a template for designers to map and track their emotions against a project timeline. The project will provide case studies to visualise the designers' emotions mapped against time on the project, with points in the graph identifying key points of confusion/stress as well as design tools to address those. From those, we will also propose a beginning approach to application of this model within the sequential framework of the double-diamond; seeking to identify points within the design process where qualitative methods are most relevant from the designer perspective.

This initial inquiry is a first step towards a bigger and longer project working with democratic approaches within design decision-making processes. We see the consideration of what is collected for analysis and how it is collected and analysed to be fundamental areas to explore towards this greater aim. This project is not about problem-solving but about taking a wider view into all the elements that play a role in a decision-making process in design.

6. References

Bang, A. L. (2009). Facilitated articulation of implicit knowledge in textile design. *Proceedings of Experiential Knowledge, Method and Methodology*.

Bang, A. L. (2011). Emotional Value of Applied Textiles: Dialogue-oriented and participatory approaches to textile design. Retrieved from http://www.forskningsdatabasen.dk/en/catalog/2265178715

Belfiore, E., & Bennett, O. (2008). The social impact of the arts. *Hampshire: Palgrave Macmillan*.

Björgvinsson, E., Ehn, P., & Hillgren, P.-A. (2010). Participatory Design and 'Democratizing Innovation'. In *Proceedings of the 11th Biennial Participatory Design Conference* (pp. 41–50). New York, NY, USA: ACM. https://doi.org/10.1145/1900441.1900448

Bonnet, J., Lema, D. G. P. D., & Auken, H. E. V. (2010). *The Entrepreneurial Society: How to Fill the Gap Between Knowledge and Innovation*. Edward Elgar Publishing.

Boorstin, D. J. (2012). *The image: A guide to pseudo-events in America*. Vintage.

Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, *8*(2), 5–21. https://doi.org/10.2307/1511637

Cheryl Mattingly, M. L. (2000). Learning from Stories: Narrative Interviewing in Cross-cultural Research. *Scandinavian Journal of Occupational Therapy*, *7*(1), 4–14. https://doi.org/10.1080/110381200443571

Damasio, A. (2000). *The Feeling Of What Happens: Body, Emotion and the Making of Consciousness* (New edition). Vintage.

Damasio, A. (2006). *Descartes' Error: Emotion, Reason and the Human Brain*. Vintage.

Darwin, C. (1998). *The Expression of the Emotions in Man and Animals*. Retrieved from http://www.gutenberg.org/ebooks/1227

Dewey, J. (2005). *Art As Experience*. Perigee Books.

Duque, M. J., Turla, C., & Evangelista, L. (2013). Effects of Emotional State on Decision Making Time. *Procedia - Social and Behavioral Sciences*, *97*, 137–146. https://doi.org/10.1016/j.sbspro.2013.10.214

EKMAN, P., FRIESEN, W. V., & TOMKINS, S. S. (2009). Facial Affect Scoring Technique: A First Validity Study. *Semiotica*, *3*(1), 37–58. https://doi.org/10.1515/semi.1971.3.1.37

Forlizzi, J. (1997). *Designing for Experience: An Approach to Human-centered Design*. Department of Design, College of Fine Arts, Carnegie Mellon University,. Retrieved from http://goodgestreet.com/docs/forlizziMDes.pdf

Gill, S. P. (2015). Tacit engagement. In *Tacit Engagement* (pp. 1–34). Springer.

Groth, C. (2016). Design- and Craft thinking analysed as Embodied Cognition. *FormAkademisk - Forskningstidsskrift for Design Og Designdidaktikk*, *9*(1). https://doi.org/10.7577/formakademisk.1481

Gutnik, L. A., Hakimzada, A. F., Yoskowitz, N. A., & Patel, V. L. (2006). The role of emotion in decision-making: A cognitive neuroeconomic approach towards understanding sexual risk behavior. *Journal of Biomedical Informatics*, *39*(6), 720–736. https://doi.org/10.1016/j.jbi.2006.03.002

Hall, E. T. (1959). *The silent language* (Vol. 3). Doubleday New York.

Hassenzahl, M. (2010). Experience Design: Technology for all the right reasons. *Synthesis Lectures on Human-Centered Informatics*, *3*(1), 1–95.

Heller, M., & Haynal, V. (2002). The Doctor's Face: a Mirror of His Patient's Suicidal Projects. In *Body Psychotherapy in Progressive and Chronic Disorders*. Karger Medical and Scientific Publishers.

Holmes, J. (2012). The master and his emissary. *Psychoanalytic Psychotherapy*, *26*(2), 160–170. https://doi.org/10.1080/02668734.2012.676994

Ingold, T. (2000). *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. Routledge.

Jordan, P. W. (2000). *Designing Pleasurable Products: An Introduction to the New Human Factors*. London: Taylor & Francis.

Kensing, F., & Blomberg, J. (1998). Participatory Design: Issues and Concerns. *Computer Supported Cooperative Work (CSCW)*, *7*(3–4), 167–185. https://doi.org/10.1023/A:1008689307411

Kosonen, K., & Mäkelä, M. (2012). Designing Platform for Exploring and Reflecting on Creative Process. *Procedia - Social and Behavioral Sciences*, *45*, 227–238. https://doi.org/10.1016/j.sbspro.2012.06.559

Laing, R. (2010). *The divided self: An existential study in sanity and madness*. Penguin UK.

Latour, B. (2007). *Reassembling the social: an introduction to actor-network-theory*. Oxford University Press.

Latour, B., Mauguin, P., & Teil, G. (1992). A Note on Socio-Technical Graphs. *Social Studies of Science*, *22*(1), 33–57. https://doi.org/10.1177/0306312792022001002

Law, J. (1992). Notes on the theory of the actor-network: Ordering, strategy, and heterogeneity. *Systems Practice*, *5*(4), 379–393. https://doi.org/10.1007/BF01059830

Leonard, D., & Sensiper, S. (1998). The Role of Tacit Knowledge in Group Innovation. *California Management Review*, *40*(3), 112–132. https://doi.org/10.2307/41165946

Linde, C. (2001). Narrative and social tacit knowledge. *Journal of Knowledge Management*, *5*(2), 160–171. https://doi.org/10.1108/13673270110393202

Long, D. W. D., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive*, *14*(4), 113–127. https://doi.org/10.5465/AME.2000.3979820

Lutz, C. (1986). Emotion, Thought, and Estrangement: Emotion as a Cultural Category. *Cultural Anthropology*, *1*(3), 287–309.

Mäkelä, A. M., & Nimkulrat, N. (2011). Reflection and Documentation in Practice-led Design Research. *Nordes*, *0*(4). Retrieved from http://www.nordes.org/opj/index.php/n13/article/view/98

McDonagh, D., Hekkert, P., Erp, J. van, & Gyi, D. (Eds.). (2003). *Design and Emotion*. London ; New York: CRC Press.

McGilchrist, I. (2009). *The master and his emissary: The divided brain and the making of the western world*. Yale University Press.

McLuhan, M. (1964). Understanding Media: The Extensions of Man, London: Rutledge. *Google Scholar*.

McLuhan, M. (1994). *Understanding media: The extensions of man*. MIT press.

Niedderer, K., & Townsend, K. (2014). Designing Craft Research: Joining Emotion and Knowledge. *The Design Journal*, *17*(4), 624–647. https://doi.org/10.2752/175630614X14056185480221

Norman, D. A. (2003). *Emotional Design: Why We Love (or Hate) Everyday Things* (1st ed.). Basic Books.

Polanyi, M. (2009). *The tacit dimension*. University of Chicago press.

Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*(2), 155–169.

Salovey, P., & Sluyter, D. J. (2001). *Emotional development and emotional intelligence: educational implications*. New York: BasicBooks.

Sanders, E. B.-N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *Co-Design*, *4*(1), 5–18.

Schiuma, G. (2011). *The Value of Arts for Business*. Cambridge University Press.

Schön, D. A. (1985). *The design studio: An exploration of its traditions and potentials*. International Specialized Book Service Incorporated.

Seitamaa-Hakkarainen, P., Laamanen, T.-K., Viitala, J., & Mäkelä, M. (2013). Materiality and Emotions in Making. *Techne Series - Research in Sloyd Education and Craft Science A*, *20*(3). Retrieved from https://journals.hioa.no/index.php/techneA/article/view/702

Valtolina, G. G., & Colombo, C. (2012). Psychological Well-Being, Family Relations, and Developmental Issues of Children Left Behind. *Psychological Reports*, *111*(3), 905–928. https://doi.org/10.2466/21.10.17.PR0.111.6.905-928

Williams, R. (2006). Narratives of knowledge and intelligence … beyond the tacit and explicit. *Journal of Knowledge Management*, *10*(4), 81–99. https://doi.org/10.1108/13673270610679381

Wright, P., & McCarthy, J. (2008). Empathy and experience in HCI. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 637–646). New York, NY, USA: ACM. https://doi.org/10.1145/1357054.1357156

Appendix 19: Narratives in Design Toolkit 2 as used in Case Study 2.

WHAT

entertainement
narrative

value-laden
narrative

logically
sequenced
narrative

sequenced
narrative

minimal
narrative

None

MICRO-EVENTS:

INSTRUCTIONS

Narratives in Design
a toolkit to analyse the use of
narrative in design, and to help
define the use of narrative in the
design process.

Mark your answers on each card
as you go through them.

INSTRUCTIONS

Narratives in Design
a toolkit to analyse the use of
narrative in design, and to help
define the use of narrative in the
design process.

Mark your answers on each card
as you go through them.

DESCRIBE
THE NARRATIVE

DETAILS

Designer: ....
Project: ....
Year: ....

Where & when was this filled out?

WHO

CREATOR ➝ AUDIENCE

User ➝ User
User ➝ Designer
Designer ➝ Designer
Designer ➝ User

WHEN

In the design process

In the user experience

WHERE

Internal to the object

External to the object

WHY

Communication & Conveying
Information

Evoking Reflectivity

Showing & Teaching Values

Empathy, Identification &
Bypassing Social Structures

Imagination & Creativity

Memorability

Engaging & Delighting

Persuading

Cohesion & Comprehension

WHAT

Minimal Narrative

Sequenced Narrative

Logically Sequenced Narrative

Value-Laden Narrative

Entertainment Narrative

FEEDBACK

These cards are designed to help you assess the way narrative is used in existing design examples, as well as help guide your use of narrative during the design process.

To redesign or reposition existing work, change the answer on one or more of the cards, and redesign accordingly.

To create new work, answer the questions on the card as part of the idea generation process, keeping an open mind in terms of repositioning design work.

Please describe in your own terms the narrative(s) present within this design example. You might find it easier to discuss this with someone before writing it down.

Your name

....

(leave blank if you wish to remain anonymous)

Your email address

....

(leave blank if you don't want to receive updates on the project)

Who creates the narrative and who is the audience of this narrative?

Designers may create narratives for users, but they may also create narratives for the design team. In the same way, users may be creating the narrative for themselves or other users, or for the design team.

When is narrative present?

Is the narrative used within the design process, for example as a research tool or as an idea generation tool, or is it designed into the user experience of the object, for example through associated stories or trajectories through space?

Is the narrative internal to the object or external to the object?

An internal narrative is understood by looking at or using the object without requiring additional information.
An external narrative is understood only after referring to additional information not contained in the object itself. For example the user may need to read something, view an accompanying video, or hear an explanation.

Why is narrative used, to what effect?

In this card we are interested in what the narrative does, within the context of the design, as opposed to what effects the design itself has. For example, an object might delight because of it physical appearance but not through a narrative.

What type of narrative is present?

Minimal Narrative:
a representation of one or more events.

Sequenced Narrative:
a representation of one or more characters or entities in a series of chronological events.

Logically Sequenced Narrative:
Sequenced Narrative where chronological events are connected by causality or agency.

Value-Laden Narrative:
an emotion-evoking and value-laden Logically Sequenced Narrative.

Entertainment Narrative:
a Value-Laden Narrative, which progresses through conflicts toward a climax.

For more information about the Narratives in Design workshops:

narrativesindesign.wordpress.com

or email Silvia Grimaldi on

s.grimaldi@lcc.arts.ac.uk

Appendix 20: Sample transcripts and qualitative analysis

5.2.1 Sample transcripts and qualitative analysis

Jules, Testing Session 1, K1 and K2

Jules was an individual participant in Testing Session 1, who tested Kettle 1 (K1) and Kettle 2 (K2). His interview was interesting because he was meticulous in his descriptions of the process, and very reflective in his approach. He described how some of what he does when boiling water has to do with his OCD tendencies, such as aligning the spout of the kettle always in the direction of the cup while boiling the water, and how what he does while waiting for the kettle to boil is related to his meditation practice, which encourages him to be reflective about everyday things.

This transcript segment refers to Kettle 1. The segment is separated into quotes by the lines, and on the right-hand side are the codes that apply to each quote.

Transcript Segment	Codes
Interviewer: Okay, so how was using that kettle? You actually noticed that it changed – which is different from some of the people that came... Interviewee: I started looking at it and I was quite intrigued because it was ... I mean, I might have looked at it anyway but I suppose it reminded me of a kettle that I did have, but that's going back about 20/25 years and it used to have, in the water gauge, it used to have a small red plastic ball at the top of the water gauge, so I was firstly looking to see if that one had it, but it didn't have.	Individual session K1 Description of kettle Key – memory NF6 – memory T1.1 – activates associated stories
And then I was just sort of looking, because I mean, the model I'd had of that was just chrome, so I was quite interested because it had that black lacquering on it but I could see just at the tops and underneath the lid, I could see tiny hint of the original chrome, so I was thinking had that been lacquered	Individual session K1 Description of use NF2 – reflection T3.2 – structures experience over time

post-purchase or did it come like that and it was only as I stood up I then noticed that there was some very, very difficult to see patternation but as the kettle heated up, that became more and more apparent and I thought is it a trick of the light and I didn't see it, but I thought it can't have been because it was completely black lacquered, so then this pattern became more and more apparent as it worked its way up the spout.

Interviewer: Yeah.

Interviewee: Nice, how did you do that?

Interviewer: It's a thermochromic lacquer which is basically ... changes colour with the temperature.

Interviewee: Yeah, but the pattern as well...

| | Individual session K1 Description of use Key – agency Key – emotion NF2 – reflection NF7 – delight |

Interviewer: The pattern's underneath. Did it make you approach it differently, the fact that it changed?

Interviewee: The fact that it had changed? I suppose I was just intrigued watching it change.

Interviewer: Okay.

Interviewee: So first of all I thought it was a trick of the mind, or a trick of the light; then I sort of became aware that it definitely wasn't so then I was just intrigued watching it and just seeing what it would do as it sort of moved up the various parts as it heated till it got to the spout and then, yeah… So quite engaging while I was waiting because I was trying to do as much as I would normally which would be just getting to a sort of quietish space – so it just gave me something to focus on.

Interviewer: Okay, so did that help get you into...

Interviewee: Yeah, I quite enjoyed that actually. Yeah.

In the first quote in this segment, the shape of the kettle makes Jules think of kettles that he used in the past, so the kettle has activated associated stories. In the second quote, he goes on to describe how, while waiting for the kettle to boil, Jules was observing the kettle closely as the colour was changing. This made him reflect on the black colour, and also double check if the kettle was changing or if he had registered it wrong to begin with. As the pattern reveals itself Jules realises that it is indeed changing. This shows that Jules was reflecting on the kettle, and the kettle structured his experience over time. The third quote shows how Jules asked about how the kettle was made and I tried to steer the conversation back to his experience of the kettle. In the fourth quote Jules describes his thought process throughout the product experience, which shows reflection. He states his delight with the experience "I enjoyed that actually". In this quote, I also thought Jules assigned some agency to the kettle by using the words "I was just intrigued watching it and just seeing what it would do", though this is a weak show of agency compared to some of the other interviews.

The next transcript section refers to Kettle 2. Jules spoke at length, without prompting, about the kettle experience in a stream of consciousness style, moving from topic to topic. This was typical of the way Jules interviewed, which was different from a lot of the other interviewees, who needed a lot more prompting. This style of interview also presented a problem when dividing into quotes and coding, as I was reluctant to break a single stream of thought into different quotes for coding.

Transcript section	Codes
Interviewer: So what did you think of that second one? What changed in the way you used it? Interviewee: I mean, I suppose I haven't made a cup of tea on a stove for … that would probably be getting on for 30 years or something, so it was quite a different experience. And then I suppose I found myself asking – which I could have asked you but I didn't – did it have a whistle on it, so I didn't know whether there'd be some sort of audible signal when it boiled or whether I was going to have to use my own sensory apparatus to make that decision. And then I suppose I then remembered why most people converted to using electric kettles and	Individual session K2 Description of use Key – agency Key – emotion Key – memory NF2 – reflection NF6 – memory T1.1 – activates associated stories T3.2 – structures experience over time

realising it was going to take considerably longer which sort of evokes some sort of tension in some ways in the busy lives that we lead I guess. You've got that expectation that a kettle should be boiled in a minute or two as opposed to something which is much longer and more sort of gradual. But then because I was sort of meditating whilst doing it, I found it sort of gave me a lot more to work with especially in terms of the sounds and that sort of evoked memories of that, on a stove that as the sound just begins very, very gently, sort of at the bottom, and a slight, sort of the metal just creaking a bit to start with and then starting to hear a little bit more as the water is warming and more creaking and moving in the kettle. And then the intensity of the sound begins to build and then obviously getting through to the point where you've got a visual sign of steam coming out of it. So I suppose it gave me more to work with and also that gets me because I'm very interested in how we appreciate time. So then on one hand I could sort of feel that tension of knowing that its normally quicker than this, and haven't had that experience of being in front of a kettle for that long for quite some time, but I'm quite interested in people trying to reconnect with things that take longer – either slowing things down or taking a longer term perspective on things. So you've got all that work by the [inaudible 00:28:56] Foundation and people like that – it's all about trying to think longer term and slow foods, slow movement trying to get more in touch with ourselves and the environment around us. So I suppose it definitely adds to that kind of an experience, but at the same time, I was aware that there was a tension there because I'm almost set on automatic to expect it to happen more quickly.

Interviewer: Yeah, did the sound add to the tension or take away from the tension?

Interviewee: I suppose it added to it in the sense of I was having to use it as a guide to when the kettle had boiled, but I was appreciating it at the same time; so it was a sort of mixed ... conflicted in some way – I was enjoying the sound but I was

also having to be observant of the sound, to know when it was ready.

Interviewer: Okay.

Interviewee: So it worked both ways, yeah.

Interviewer: Yeah. You talked a little bit about the fact that it reminded you of old kettles – was there anything else that it reminded you of or made you think of?

Interviewee: Yeah, I mean, I suppose I would have never made the tea probably back in those days; I wouldn't have been responsible for boiling the kettle when I was at home and we only had a kettle that you boiled on the stove, so I'd have either been present but invariably it would have been my mum who was there boiling it, so I may or may not have been present for the whole process but if I was, I'd be standing by her side, so then I can have a visualisation of that stove, of that scene, of being there with her, because it's something that I probably haven't done since right back then.

Interviewer: Yeah, yeah.

Interviewee: So that comes through quite strongly. Probably the mere fact that I haven't done it since make that somewhat stronger.

Individual session
K2
Key – memory
NF6 – memory
T1.1 – activates associated stories

Interviewer: Yeah. interesting. what about the comparison with the kettle that you normally use? So you said it took more time…

Interviewee: Yes, it was longer … I suppose that makes sounds but it's not sounds almost from the beginning of the warming process; I suppose you'd become more aware of that, as it's got hotter towards the end of the boiling process, so yeah, difference of auditory experience. I suppose I was looking out

Individual session
K2
Description of use
Key – agency
NF1 – info
NF2 – reflection
T3.2 – structures experience over time

for the steam – I was looking for signals; it was more of a manual process in that sense so I was aware that I was more in charge of having to do things, of determining as and when it had boiled. So I was looking out for signals which I'd never normally be doing with an electric kettle. I'd just be standing by it, but I'd placed all of my responsibility in the kettle, whereas now it was like a mad machine interaction!

Interviewer: [Laughter]

Interviewee: So yeah, it was quite different in that sense, in terms of what was going on within me, while it was happening, because I was engaging with it in quite a different way.

Interviewer: How would you describe the difference in the way that you were engaging with it?

Interviewee: Normally I would be using an electric kettle – I know what it's going to do, it's my regular kettle anyway, but I'm not having to do anything other than press a button and I know that as long as it hasn't broken, it will deal with the rest and switch itself off, so then I'm using that as an opportunity to focus and begin to steal my mind. In this instance, I couldn't do that to the same extent – I could focus in on the kettle in the same way, but I couldn't go through what I'd normally do because I was also having to be far more aware of ... I suppose it was more novel because I'm not used to going through those sorts of noises and sounds but I was also looking for those signals. So it was still sort of meditative in that way, but in a different sort of meditation – it's more sort of active in a way. So I guess I was trying to go through the same process but I was having to relate to it in a slightly different way because I couldn't expect things to happen. I was having to sort of pick up on them and then act in response to them. It was different. And some meditations would be like that anyway, so some would be more just sort of immersive and you can forget about things and other meditations I might do would be ones where you've got to engage more with something, so it's not

dissimilar to some of those practices, just a different experience.

Interviewer: Interesting. Yeah. So it's parallel with a different type of meditation that you do?

Interviewee: Yeah.

Interviewer: Nice.

Interviewee: And then you get all those weak parallels with tea and meditation anyway.

In the first quote of this section Jules talks at length, unprompted, about the associations that the kettle has brought up, to his childhood and other times he used a stovetop kettle. This was initially in response to the look of the kettle, but then he responded to the build-up of sound in the kettle, which made Jules remember the particularities of stovetop kettles he used in the past "a slight, sort of the metal just creaking a bit to start with and then starting to hear a little bit more as the water is warming and more creaking and moving in the kettle. And then the intensity of the sound begins to build". The buildup of the sound also changes the way he experiences the kettle throughout the time of the experience (structures the experience over time) and makes him reflect about how we perceive time (NF2 – reflection).

In the second quote Jules describes the conflict between enjoying the sound but also the sound building tension (NF7 – delight; Key – emotion) and he describes how this changes over time, structuring the experience, though this is weaker than in the previous quote. In the third quote; I prompted for further associations as this was a train of thought that Jules started in the first quote and then dropped. This brought up some quite strong memories of a specific place and time, with his mother, so this was coded as both memory and also activating associated stories, because he recalled a very vivid memory, that included a sense of setting and characters.

In the fourth quote, there is some discussion of the kettle giving information as to what stage in the boiling process it is at, but the striking part is the strong agency that comes across in relation to the kettle at the end of this quote "So I was looking out for signals which I'd never

normally be doing with an electric kettle. I'd just be standing by it, but I'd placed all of my responsibility in the kettle, whereas now it was like a mad machine interaction!" The fifth quote shows the tension between Jules' normal procedure for using a kettle, which involves a lot of meditation, and having to adapt to this other kettle which took up more of his attention. This shows both identity, in terms of how Jules relates to everyday tasks through meditation, as well as agency on the part of the kettle, which is demanding attention and a response from him.

Maya Testing Session 2, K3 and K4

Maya was one of the participants in Testing Session 2, testing Kettle 3 and Kettle 4. Maya came accompanied by a friend who was introduced as not speaking English, so didn't participate in the conversation. Both Maya and her friend took an immediate shining for Kettle 3, squealed with delight when the fish started moving, and just generally kept talking about this over and over. The first transcript section shows the first part of the interview about her kettle at home, while the second transcript section shows how she brought the conversation back to Kettle 3, and her delight in it.

Transcript section	Codes
Okay. And did you choose the kettle that you have or did you just happen upon it? Did you buy it or did it come with the flat or...	Individual session K0 (own)
I bought it, but I think I bought the kettle and the toaster and some other stuff...	
Okay.	
...all together because I needed ... when I moved to my flat, I needed quite a few things, so I just went to the shop and bought them.	
So what was your criteria for choosing it? Was it ... what was easiest or cheapness or was it that you liked how it looked or...	

So for me personally, I preferred the kettle with boiling water a bit more quick.

Okay, so you chose one that was quicker?

Yes. And… I don't like the heating pump inside, so I preferred to be … and see the flat, the bottom of the kettle because here the water is too hard in London and it leaves the limescale on the heating element.

Okay, great. So do you clean the limescale out of your kettle?

Yeah, I do.

Okay. Nice. I think that's it around your kettle at home.

Maya was very much disinterested in her kettle at home. Kettles are not something that she used in her home country, but in London she felt like she should have one. She chose her kettle on the basis of efficiency, and didn't particularly research the model, she "just went to the shop and bought them."

It's interesting to note the different style of interview when compared to the previous example of Jules, and my role as a researcher in some of the interviews had to be more active than in others, guiding the conversation more.

Transcript segment	Codes
So I'm going to ask you a couple of questions about using the two kettles, let's start with the first one. So	Individual session K4 Description of kettle Description of use

how was that different from using your kettle at home?

It took some more time to get ready. Yeah, and there's a cord connected – mine is usually like the second one and I take the kettle – there's no cord so I can just move it around.

	Individual session K4 NF1 – info

And you noticed that it changed colour half way through. What did that make you think or how did that make you...

So yeah, the colour is nice. You know it's hot when the colour is different, so you can not touch the surface, it's too hot. It's nice but I kind of like the other one.

	Individual session K3 Key – agency Key – emotion NF4 – empathy NF7 – delight T3.2 – structures experience over time

Okay, why did you like the other one?

Because of the fishes inside!

[Laughter]

It was really nice, especially when the water starts boiling and the fishes start swimming up and down.

[Laughter]

It's really interesting.

I like the fact that you asked me if they were alive before!

[Laughter]

I saw them at the bottom and wanted to be sure I wasn't making fish soup!

[Laughter]

Yeah, I kind of like to see something when I make it and with the first kettle I can't see what's going on inside.

And you can't hear anything either in the first...

Yeah, just when the water started boiling. And probably the main thing that would have stopped me using something similar, I mean, not the shape or anything else, but the cord attached because when you take it, you have to be careful for the cord and... Especially in all the small places around when everything is just near and even if you move slightly on the other side, you might just drop something or break something.

Yeah.

I think that the only thing I can say I don't like but I like the colour. It's nice, it's small...

Cool, okay. Was there anything else that either one of the kettles made you think of as you were making the tea?

Sorry?

What were you thinking as you were making tea?

About the fishes in the second one!

[Laughter]

I think that was the most interesting...

Okay.

...and when the water started boiling they start going up which is nice. Yeah.

In quotes one and two of this segment Maya shows disinterest in Kettle 4, dismissing it as "it's nice, but". It was an interesting interview as I tried over and over throughout the interview to bring the conversation back to Kettle 4, but it just didn't seem to resonate with Maya, or she was so taken with Kettle 3 that it was weaker in comparison so didn't hold her attention.

The third quote shows a lot of agency assigned to the fish "the fishes [SIC] start swimming up and down" as well as emotion and empathy "I saw them at the bottom and wanted to be sure I wasn't making fish soup!". It also shows delight with the kettle, as the conversation was full of laughter, and shows some structuring of the experience over time, especially describing how her perception changed after the fish started swimming.

The fourth quote goes back to Kettle 4, Maya is trying to formulate why she is not interested in the kettle, and she talks about its shape and colour being nice, but the chord attached to the back of the kettle makes her think that it could knock things over on the table; this last part was coded as facilitating story imagining, on the weak end of the scale, as Maya pictured a scenario in which this kettle would be problematic which affected her interpretation of it.

The fifth quote goes back to Kettle 3, and shows how this captivated her attention throughout the testing session and also structured the whole session for her.

Group session K3 Gr 2

All of the group testing sessions developed in a similar way, and the group dynamics were fairly consistent throughout the sessions. The differences were due to having to fit into a class schedule, so in some sessions only one kettle prototype was tested because it was the only one available at the time.

These sessions were structured differently from the individual ones. The conversation didn't start from their own kettles at home, but from asking one participant to boil the water and make tea for everyone. Other participants were asked to observe and contribute to the conversation. The transcript shown below refers to one of the sessions testing only one kettle prototype, Kettle 3. In addition, because these were design students, some participant questions focussed more naturally on the design and production of the prototypes themselves. This provided a challenge for me because I didn't want the participants to perceive my investment in the design, and I didn't want to spend the whole session

explaining the design. I therefore kept answers to a minimum and informed the participants that they would find out more in the lecture following the testing session.

Transcript segment	Codes
Okay, go ahead. There is green tea, regular tea, hot chocolate if anyone wants it, milk and sugar and biscuits. Are these little pieces of wood in there? **Have a look.** Is that little wooden fish? I've never seen that before, to put tea inside! **It's not tea inside.** It's little fish. So you can see if it's boiling. It starts swimming around. **[…]**	Group session K3 Description of kettle NF2 – reflection
So did you make the little fish? **Yeah.** I'm guessing that they're to let you know that the water is boiling? **They don't have a function as such but…** [chatter] What wood are they made out of? **I'm not sure – I got some scraps!**	Group session K3 Description of kettle NF2 – reflection

They're dying!

[Laughter]

That looks so good! I know so many people who would love that. Are you going to make them to sell? Is that...

I don't know yet.

My mum would love that!

Really?!

I guess it only wouldn't work if you don't have a see through kettle.

Imagine if they were like that **[inaudible 00:05:37]** so they would be like colourful or something.

Yeah, that's a good idea.

I'm not sure how safe it would be but you could coat them in like a thermochromatic paint...

I've looked into that. It can't be boiled or put in contact with food, so...

Do you coat it in like a plastic ... like a resin afterwards maybe.

You could, however, the resins that are resistant to boiling over and over, I can't find.

Yeah, and expensive probably as well.

There are also hydrochomic inks which would react to water but then you couldn't coat it with a ... and then they're in contact with food so...

You could even make them out of … like melt plastic into a mould and just put like a little blob of thermochratic ink in the middle and cover it up…

So they're clear, yeah.

…yeah, but just for like their eyes or…

Yeah, true.

Like a marble. Or glass – have you tried glass?

No, I haven't tried glass.

It's got a good heat conductor.

Yeah, that's true.

I guess the weight would be different?

Yeah, I don't know if they would float.

The first quote in this transcript segment is when the participant started making the tea, and first notices that there is something in the kettle, before realising that it's fish, and wondering if they have a function. This shows that the participant was reflecting on the kettle. It also shows how the dynamic in the group sessions developed differently, as there are several voices speaking and responding to each other.

The second quote shows the process described above, in which participants were curious about the production methods of the prototype and I tried to keep answers to a minimum and divert the conversation away from this. This also shows reflection, as participants are wondering how it's made.

The third quote coincides with the boil of the kettle. Here there is laughter, and emotions. The conversation is more animated and the prototype is assigned agency, and the participants feel empathy for it: "they're dying!". It also facilitates story imagining, as shown

by the participant who asked if I would make them to sell, and that her mother would love it, imagining how it would delight another person in another setting.

In the fourth quote participants go on a tangent, taking about how they could make variations to the kettle prototype, which shows both reflection and creativity. This might also be related to the fact that the participants in these group sessions have a design background, so this is a natural train of thought for them to follow.

Group Session K1 and 2 Group 1

Below is a transcript session from a group session testing Kettle 1 and Kettle 2. This segment refers to Kettle 2. The demographic is similar to the previous transcript segment. I included this segment to show that as I was interviewing I was conscious that I was only using audio as part of the data collection, and I wanted to make sure that the cause of the participant's laughter was recorded. I also prompted for more detail about the laughter.

Transcript segment	Codes
R: what makes you laugh? P? I don't know **R: just so I have it on the recorder** **R: is it making you think of something, or...** P? The bubbles, I don't know, it's funny. It's random P3: I like uhm if it's on an Aga, if it whistles, it's quite a homely sensation. [6.26] **R: yeah** **R: do you have a whistling one at home, or...** P3: Not at my home but at friends'	Group session K2 Key – emotion Key – memory Key – storyworld NF6 – memory NF7 – delight T1.1 – activates associated stories

R: Ok, yeah. So it's interesting that it gives you a homely sensation even though it's not something you have at home, yeah yeah.

P3: Yeah, it's not my home

[various laughter]

This segment has a particularly high amount of codes assigned to it. It is recorded as Kettle 2 is reaching the boil, and the sound is becoming louder and more prominent. The laughter and the explanation "it's funny, it's random" shows emotion and delight. The Kettle then activates a memory and an associated story of an Aga whistling and how it makes the space "homely", which also shows a storyworld. It was interesting that the kettle prototype prompts a "homely" sensation even though the association is not to the participant's own home, but to a friend's home.

Group Session K4 group 1

This transcript segment refers to Kettle 4, which was tested on its own. There is a lot of negative emotion in this transcript segment in response to the kettle.

Transcript segment	Codes
I thought I was going to whistle, when they used it, like the old-fashioned kettles that whistled. I find it so scary. **Really?** I think it's so scary. Yeah, I'm always scared of those kettles which **[inaudible 00:25:30]** and I'm scared that it's going to just like, you know, the very, very old-fashioned ones, they are not electronic, you	Group session K4 Key- emotion T1.1 – activate associated stories

put them on a gas and then you pop the lid on and a cap and it whistles, that's why they whistle because of that cap, I'm always scared it's just going to, the water is, the steam will just like knock that...

Make it come out?

...Yeah, off the cap.

Would the tape go back to its original colour?

Yeah.

It will.

There is lot of patterns.

Yeah, yeah.

Is that purposeful?

Yeah, I'm not going to explain.

It reminds me of the, like they used to do the mugs with that sort of effect, when you put a tea inside, and you have an image coming up.

Yeah, the heat reaction.

Exactly, that's the same heat reaction.

	Group session
	K4
	Description of kettle
	T1.1 – activates associated stories

I'm just not a big fan of that element.

Why did you not like it?

Because I feel like it needs a lot of attention to it.

It's very needy.

Needy?

	Group session
	K4
	Key – agency
	Key – emotion
	T1.2 – facilitates story imagining

It's very dangerous, it's very … it's kind of…

Interesting. You like your kettles to be low maintenance?

Yes.

Even the ones that you've got on hub they are quite high maintenance. I guess it's similar, you have to watch and you can't stop, so it's similar.

Yeah, yeah.

Mine is five pounds, and I think it's perfect. It was in Argos. And I use the filter, but before I didn't have filter, so I used tap water, and then it started to have a lot of lime scale, so after the filter now doesn't have. With my kettle, with kettles you can clean the lime scale with white vinegar and will be perfect, so like once in a while do it, because otherwise it's hard.

I just don't drink tea enough to do that.

Still high maintenance to clean the lime scale.

I know, it's really bad.

In the first quote in this segment, one of the participants says the kettle is scary (emotion), because it prompts associated memories of old fashioned kettles on the hob and the idea that the steam could send the cap into the air; it is interesting that Kettle 4 is not stovetop but electric, but it has a similar shape to a stovetop kettle.

The second quote explored associations between the kettle and other products the participant has seen before. In the third section a negative emotion is displayed again "I'm just not a big fan of that element", and the negative emotion is associated to the agency of the kettle "I feel like it needs a lot of attention to it. It's very needy.". This attribution of agency also shows the beginning of an imagined story about the kettle.

In the fourth section one participant discusses how they like their kettles to be low maintenance, while another describes how their cheap kettle does the job well, and the process they go through to clean the limescale. Other participants reply that they would not go to that effort to clean a kettle. This shows a lot of signs of how this object is part of the participants' identity, either by not being a purchase that they would waste their time on (the five pound Argos kettle being perfect) or by not being dedicated enough to their kettle's maintenance to periodically clean the limescale.

Group Session K1 and K2 Group 1

This transcript section refers to a group testing of Kettle 1.

Transcript section	Codes
R: did it have any other effect the, the change of colour? P2: I've never seen a kettle do that. I've seen mugs, but never a kettle, so I was quite shocked. I thought it was really dirty, and where it was steaming up it was making the black go grey **R: wow** P2: but then I realised the pattern P3: It's quite clever, it stops. If you explore that. Cause obviously now it's still hot and left on the side, if someone was to touch it P2: yeah, they could see it's still warm	Group session K1 Key – agency Key – emotion NF2 – reflection T1.1 activates associated stories
P6: I didn't even realise it was changing colour to be honest [laughter] **R: you know you're not the only one, half the people interviewed didn't realise**	Group session K1 Description of use

P6: cause I was looking at the kettle from the other side, so I couldn't really see that... I guess it starts from the bottom?

R: yeah

P6: yeah

P2: it's weird it goes from black to pattern, I thought it would go from a pattern to... so I don't know I feel like it's weird to start with a block colour, a dark colour

R: hmm hmm, why?

P2: cause that's the colour it would be in your kitchen, I don't think people buy black kettles too much

R: yeah

P2: hmmm and then, it changes colour only when it's hot, so you kind of lose the visual aspect

R: hmm hmm

P2: if you can have it the other way around

R: yeah. Or you add the visual aspect

P2: but at that first, you're not gonna use your kettle that much to

R: so why do you think the visual aspect happens when it's boiling?

P2: why?

R: yeah

P2: [mumbles]

R: I'll then explain to you why in the lecture but I'm interested to see what your interpretation of that is

299

P2: I think it's just to show the process of it, change happening? Physically and in temperature as well. I'm not sure, I'm interested now to know why

R: remind me, ask me that question during the presentation if I don't mention it myself

P2: yeah I will

In the first quote the participants expressed emotion "I was quite shocked" and describe their train of thought to try to understand what the kettle is doing, showing reflection, trying to understand what is going on in the kettle and comparing the kettle to other kettles and objects they used in the past. The participants also assigned agency to the kettle "It's quite clever, it stops" and they refer to associated stories both of past objects and also of burning oneself on a hot kettle. The second quote is less significant, describing the kettle. In the third quote the participants are reflecting as to why the kettle would go from black to pattern, as opposed to the other way around. I tried prompting more analysis by asking why they thought it was this way, which led a participant to talk about showing the process of boiling, though none of the participants engaged with this question much.

Section 5.3 shows how the data was made sense of and how this leads to insights and conclusions.

Appendix 21: Videos of the four kettle prototypes.

Available on: https://vimeo.com/album/5856340