Contemporary processes of text typeface design

Michael Harkins

Thesis submitted for the degree
of Doctor of Philosophy

Central Saint Martins
University of the Arts London

April 2018

This thesis is dedicated to the memory of
my brother, Lee Anthony Harkins 22.01.17†
and my father, Michael Harkins 11.04.17†

Abstract

Abstract

Text typeface design can often be a lengthy and solitary endeavour on the part of the designer. An endeavour for which, there is little in terms of guidance to draw upon regarding the design processes involved. This is not only a contemporary problem but also an historical one.

Examination of extant accounts that reference text typeface design aided the orientation of this research (Literature Review 2.0). This identified the lack of documented knowledge specific to the design processes involved. Identifying expert and non-expert/emic and etic (Pike 1967) perspectives within the existing literature helped account for such paucity. In relation to this, the main research question developed is:
Can knowledge of text typeface design process be revealed, and if so can this be explicated theoretically?

A qualitative, Grounded Theory Methodology (Glaser & Strauss 1967) was adopted (Methodology 3.0), appropriate where often a 'topic of interest has been relatively ignored in the literature' (Goulding 2002, p.55).

This research is specifically concerned with knowledge of design process relating to world-leading experts in the field. Data was derived via recorded in-depth interviews, these were transcribed, analysed and coded in accordance with Grounded Theory's constant comparative method (Glaser & Strauss 1967, p.105). From the analysis, raised concepts and themes resolved in the generation of three unique Grounded Theory core categories, these have been named: **Trajectorizing**, **Homologizing** and **Attenuating** (chapters 4.0, 4.1, 4.2 and 4.3). The core categories describe how experts negotiate the initiation of design, relational qualities with respect to design and continual accretive refinement of design. The core categories combine to resolve together (chapters 5.0 and 6.0) as workable, conceptual theory that describes and explains text typeface design process generally. The developed theory this research contributes, is anticipated suitable to be applied as analytical and/or prescriptive tools for future study, research and pedagogy in the specific subject area. Beyond this, disciplines such as graphic design, typography, information design etc. may also benefit from this research.

Acknowledgements

Acknowledgements

Firstly I have to thank my supervisors Professor Phil Baines, Professor Janet McDonnell and Doctor Catherine Dixon who have offered valuable advice throughout this part-time research project. They have also been hugely supportive, patient and tolerant at all times. I must also thank Andrew Haslam who encouraged and guided me towards applying to study for a research degree based on early conversations we shared regarding knowledge of typeface design.

I would also like to thank staff at the University of Portsmouth for their support and encouragement throughout this study. In particular Michèle–Anne Dauppe, Sarah Houghton, Estelle Taylor, Dan McCabe, Andrew Denham, Doctor Michael Wamposzyc, Sandra Zellmer, Doctor Marius Kwint, Doctor Simone Gumtau, Doctor Jenny Walden, Professor Catherine Harper, Tom Clulee, Professor Trevor Keeble and Sarah Turner.

Thanks also go to Monotype for access to their archives and to the St. Bride Library for access to books and sources not readily available elsewhere.

Huge thanks go to the participants of this research. They are: Matthew Carter, Gerry Leonidas, Martin Majoor, Robin Nicholas, Jean François Porchez, Christian Schwartz, Erik Spiekermann, Jeremy Tankard and Gerard Unger who generously offered their time and knowledge of the subject of text typeface design. It is their participation and assistance that allows this research to exist.

I have to acknowledge a great debt to my wife Lynne and daughter Georgie for the years of support they have given and the lost family time they have endured along the journey with me in completing this research.

Finally, thank you to my mother Diana and brother John for your continued support through such difficult recent times.

Contents

1.0 Introduction

2.0 Literature Review

3.0 Methodology

Items presented at Viva Voce not in this bound thesis:
Hard copy of transcribed interviews.

1.0 Introduction

Contents

1.0 Introduction

1.1 Introduction

Although many contemporary works exist that account for processes of printing and how-to accounts of typography, the processes of text typeface* design still remain relatively unexplored and unexplained. There are some glimpses, insights and part accounts into the personal views and methods of some designers toward text typeface design that have been documented (eg. Goudy 1940, Dwiggins 1940). Karen Cheng's (2005) book *Designing Type*, claims that it 'explains, in detail, how to design characters* into a set of unified yet diversified forms' (p.7). However, the book's core themes are formed around a comparative analysis of existing typeface glyphs* with some commentary towards a methodological approach. This does not deal with knowledge of process to any great extent. The lack of documented knowledge with respect to text typeface design will be discussed further in Literature Review (chapter 2.0). Little exists that attempts to address this in terms of research. This relates to knowledge of what text typeface designers do, why they make the decisions they make toward designing typefaces, how they account for this and how this can be rendered as explication of process or processes.

This research is a response to the current lack of recorded knowledge relating to text typeface design process. This thesis presents developed theories, based upon analysis of knowledge in relation to interviews with world-leading text typeface design experts, conducted specifically for this research.

Text typefaces are specifically designed to work optimally for the setting and reading of continuous text. For example, types set as the reading matter within book, newspaper, magazine and journal design etc. The typical range of sizes at which text types would be considered for continuous reading are small sizes. Such sizes would normally be somewhere between 7pt and 14pt, depending upon the actual design of the typeface. Sans serif* typefaces typically appear larger on the body* in design than serif type

*** Asterisk**
Throughout this thesis, words marked with the asterisk * indicate an entry within the Glossary. Words will be marked in the first instance only in order to avoid disruption to the reading of the text matter.

designs, therefore, are usually set at smaller sizes in text than serif* types. Typefaces designed for use above these sizes ie. above 14pt, would generally be considered for display setting purposes only.

The focus of this research relates to knowledge of what typeface design experts do and the decisions they make in creating text typeface designs. Data is derived by way of testimonies via in-depth interviews with world-leading experts in the field. The use of experts in this sense is advocated by the likes of Nigel Cross (2007, p.85) in terms of developing a greater understanding of design knowledge generally. The focus therefore is related to knowledge of the decision-making and actions of the expert – the processes of design. However, the author does acknowledge that by virtue of the fact that the participants of this research are experts in their field, the collected data pertains specifically to expert perspectives of typeface design. Although this may be perceived to create something of a tautological bind between epistemology and ontology – it is intentional in this research to study expert knowledge. It is not the intention to separate knowledge of process from expertise in this study.

This research adopts a Grounded Theory Methodology (Glaser & Strauss 1967) as a simultaneous method of enquiry and analysis toward collected data in order to develop theory. This allowed for an emergent and inductive model of research enquiry to develop. Grounded Theory Methodology fits with the aims of this research as will be discussed in 3.0 Methodology and that 'Essentially, the methodology is most commonly used to generate theory where little is already known, or to provide a fresh slant on existing knowledge' (Goulding 2002, p.42).

Although research conducted in respect of design process has been established in other design domains such as: architecture (eg. Akin 1986, Darke 1979, Eastman 1970, Lawson 1979); engineering design (eg. Bucciarelli 1994, Marples 1960); industrial/product design (eg. Cross, Christiaans & Dorst, 1996); urban design (eg. Levin 1966), there is a specific lack of research regarding knowledge of text typeface design process.
This research is intentionally limited to the collection and analysis of

testimony from type design experts that discusses and describes designing with respect to Latin* category typeface design. That is, the basic Latin script used as the standard character set for most Western and Central European language bases. Such design in turn is found used in other derived language bases worldwide. Further study may be potentially useful that draws from this research as a basis in order to explore design for other forms of non-Latin font language bases.

This research results in a developed Grounded Theory (chapter 4.0) that resolves in three core categories*, sub-categories and dimensions* (Glaser 1978), these are theoretically raised from and grounded by the data. The core categories* are **Trajectorizing*** (chapter 4.1), **Homologizing*** (chapter 4.2) and **Attenuating*** (chapter 4.3). These identify and explicate significant characteristics pertaining to the expert participants' knowledge of practice.

In terms of contribution to knowledge and in answer to the research aims (see 1.1.1), this enquiry provides theoretical renderings of text typeface design knowledge in the form of three main areas rendered as Grounded Theory core categories. This research also contributes knowledge in terms of the unique collection of interviews produced as part of the research enquiry. In addition, an original research method was developed – Empathic Memoing* (see 3.7.2) – as an augmentation of the Grounded Theory orthodox method of memoing. The research also contributes original visual diagramming relating to the overview of text typeface design process and specific routines pertaining to this. The contributions to knowledge that this research provides are discussed in detail in 6.0 Conclusion (section 6.1.1.1).

1.1.1 Motivation for the research

The lack of research in the subject area (discussed further in Literature Review 2.0) presented the opportunity to conduct a study that would contribute to knowledge in terms of establishing research relating to text typeface design process. It was also envisaged that such a study would allow subsequent research to develop.

The identification of the gap in knowledge leading to this study partly developed from the author's interests as a design educator, also from his prior education and design interests in the area of typeface design and typography. He observed there appeared to be little to consult with regard to the rationale of decision-making and the drawing and rendering of form relating to text typeface design. It was interest in this area that led to the development of the current study. An additional key motivation for this research was that it would benefit future research, practice and teaching in the subject area by means of establishing a research-based view of the processes of text typeface design. It was anticipated that such explication of process would also help establish formal descriptions of knowledge in the area, which in turn, would aid toward professionalising such specialist subject knowledge.

1.1.2 Research questions and aims

Initial questions with regard to this study were based upon such thoughts as: Why was there a lack of recorded knowledge? What kinds of knowledge appear lacking? How would acquiring such knowledge be best approached? Who would hold such knowledge in order to address the problem? In relation to text typeface design process, this study is concerned with main research question:

Can knowledge of text typeface design process be revealed and if so can this be explicated theoretically?

In relation to the questions and concerns of this study, the aims of this research are as follows:

1. To reveal and describe processes of text typeface design from accounts given by type design experts.

2. To evaluate whether it is possible or not to construct theory or theories of type design process from the accounts of practice and procedure given by type design experts.

3. To offer possible, descriptive and/or generative theory/theories that will allow further study to develop in the area of text typeface design process as well as informing practice.

1.2 Contextual and historical framing for the research

Often perceived as related to the subject domain of typography, typeface design is a specialist area that concentrates on the designing of letterforms, characters, or glyphs conceived to work in relation to one another within specifically designed sets. These are, in turn along with spacing, designed relative to the glyphs, presented as a group of accessible functioning entities in the form of a font*. Today, overwhelmingly, these are in the form of fonts delivered as small computer software packages.

Text typeface design seemingly poses a somewhat paradoxical initial problem for the designer – in order to begin to see how a typeface may become whole, a designer must begin with looking at detail first by way of individual character design or details of character designs. Ultimately, a typeface must work on both micro and macro levels simultaneously – on the level of detail of the individual characters that make up that typeface and on the level of how these individual characters appear and behave when combined with spacing to form words, sentences and paragraphs.

Text type designers must also work within obvious constraints. This study relates to the Latin character set. There are constraints of adherence to forms recognisable as accepted letterforms for use within a given range of language settings/expectations. There are also constraints that govern issues relating to the legibility and readability of characters when set as words and sentences at small reading sizes. Text typeface design must adhere to certain or particular norms for any given group or set of languages for which a character set may be deemed appropriate to represent. Therefore there is something of a notional precedent in relation to acceptable form imposed upon the design problem from the outset.

The constituent parts that make up a typeface design must work independently of each other but also harmoniously when combined in any possible combination. These may include various glyphs: letterforms – both lower and uppercase, numerals, punctuation, diacritical marks*, symbols and any associated spacing* required in order that glyphs are positioned appropriately in relation to each other when in use. Therefore, this study interrogates expert designer knowledge of the design process in relation to designing and/or making of text typefaces. The study does not concentrate per se on the creative or conceptual development processes toward letterform design. Neither is it concerned with the design of types intended exclusively for use as display types, individual letter designs or lettering and calligraphy etc. This research is concerned however, with knowledge in relation to developing letterforms or generalizations regarding the designing and development of letterforms, that are intended as being part of a set or group of associated forms that will in turn become a text typeface design.

Early works relating to the subject of devising types also account for the crafts and trade of punch-cutting and type-founding (Moxon, Davis & Carter. 1958; Fournier, Carter & Mosley 1995). Of these early activities and professions, the punch-cutting of letters was regarded as one of the more highly skilled, if not the most highly skilled crafts. It is also acknowledged distinct divisions of labour existed between such activities (De Vinne 1900, p.11). Punch-cutters worked in minute detail to punch, counter-punch and engrave the ends of steel bars in order to make reversed letterforms, that when struck into a softer metal such as copper, could be used as a matrix (Southall 2005, p.3–4). This matrix would then be incorporated into a mould in order that a single lead type might be cast from it, these types being cast one at a time (Moxon, Davis & Carter 1958, p.134–184). The process of punch-cutting and casting the moulds would have to be repeated for every individual letter or character needed to create a font of type, each related by the characteristics commonly recognised as being distinctive to any given particular typeface or design.

Divisions of labour between the various stages in the process and manufacture of types meant that the design of letters, the cutting of punches

and the casting of types could be conducted by different workers. However, prior to the late nineteenth century and the invention of photographic transfer, there was no method to reduce the design of model letters to appear at text size on the ends of the small steel bars from which punches could be made (Southall 2005, p.13–17). Early designs could only be used as a guide and would need to be interpreted by the skill of the punch-cutter.

By the end of the nineteenth century, the move toward industrial mechanization in many areas, meant the cutting of punches by hand was supplanted by mechanised methods of production (De Vinne 1900, p.348–350). This move toward industrialisation brought with it a clearer separation in the division of the designing and making of type (Southall 2005, p.19). Drawings relating to the designing of types became less of a guide, as was the case of model letters for the earlier hand punch-cutters, but from this point become the machine pattern or specification of the final letter designs for types.

As technologies advanced with time, the manufacture and use of metal type eventually gave way, by and large, to photo-type and typesetting. The designing of types or what could be described as the type-image became closer still to what would appear as the final form or delivered image of the type. Within the last few decades, digital type has become the common form of reproducing typographic matter for print and on-screen renderings. The removal of the image of the letter as photographic film from the process of production has meant that designers today are working with digital media with the forms of letters directly within the medium in which they will be delivered. Today the type designer is able to work with outline Bezier curves and/or coding/programming, producing outline digital type-forms as they may appear in final products – the digital drawings become the resultant typefaces within a font. This affords contemporary typeface designers to work closer in connection with the delivered form or product of their design than at any other time.

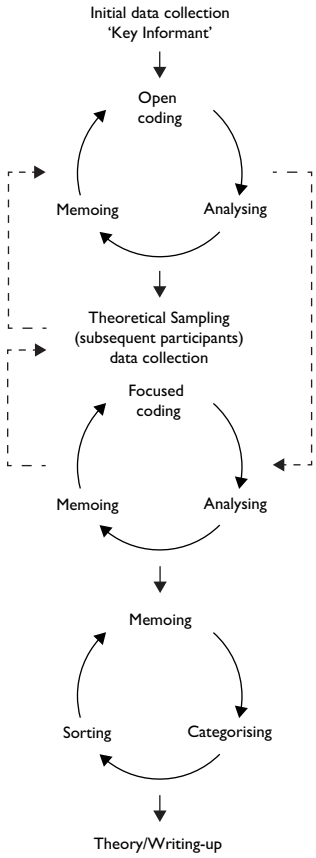


Figure 1.1
Diagram showing the overview of the research design adopted for this study. NB. cyclical steps not linear development from coding to theory generation.

1.3 Methodology

This research adopts a qualitative Grounded Theory (Glaser & Strauss 1967) approach as a general method. This is a simultaneous method of enquiry and analysis toward collected data in order to develop theory. This is discussed in full in 3.0 Methodology. An initial 'key informant' (Goulding 2002, p.60) was utilized to initiate and orient the data collection, this facilitated continued 'theoretical sampling'* (Glaser & Strauss 1967), where sampling is determined on the basis of the emerging data, analysis and theory development (section 3.4.1), in accordance with Grounded Theory Methodology. Comparisons and differences from the given expert accounts focus the analysis in relation to developing description and theory that elucidates contemporary expert text typeface design practice. It is anticipated that the Grounded Theory generated in this study will aid in the future description and articulation of text typeface design process. This may prove to be of value in terms of a descriptive and generative nature in approaches to practice, education and further research enquiry.

This study began with what the author identified as an emergent 'sensitized' (Given 2008, p.246) focus in relation to a lack of recorded expert knowledge. Grounded Theory Methodology involves systematic but nonlinear processes. This includes the collection and coding* of data via theoretical sampling, analysis by means of constant comparison* and raising concepts that become theory through memoing*. In turn this leads to developing theoretical categories, the sorting of categories and the writing up of research. This has resulted in three significant theoretical renderings as 'core categories', that describe specific aspects of text typeface design process. These are: **Trajectorizing** (chapter 4.1), **Homologizing** (chapter 4.2) and **Attenuating** (chapter 4.3). Figure 1.1 is repeated from section 3.1.1 where the research design of this study is discussed further, it illustrates a model of the structure of the research design this study adopted and illustrates the nonlinear nature of the Grounded Theory Methodology.

As an addition to Grounded Theory Methodology the author developed a supplemental method of memoing – Empathic Memoing. This is described in full in 3.7.2 and makes a new contribution toward existing Grounded

Theory Methodology. By means of undertaking aspects of participants' described practice, Empathic Memoing afforded the author to develop richer and clearer understandings of participant's descriptions of practice through engaging in practice as a form of analysis. This in turn allowed the author to develop 'empathic' memos, leading to the generation of conceptual coding and categories. These in turn became integrated within the developed Grounded Theory.

1.3.1 Participants and data

The sample for this research consists of high profile text typeface design experts. The participants were selected in accordance with Grounded Theory Methodology 'theoretical sampling' (Glaser 1978, p.36). The focus on such expert participants within this study was in order that insight to their knowledge of text typeface processes could possibly yield richer descriptions of understanding and articulations. The use of experts in this sense is advocated by Nigel Cross in developing a greater understanding of design knowledge generally 'In some instances it will be necessary to study outstanding, or exceptionally good designers. This is analogous to studying chess masters, rather than chess novices…' (Cross 2007, p.85). The use of experts allows their voices to be heard in relation the aims of this study via Grounded Theory Methodology. Developed theory and descriptions thus arise from, and are grounded by, expert participant testimony.

The interviews conducted as part of this research enquiry form a unique contribution to knowledge in themselves as a body of 'rich data' (Silverman 2006 p.110). Twelve in-depth interviews with nine participants totalling approximately fifteen hours of recorded, transcribed, coded and analysed data from which theory is developed is included in this study. All interviews were recorded as high quality digital video. From these, all interview dialogues within the video recordings were transcribed by the author. These were duly coded and analysed according to Grounded Theory Methodology. This in turn helped organize and manage the higher order theory development that emerges from this research.

1.4 Terminology

A glossary has been included should it be necessary for the reader (p.238). Some of the terminology within this research report is comprised of specialist language around three main areas. These are: Type and type design, this includes what may be deemed professional language and nomenclature related to letterforms and parts of letterforms; Grounded Theory Methodology, this includes some expansion on the definition of terms; Finally, terms for the theory generated in this research. This will give an overview of the theoretical labels devised in rendering theory specific to this research. The terms are developed to delineate the specific concepts they represent, not to align with terms of current practice per se.

1.5 Thesis chapters

This thesis report is comprised of six chapters as outlined below:

Chapter 1.0 Introduction

This chapter introduces the research report by means of contextualization. It introduces the research aims, outlines the background against which the research theme developed and gives direction as to how the research report is structured.

Chapter 2.0 Literature Review

This chapter is a review of the literature as pertains to the identified research theme. This chapter identifies the gap in recorded knowledge that exists in the literature relative to the identified research theme. This includes a discussion of the perspectives from which accounts of practice have been written with respect to the history of the subject matter.

Chapter 3.0 Methodology

This chapter reports on the selection and evaluation of the research methodology – Grounded Theory Methodology – and the constituent research methods employed in conducting this research. This also includes a description of an original contribution to knowledge in terms of the author's developed method – Empathic Memoing.

Chapter 4.0 Processes of text typeface design

This chapter presents the Grounded Theory developed in this research. This includes inductively generated core-categories, sub-categories and substantive coding, whilst grounding the theoretical descriptions in relation to the collected primary data. This chapter is divided into four sections as follows:

4.0 Introduction

Provides an overview of the analysis and interpretation of the gathered research primary data that is resolved in the form of developed Grounded Theory.

4.1 Trajectorizing

This sub-chapter provides theoretical explication as to how the text typeface designer initiates, negotiates and directs the early stages of text typeface design.

4.2 Homologizing

This sub-chapter provides theoretical explication concerning actions and decisions relating to developing relational qualities within the emerging forms of text typeface design.

4.3 Attenuating.

Provides theory describing the ways in which expert designers continuously and critically test and adjust for incongruity in developing text typeface designs.

Chapter 5.0 Discussion

This chapter discusses the three core categories presented in chapters 4.0, 4.1, 4.2 and 4.3. This includes the relationship and interrelationship of the main themes that arise within the categories. Aspects from the literature relevant to the developed theory are discussed alongside additional relevant references from the data where pertinent or necessary. The Grounded Theory is extended to provide visual modelling in the form of diagrams that give an overview of text typeface design process.

Chapter 6.0 Conclusion

This chapter concludes the thesis report by summarizing and stating the contributions made by this research. This includes how the contributions align with the initial aims of the research. The conclusion outlines a total of twenty original contributions to knowledge.

This chapter also considers possible future implications of the Grounded Theory developed in this study. Indicated are the possible implications and opportunities the theory may offer and support in terms of future research, pedagogy and practice.

Figure 1.2 on the following page provides a map of the thesis chapters.

Thesis chapters

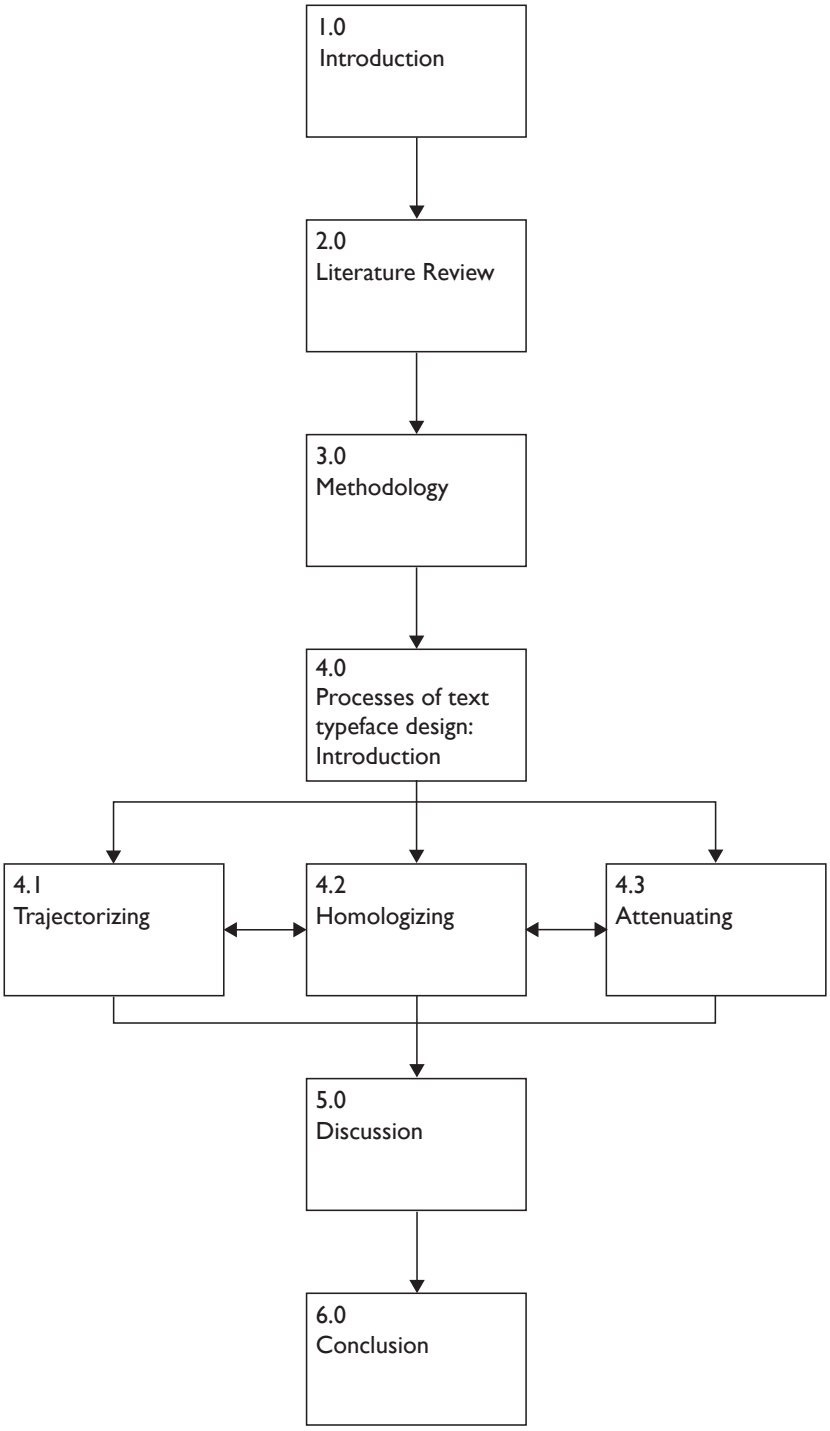


Figure 1.2
Map of the thesis chapters.

2.0 Literature Review

Contents

2.0 Literature Review

> Letter-cutting is a Handy-Work hitherto kept so conceal'd among the Artificers of it, that I cannot learn any one hath taught it any other; But every one that has used it, Learnt it of his own Genuine Inclination. Joseph Moxon – Mechanick Exercises on the Whole Art of Printing (1683–84), (Davis & Carter 1958, p.87)

2.1 Introduction

Type design is often a lengthy and solitary endeavour on the part of the designer. An endeavour which, there is little in terms of guidance to draw upon regarding the processes involved in the designing of type. Few books or resources exist detailing the processes of this subject – this is both an historical and contemporary problem.

There exists no contemporary single reference showing a range of processes of type design; that identifies and details a range of working practices from a range of designers, including their explanations of, and reflections on these processes. This is especially true of the design of text typefaces, in which considerations of design must be treated with greater care in relation to the functionality of type, which must appear legible and optically stable at small reading sizes.

General anecdotal accounts can be found within professional graphic design and typographic publications in addition to online accounts that inform of many typeface designers claiming to be self-taught (eg. Middendorp 2010, p.33). Many typeface designers also regard themselves primarily as graphic or typographic designers. There is currently a healthy commercial type industry served by many proprietary and independent type foundries.

In relation to type and typography, there is a substantial body of work to draw upon in other aspects, such as: legibility, technology, history, biography, culture and artifice (the visual manifestation) of type itself. This literature review will firstly outline and examine significant contributions to

knowledge regarding type design process and how this has been accounted for. Secondly, studies of knowledge in relation to the wider field of design will be discussed. Thirdly accounts of design process and knowledge relating to a wider field or design research will be examined.

These areas have a bearing on the present research, which will focus on elucidation of knowledge with respect to the text typeface design process.

2.2 A lack of specific documented knowledge in relation to the processes of text typeface design

A lack of published material relating to typeface design is acknowledged by the marketing claim for the book *Designing Type* by Karen Cheng:

> The lack of a specific and comprehensive guide to type design has long been a frustration for typographers, graphic designers and students. Designing Type finally addresses this important need – and brings new depth and insight to the art and process of creating a typeface.'
> (Cheng 2005)

Cheng's book contains some useful information toward the grouping of some related letter shapes. However, it is questionable whether this brings insight and depth in terms of the process of designing typefaces. The book's core themes are based around comparative analysis of existing typeface glyphs with some commentary toward methodological approach.

Work published offering some insight towards aspects of the processes involved, appear in some sole-authored books (eg. Gill 1931/2007, Van Krimpen 1957), or as features within trade journals, eg. *Typografische Monatsblätter* and ITC's *U&lc* Magazine, the latter tended to coincide with the release or publication of the typeface/font from the foundry, acting as a promotional vehicle also.

None of these works deal directly with establishing and describing a range of contemporary design processes relating to text types. They often offer historical or retrospective views, describing specific details relating to designing type or the manifest design of the types themselves.

2.2.1 Examples of restriction of type-founding as a practice and the secrecy of punch-cutting as possible contributors to a state of paucity in epistemological articulation.

In connection with type design, the earlier related activity of type-founding suffered restrictive measures placed upon it by the state. There are also accounts of type-founders purposefully concealing methods of practice from those who worked around them. (Reed 1887 – Johnson 1952, p.311).

Restrictions in terms of the numbers of type-founders allowed to openly practice, along with restrictions of who they could employ and in what capacity, meant that type-founders could not, or would not, be able to freely communicate their knowledge regarding the processes of punch-cutting for making types. The Star Chamber Decree of 1637 detailed restriction in the number of type-founders in England to four. The maximum number of apprentices type-founders could have under their employ was restricted to two (Reed 1887 – Johnson 1952, p.120). The decree imposed in the UK was regulated by the Stationers' Company London and the law courts, and was based upon an earlier decree of 1586. The Decree of 1637 was a measure to restrict activity of printing and type-founding and as a consequence of this, the knowledge which would have accompanied this.

An anecdotal account given by Reed (1887) in connection with the secrecy of punch-cutting from the mid 1700s, is given with regard to Joseph Jackson, apprentice to William Caslon I. Caslon's punch-cutting was carried out in secret at the Chiswell Street foundry. The account relays that Caslon and his son would lock themselves in a separate room whilst practicing the work. Apparently, so much was Jackson's desire to learn about the process, that he bored a hole in the wainscot to observe his master at work. From his observations Jackson was able to apply himself to the practice in his own time, and on the completion of creating a single punch, presented this to his master in the hope to find praise and reward. Caslon's response was the dispensation of a hard blow to the apprentice and threatening him that he would be sent to 'Bridewell' (at the time both a court and prison) if a similar attempt was made. (Reed, 1887 – Johnson 1952, p.311).

The restrictions imposed by the 1637 Star Chamber Decree and the above account of Joseph Jackson implies that meaningful knowledge and methods in relation to a process did or could exist with regard to punch-cutting. As such, these methods etc. of process could be observed, taught and communicated. However, this is not to say that mastery of the subject could be expedited in such a manner.

In the later edited, full version of Moxon's *Mechanick Exercises*, Davis and Carter give brief historical accounts where it has been known of imparting knowledge relating to punch-cutting (Davis & Carter 1958, p. 375). However, it is not made clear how such knowledge was passed on, only that such activity existed.

2.2.2 Extant texts in relation to typeface design process

Of the literature that offers insight to aspects of process of typeface design these do so from an historical perspective: *Letters of Credit* (Tracy 1986) gives some important insights into some aspects of processes of typeface design particularly on spacing letters. However, the content here is significantly historical and does not offer theory toward the development of form. Smeijers' (1996) *Counterpunch* contains some thoughts toward issues regarding handling form and ground and the relative balancing of positive and negative space within and between letterforms – issues that transcend technologies employed in the designing of typefaces. Smeijers also draws heavily from the writing of Fournier, at times setting aspects of this to the practice of punch-cutting as part of his contemporaneous investigation. Southall's (2005) *Printer's type in the twentieth century* describes some elements of the processes of type design. However, here the view is heavily based on the role of technology over a specific period in history.
None of the above works deal directly with establishing and describing a range of contemporary design processes relating to text types. They offer historical or retrospective views, describing some specific details of form relating to type design.

Where information relating to the subject does exist, it is usually limited

and/or incidental in nature (De Vinne 1900; Earls 2002; Graß 2008; King 1999; Klein, Schwemer-Scheddin & Spiekermann 1991; Tracy 1986), this is often contained in or found alluded to within books that cover a wider or broader scope including lettering (Kapr 1983; Harvey 1996; Noordzij 2000, 2005). There is usually an emphasis on historical factors relating to type design (Morison 1926; Updike 1937; Johnson 1966), changes, developments and paradigm shifts in technology (Knuth 1986; Karow 1998; Morris and André 1991) and/or biographical accounts (eg. Burke 1998; Carter 1995; Lommen 2003; Macmillan 2006). Other texts offer glimpses of fixed or ideological perspectives from the point of the practitioner/author (Gill 2007; Goudy 1940; Hartz 1958; Unger 2005; Van Krimpen 1957), including reflections on methods employed in practice itself (Briem 1998–2001; Harvey 1996), those that relate specifically to the use of particular technologies (Sassoon 1993, 2002; Karow 1998; Knuth 1986; Moye 1995; Lemon 2005) and accounts that relate to specific aspects of form or visual qualities in type (Carter 1937; Dertrie 1999; Hersch 1993).

Studies of printing and type-founding that make reference to process, three early substantial accounts exist: Moxon's 1683 *Mechanick Exercises* (Davis & Carter 1958), Pierre Simon Fournier's 1760s *Manuel Typographique* (Carter & Mosley 1995) and Legros & Grant (1916) *Typographical Printing Surfaces*. Aspects of these accounts are important to consider for some particular details and also in relation to each other because they allow us insight to the perspectives from which they were written, these will be considered in further detail below.

2.2.3 Etic and emic accounts in relation to type design processes

Anthropologist-linguist Kenneth L. Pike (1967) coins the words etic and emic from the words phonetic and phonemic, in relation to what is his 'Tagmemic Theory' (Pike 1967). The concepts of etic and emic have since found application in subject domains such as Ethnology and Psychology. Pike describes etic and emic as:

> The etic viewpoint studies behavior as from outside a particular system. The emic viewpoint results from studying behavior as from inside the system. (Pike 1967, p.37)

And that in terms of partial versus total data:

> Etic data are obtainable early in analysis with partial information. In principle, and on the contrary, emic criteria require a knowledge of the total system to which they are relative and from which they ultimately draw their significance. (Pike 1967, p.39)

An expert in any given field can then be said to inherently have an insider perspective in their subject. Conversely, the non-expert, who lacks the depth of skill and knowledge of the expert, will have an outsider perspective.

It is useful to consider Pike's view of the etic and emic in relation to the literature that exists in relation to type design. Accounts that exist in relation to text typeface design, either come from the 'inside' expert view of the type designer, or from the 'outside' non-expert view of the observer. A tension exists here similar to which has been commented upon within areas of social science and anthropological research:

> For what the social scientist realizes is that while the outsider simply does not know the meanings or the patterns, the insider is so immersed that he may be oblivious to the fact that patterns exist. (Wax 1971, p. 3)

It is the social scientist's task to work between such etic and emic viewpoints in order to communicate and illuminate what has been learned. Patton (2002) comments:

> Experiencing the setting or programme as an insider accentuates the participant part of participant observation. At the same time, the inquirer remains aware of being an outsider. The challenge is to combine participation so as to become capable of understanding the setting as an insider while describing it for the outsider. (p.268)

This may highlight some ways towards an understanding of why there is a dearth thus far in describing text typeface design process. The immersed insider could be considered too close to specific details and problems in relation to the activity to see clear ways of making meaningful generalizations of the process of type design. It is not only what is done ie., procedure that needs to be explained, but how and why things are done in relation to this.

Although typeface design is a complex and often lengthy practice, it can often be difficult even for graphic designers and typographers who work closely designing with type, to appreciate such 'meanings' and 'patterns' as alluded to by Wax and Patton.

Type design, although a specialist activity in its own right, can perhaps also be perceived as a discipline within disciplines, an activity that serves the broader specialisms of typography, graphic design, communication design, media and new communication technologies. To an outsider, there is perhaps a certain sense of invisibility that discrete specialisms such as typography and type design exist, when superficially these would appear to be closely related.

A distinction between perspectives can be illustrated by a criticism made by the Dutch writing master and type designer Gerrit Noordzij against Daniel Berkerly Updike with regard to what is considered by many to be an authoritative history of type designs, first published in 1922 – *Printing Types: Their history, form and, use; A study in survivals*:

> The judgement of Updike is amazing and perhaps, if you would happen to enjoy a very special sense of humour, even amusing, but everywhere it demonstrates painfully the absence of the most elementary understanding of type design and its history. (Noordzij 2000, p.63)

Noordzij makes this statement from the perspective of having a life and career immersed the creation of letterform, type design (Smeijers 2003, p.8) and teaching. Although his own typefaces are not widely published (Middendorp 2004, p.150–157), he draws upon his expert knowledge in his criticism of Updike.

Noordzij's knowledge of type design from the perspective of a type designer puts him at odds with Updike's view of type design as a type historian and printer. Although appearing closely related in terms of subject and discipline, the world views of this particular type designer and historian differ. Noordzij's insider perspective does not align with Updike's outsider one on the subject.

2.2.4 Etic 'non-expert' accounts of process and type design

Some well established accounts of process that include letterform and type design have been made from the perspective of observed practice. These at times, sought to improve upon what existed regarding accounting for practice, with the intention of influencing and improving practice itself.

Joseph Moxon's *Mechanick Exercises*, detailing printing and typefounding, was originally published as part-works that began to be issued in 1683. This was the second volume of his 'works', the first being devoted to other trades appeared during 1677 and 1678. According to Davis & Carter (1958), the book is the earliest known manual of printing in any language, that accounts traditional knowledge associated with the practice, and pre-dates any other by forty years. (p.vii)

Within *Mechanick Exercises* (Davis & Carter 1958), Joseph Moxon assumes a scholarly perspective, giving in-depth observational accounts regarding the whole art of printing. What Moxon describes in relation to type, are the processes of letter-cutting, the processes of designing the letterforms are not explored to any great extent. However, what does appear in relation to letterform design (figure 2.2.4.1) is also clearly based upon an earlier book by the same author, intended to instruct the reader on the construction of letters by the use of geometry – *Regulae Trium Ordinum Literarum Typographicarum* (Moxon 1676) (figure 2.2.4.2). This in turn, references the work of Albrecht Dürer's *Underweysung der Messung, mit dem Zirckel und richtsheyt/The just shaping of letters* (Dürer 1535/1965) which also uses geometry as a method in constructing letterform (figure 2.2.4.3).

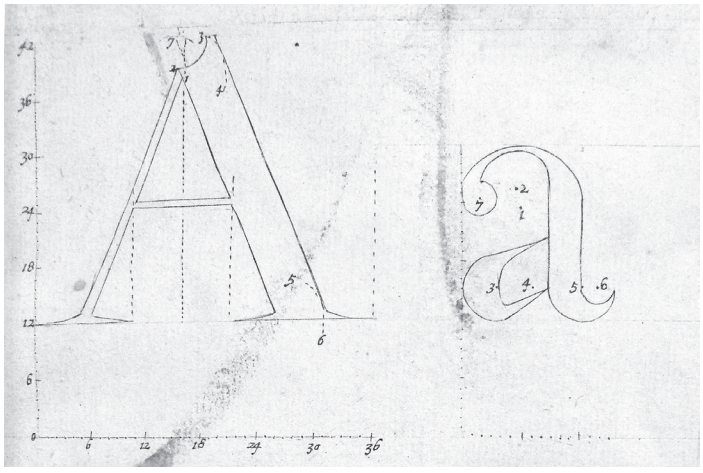


Figure 2.2.4.1
An example from Moxon's treatment of letterform description in *Regulae Trium Ordinum Literarum Typographicarum* (1676).

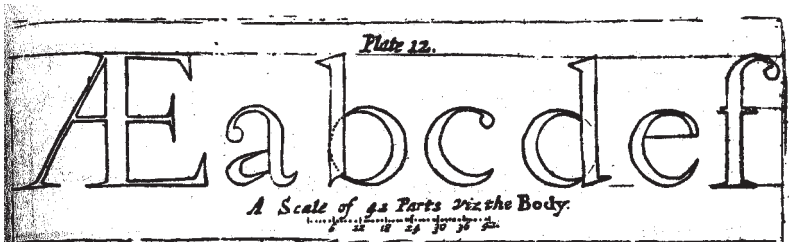


Figure 2.2.4.2
From Moxon's *Mechanick Exercises* (1683). Adapted from *Regulae Trium etc.* (1676).

Figure 2.2.4.3
From Dürer *Underweysung der Messung* etc. (1535).

Rather than someone with expert subject knowledge, Moxon offers forced fixed constructs as to how letters should be designed. His views are based upon his observations of the letterforms he deems to be the work of an expert, namely Christophel Van Dijk. Moxon's descriptions of letterform are fixed by a grid system of 42 squares and complex geometry. These fixed exemplars highlight Moxon's lack of expert knowledge in this area. There is no account within Moxon's work of how the transference of the detailed geometry of such drawings would relate to producing punches in steel. Punches needed to be chiselled and counter-punched from the end of a small steel bar in order that a text size letter could be produced.

This early form of what may be described as etic accounting and attempting to fix knowledge is also to be found in the work of the French Académie of Sciences. Six years prior to Louis XIV's reorganisation of the Académie in 1699, a working party was set up and given the task of organising the *Description des métiers,* to describe all the techniques used in the practice of the arts. The first of these was the art of printing. From this eventually came the description and apparent improving of the construction of letterforms intended for use in printing. These letterforms appeared in the form of engravings of model letters onto copperplate. Eventually, a grid structure of 2304 squares was adopted (figure 2.2.4.5) along with complex geometry to construct the letterforms (Jammes 1965). The first punches cut by Grandjean

in 1699, for the *Romain du Roi* types, are based on Simonneau's early copperplate engravings of 1695. Fournier comments that Grandjean modified the designs considerably, at times disregarding them completely in creating the punches for the Romain du Roi (Fournier, Carter & Mosley 1995, p.10). However, accounts given of the work in association with the Romain du Roi, along with the engravings created as model letters, do not reflect expert knowledge of the practice in terms of process, but seek to superficially fix description of form by means of geometry in relation to letter design. The intention here being – and similar to that of Moxon – that this would provide a rational, or measurable, scientific basis from which types could be created. Again, as with the case of Moxon, there appears no evidence that such detailed geometry was of any use to the making of the letterforms in terms of how these would manifest from punches for types.

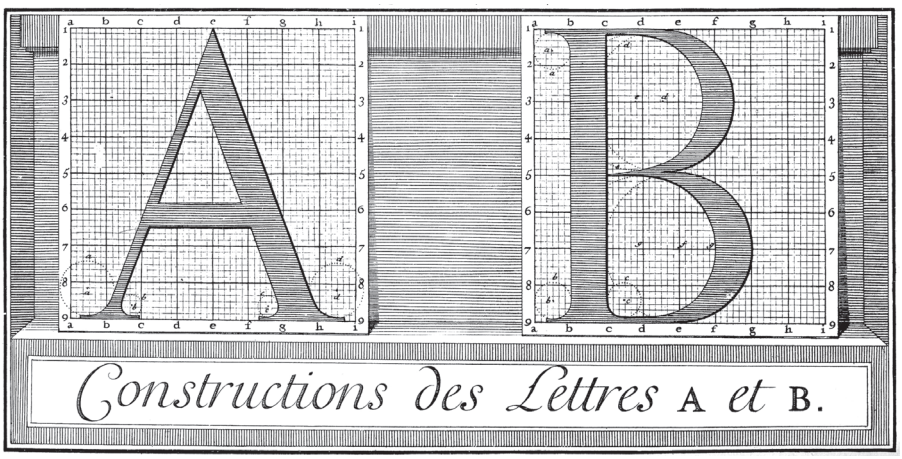


Figure 2.2.4.5
An example of the 2304 square grid structures engraved by Simonneau for the model letters.

A further major account that appears to give an etic perspective can be found in Legros & Grant (1916) *Typographical Printing Surfaces*. This concentrates heavily on printing technologies and associated applications of engineering. The short chapter devoted to type design offers very little insight, if any, concerning the process of type design. This chapter mainly discusses optical illusion (Figure 2.2.4.6), then moves toward a discussion and critique of the serif in its various forms. Aside from some optical considerations, the lack of specific subject insight affects what is communicated. The chapter appears ill informed and superficial in terms of specific subject knowledge.

These 'etic' accounts are constructed from the position of observer(s) or those outside of the expert practitioner's view of type design. They seek to give clarity to a specialist subject domain, of which they arguably display insufficient personal knowledge (Polanyi 1969, 1973) when compared to other specialist or expert accounts of the subject. Yet because of their reputation as authoritative texts, these established accounts are still consulted by those wishing to gain insight into the processes of typeface design. This is not to say that these are not important accounts with respect of their depth and breadth. Their value lies in the technical recording of proposition, process and technology in relation to the designing of types – not the designing of text typefaces as a discrete area of knowledge, activity and specialism in itself.

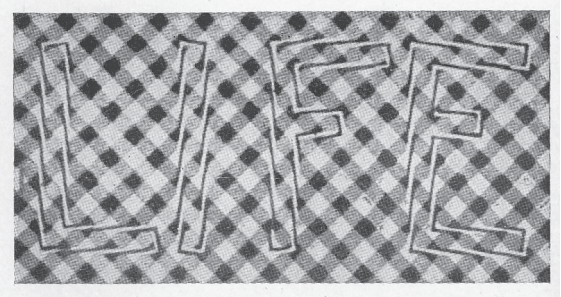


Figure 2.2.4.6
An example of Legros & Grant's figures from their chapter on type design.

2.2.5 Emic 'expert' accounting of process in punch-cutting and type founding

The early account of practice given by Pierre-Simon Fournier (1764–66) attempts a similar breadth to that of Moxon. Published approximately eighty years later than Moxon's, and without apparent knowledge of this (Fournier, Carter & Mosley 1995, p.9), its content affords a rather different perspective. Fournier does not strive to improve upon existing practice but is more insightful by describing his own.

In his treatise, Fournier appears highly critical of the methods employed in describing letterform by the French Académie of Sciences. He dismisses the geometric work saying that 'Genius knows no rule or compass, save in mechanical work.' (Fournier, Carter & Mosley 1995, p.9). If Moxon's experience or skill as a punch-cutter was ever in doubt, the same cannot be said of Fournier. He draws on his expert experience and knowledge in his criticism of the French Académie of Sciences.

Fournier clearly describes different approaches to making counterpunches and how these should be considered. He gives account of the counter punches for certain letters such as 'bdpq' and 'h, n and u' as being common to these groupings of letters, whilst letters such as 'i, I, l, r, and others need no counter punch (Fournier, Carter & Mosley 1995, p.29). In doing so he intimates a system within his working practices. This description contrasts with that of Moxon and the French Académie of Sciences – theirs' being fixed in geometry. Fournier's articulation can be interpreted in part, as a discrete system, one that begins to describe an approach that considers an holistic or macro view of commonalities as well as the micro detail level of singularities. This intimates an implicit system, one that identifies pattern and the opportunity for the adaptation of pattern in terms of counter-form. Fournier begins to describe a procedure that may point toward the possibility of describing a formal method. This comes from his intimate knowledge of his practice. Fournier is able to explain this in clear terms and generalize about specifics, thus creating a description of possibles and probables. What Fournier describes is flexible and adaptable, yet essential knowledge required in the construction of the letterforms for punch-cutting. Fournier's account affords us greater insight into procedure than the earlier accounts given by others. However, descriptions are not always complete and at times not offered at all. Whilst he comments upon procedure he does not offer a description toward the form of letters as found in the accounts by Moxon and the French Académie of Sciences. Regarding the form of letters Fournier states:

> As to the best possible shape to give to letters, it is useless to write of it: it is a matter for the taste and discernment of the cutter, and it is in this that he displays his proficiency or his incapacity. It is a safe rule that he should do nothing without a correct understanding of the design of letters, or having good models before him to allow him to catch the fashion of them. (Fournier, Carter & Mosley 1995, p.38)

Fournier's refusal to comment on the design of lettering for typefaces may serve as an example of the difficulty in describing complex experiential knowledge. However, there is perhaps further significance in this statement. Fournier identifies a personal or ideological view: 'As to the best possible

shape' (Fournier, Carter & Mosley 1995, p.38). This is different from: 'It is a safe rule that he should do nothing without a correct understanding of the design of letters' (Fournier, Carter & Mosley 1995, p.38), which implies the possibility to learn or understand. Fournier's use of the word 'correct' suggests needing thoroughness of understanding. However, it is difficult to interpret whether he suggests that understanding is developed by accretion – through immersion in the subject, or that acquisition of knowledge may be expeditiously achieved through understanding schema etc. in relation to letterform. Fournier's use of the word 'design' is also of significance here. This suggests that Fournier has some knowledge or awareness of constructing or constructed letterforms specifically useful for the production of type. Knowledge of form that is necessarily different from other kinds of traditional lettering, although these may be related.

The above example of Fournier helps in illustrating problems in describing the depth of knowledge that become second nature to the expert. This is opposed to the highlighted accounts of Moxon, The romain du roi and Legros & Grant that offer clear descriptions but of an apparent non-expert nature. The latter appear to lack the 'personal knowledge' that may be associated with the expert in the subject discipline.

2.2.6 Elucidated understanding, decision-making and described method in relation to type design process

The separation of the process of the designing of types and the making of them is acknowledged and accounted for by Theodore Low De Vinne (1900). He develops the notion of designing further. De Vinne not only appears to regard punch-cutting as the highest skill but eludes to the designing of the letterform being more important yet:

> Punch-cutting is the first process, which must be preceded by a careful drawing of the characters. No operation in typography requires more skill than this, and in none is error more disastrous. (De Vinne 1900, p.11)

De Vinne's account for the making of text types is also of interest. His references include Moxon and Fournier, and it is indeed Moxon's study

that he refers to when describing the marking out of a framework on the commencement of punch-cutting to determine the position and height of each character. De Vinne does stop short however, in agreeing with Moxon's description of letterforms as needing to be of geometric construction. He explains that 'Optical delusions must be humored' (De Vinne 1900, p.14). He continues to describe how curved letters must be extended slightly above and below the height of letters with a flat base or top, otherwise they would appear too short. Again, these are helpful glimpses toward process and understanding in terms of decision-making. His account of punch-cutting draws from an earlier period of punch-cutting by hand and specifically the account given by Fournier. This is in contrast to the available technologies at the time of his writing. He does however, account for the available technologies of the day, including mechanized apparatus for the 'reproduction' of letterforms employed in type production. eg. Leavenworth's 1834 adapted pantograph, for scaling the 'model letter' for the production of wood-types (De Vinne 1900, p.348); and notably, the Benton Punch-cutting Machine (De Vinne 1900, p.350) for its precision in facilitating the cutting of 'models' for letters for metal text types. De Vinne does not mention if the technologies in themselves affect or impact upon how the letters for types are designed, or should be designed in terms of form or process.

One of the clearest glimpses of insight towards designing that marks a distinction in the early twentieth century practice is given by William Addison Dwiggins (1940) – *WAD to RR: A letter about designing type*. The 8pp publication (without pagination) is an expanded version of a letter originally sent from Dwiggins in 1937 to punch-cutter Rudolph Ruzicka, who according to Dwiggins in his short introduction to the letter – 'wanted to know how one went about designing a typeface.' (Dwiggins 1940).

Much like Fournier's description of counter punch-cutting, Dwiggins gives insight into what could be considered – in part – a system of working. He describes a technique used in making his Falcon type, whereby he created small stencils in celluloid as parts of the letterforms in order to arrive at the characteristics of the typeface design (figure 2.2.6).

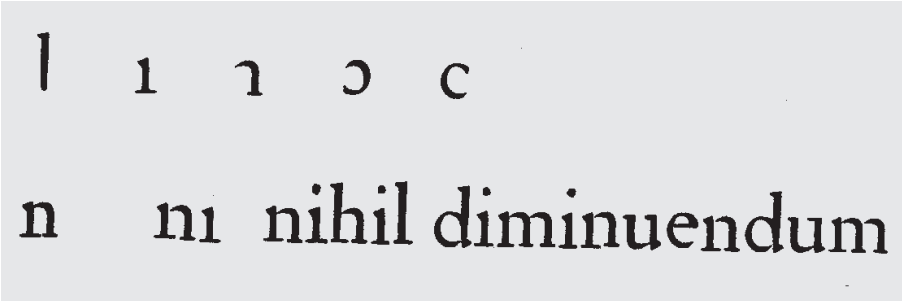


Figure 2.2.6
Dwiggins's Falcon type stencil-like letter parts. The top line shows the elemental component parts. Bottom line shows the combining of parts to create letterform.

These consisted of a single long upright stem*, a short stem, the n arch and a loop. Once enough small characters were created using these parts of letters, larger templates were made in order to make working drawings – evidence of an elemental system. The letter also explicates Dwiggins' thinking regarding which characters can be useful when beginning a type design:

> I have Griff [Chauncey Griffith] cut and cast two letters – the ones that will tell you the most. I like n, and p, d, or b, a straight one and a looped one. Maybe h p would be best. (Dwiggins 1940)

Dwiggins further explains that when dimensions are settled, the alphabet is then worked up, drawn on thin bond paper. This is drawn freehand and further rationalized later by the drawing office. Dwiggins also makes a brief account of 'fitting'* letters – determining the amount of side bearing* space each individual letter requires. In relation to this he states, 'I have a hunch that a "coarse" formula could be worked out' (Dwiggins 1940). The notion of a formula is again, evidence of an intimated system proposed by Dwiggins, one that not only allows insight to 'what' the designer has done and 'how' but also, 'why' he has chosen to do things in such a manner.

A similar glimpse toward decision making, method and system is also offered by Frederic W. Goudy in *Typologia* (1940). Goudy's account allows insight into his method of establishing initial principles for designs that then have an impact on the remainder of the typeface design:

> My drawing of the lowercase p permits me to strive for a movement in the round member – a movement that I attempt to retain throughout the face – to decide whether it shall be round or more or less oval in form, where the stress of color shall come, the ratio of stem to hairline, and a thousand and one matters that come and go in my thoughts as I draw. (Goudy 1940, p.83)

The cases outlined above are important in that they begin to show some insights into the designer's thinking in relation to their working practices. They also allow glimpses of what may be method or patterns of behaviour relative to practice.

Extant explanations that do cover in some detail the designer's working practices and approaches take the form of a small number 'how to' texts (eg. Briem 1998–2001; Harvey 1996; Moye 1995). These have some commonality in that they offer methodological guidance and insight to the approach of the author as designer but they do not specify a particular process, or whether such processes exist. These accounts may offer 'how' or 'what' to do but lack important 'why' and 'when' that is necessary for developing or establishing theory or theories of process.

In terms of communicating process or theory with respect to type design there is still little evidence to be found to date that exists, particularly in terms of research. Efforts towards establishing theory have been made in other areas of design and in particular the disciplines of architecture, product design and engineering design.

2.3 Describing design knowledge

> In his Metaphysics Aristotle states that we consider the master workers in each craft to be more honorable and wiser than the manual workers because the former know the causes of the things that are done…''… In this connection Aristotle states that the master workers are wiser not because they know how to act but because they have a knowledge of causes. (Rotenstreich, 1977, p.4–5)

The above quote from Rotenstreich, regarding Aristotle's view of manual and master workers, helps give some clues to understanding differences in terms of the act of knowing how to do something that works, as opposed to knowing why and how the things that we do work.

Knowing, however, does not necessarily equate with the explication of

such knowledge. Michael Polanyi suggests that 'we can know more than we can tell' (Polanyi 1967, p.8). The distinction between explicit and hidden knowledge, or 'tacit' knowledge can be attributed to Polanyi (1967). He also describes the distinction between 'distal' knowledge – that which can be clearly communicated and 'proximal' (tacit) knowledge – which he argues cannot be formalized.

This study so far has identified and established a gap in recorded knowledge relating to text typeface design. Given that such paucity exists, it must be considered if it is indeed at all possible to interrogate design knowledge in relation to this. What Polanyi describes as 'tacit' knowledge may help to explain why such a problem may exist in relation to text typeface design. Conversely, difficulty in explaining or giving such accounts may be assumed rather than tested.

Previous design studies have drawn upon cognitive psychology to explain why designers may think or behave in certain ways Eastman (1970), Akin (1986), Lawson (2003, 2006). Studies have also led on from questioning accepted or anticipated beliefs in relation to design process. Some of these studies have suggested that previously established theorised concepts regarding analysis and synthesis in relation to design process could not be found to be evident in the practice and behaviour of designers. In particular, when set problem-solving tasks or being interviewed. Designers behaved or responded differently than was previously anticipated. Through interviewing architects, Jane Darke (1979) discovered that amidst the complexity of problem solving relating to large projects, architects often introduced a self-imposed precedent found within the initiating design process that she termed the 'Primary Generator'. The 'Primary Generator' appeared as influencing the development of the design from an early stage. However, this was not related to the problems at hand. This is described by Darke as 'a broad initial objective or small set of objectives, self-imposed by the architect, a value judgement rather than a product of rationality' (Darke 1979, p. 36).

In describing knowledge particular to design, Nigel Cross coined the

phrase 'designerly ways of knowing' (Cross 2007). Cross argues that there is something specific to designers and the way that they think that marks them differently.

The subject of how designers may find it difficult to describe what they know, and how knowing is, or isn't imparted is also commented on by Cross:

> What designers know about their own problem-solving processes remains largely tacit knowledge – ie. they know it in the same way a skilled person 'knows' how to perform that skill. They find it difficult to externalize their knowledge. (Cross 2007, p. 25)

Bryan Lawson aligns these 'designerly ways of knowing', with the terms 'episodic' and 'semantic', as described by Tulving (1972) with respect to memory. Lawson argues that we put no conscious effort into trying to store our experiential knowledge as events from life (Lawson 2003, p. 44). He further offers that 'design knowledge is more heavily dependent on this experiential or episodic memory than the knowledge used in many other professions' (Lawson 2003, p. 45).

In *Psychology of Architectural Design,* Ömer Akin (1986) draws upon earlier studies by Anderson (1981), Sussman (1973) and Lenat (1983) to describe Declarative Knowledge as 'all that we know which describes how things are' – 'through objects, their attributes and the relations between them' and Procedural Knowledge as 'all that describes and predicts actions or a plan of action' (Akin 1986, p.32).

Parallels can be drawn between declarative and procedural knowledge as actions in relation to craft. An example of this is given by David Pye in his book *The Nature and Craft of Workmanship* (1968). Pye describes the workmanship of risk as:

> … in which the quality of the result is not predetermined, but depends on judgement, dexterity and care which the maker exercises as he works. The essential idea is that the quality of the result is continually at risk during the process of making … (Pye 1968, p.4)

This can interpreted as a statement not only regarding procedural knowledge but also one of procedural action. Pye contrasts this with the workmanship of certainty as:

> … always to be found in quantity production, and found in its pure state in full automation. In workmanship of this sort the quality of the result is exactly predetermined … (Pye 1968, p.4)

The contrast here is that the latter statement can be interpreted as being declarative, the outcome being prejudged or known, an a priori in terms of expectation.

This argument of particular action and knowing in practice is not to say that such phenomena are necessarily explicable, let alone identifiable. We may consider when engaged in the act of designing, our attention is on the thing we are designing, not on our concentration of understanding of the ability to design.

In *Knowing and Being*, Michael Polanyi talks of the 'unspecifiability of particulars' (Polanyi 1969, p.124). He describes different states of the concentration of our knowledge as affected by the act of concentration itself this in turn affecting our ability to concentrate on two states simultaneously. Of this Polanyi argues:

> Specifiability remains incomplete in two ways. First, there is always a residue of particulars left unspecified; and second, even when particulars can be identified, isolation changes their appearance to some extent. (Polanyi 1969, p.124)

He continues to expand upon this theme:

> Every time we concentrate our attention on the particulars of a comprehensive entity, our sense of its coherent existence is temporarily weakened; and every time we move towards a fuller awareness of the whole, the particulars tend to become submerged in the whole. (Polanyi 1969, p.124)

Polanyi describes this phenomena or concentration between states as

'attending to' and 'attending from' (Polanyi 1969, p.145). An example of this can be illustrated in the act of writing with a pen. A person may be initially aware of the pen as an object in their hand, its weight, feel etc. This can be described as attending 'to' the object. However, once they begin writing with the pen the concentration is not so much on the pen itself but what they are doing with the pen. This can be regarded as attending through or 'from' the concept and experience of the pen.

This description of the difficulty of simultaneous 'attendance' may partly help explain the problems in terms of accounting for type design process. Because the activity requires designers to work simultaneously at micro levels of detail and macro levels in terms of overview, this could make for complex navigational approaches of such processes. Nothing is fixed as designers are forced to 'zoom-in' and 'zoom-out' in creating complicated internalized mental maps of their location in such schemes.

2.4 Further considerations of etic and emic accounts

Regarding how we may consider etic and emic viewpoints and accounts, it is the concept of relativity in connection with the account – relative to what and whom – that may provide us with useful insights and tools for determining the value of such accounts for study. Viewpoints can be considered as perspectives from within and without. This is reflected in what William James (1950) identifies as two kinds of knowledge: 'knowledge of acquaintance' and 'knowledge about' (p. 221). He also offers what may be described as the conceptual particular – the relationship between a core 'topic' and a 'fringe of unarticulated affinities' (James 1950, p.259). This implies that if we are positioned within the fringe we may have 'acquaintance' with type design practice. However, this does not necessarily equate to having knowledge 'about' designing type.

Considering the above, and in relation to past accounts of practice, Joseph Moxon, the first English writer on type founding, can be taken to exemplify the problem of categorizing definitive or exact labels such as expert. At what point is an expert an expert? Although Moxon produced type, he was not

considered a type designer per se. Reed (1887/1952) comments on Moxon's first type specimen of 1669:

> In all respects it is a sorry performance. Only two fonts, the Great Canon and the Pica, have any pretensions to elegance or regularity. The others are so clumsily cut, so badly cast, and so wretchedly printed, as here and there to be almost indecipherable. (Reed 1887 – Johnson 1952, p. 171)

There is clear evidence that Moxon made type; however, evidence indicates that he was far from what we would consider a proficient or accomplished type designer. Even if Moxon was not a virtuoso of the craft, what he produced and attempted did require some degree of skill and ability.

2.5 Summary – Epistemological and ontological proximity

In the case of becoming a type-designer, the statement in the above section implies a contiguous nature of 'being'. Being in this sense is not fixed. It is relative to the knowledge, skill and ability of the type designer.

The relationship between epistemological evidence of subject knowledge and ontological qualities of being, in terms of those giving accounts of practice, must also be considered relative to the expectations for study.

For example, type design may be viewed as at a Jamesian domain or epicentre within the wider context of type production or typography. How close to this centre can the position of accounts be related? Where are those giving such accounts placed in relation to such a scheme, in that these may yield valuable evidence for enquiry? With regard to ontological understanding of what type design is, if type designers are what makes type design a subject of study, those with the greatest expertise or knowledge of this subject would reside safe within the centre of that subject domain. It can also be asserted that those with great knowledge and expertise would be regarded as being experts in the subject. Cross highlights the lack of research involving exceptional or outstanding designers (Cross 2003, p.85). He asserts, richer understandings of the subject can be gained by examining actions of

the expert practitioners from within a given subject. Lawson (1997) supports this view of knowing how designers think:

> It seems reasonable to suppose that our best designers are more likely to spend their time designing than writing. If this is true then it would be much more interesting to know how very good designers actually work (p.40).

Both Cross and Lawson illuminate a clear standpoint, that insight to expert knowledge with regard to practice, would yield richer and more interesting perspectives in terms of knowledge of design practices.

This study seeks to address the gap that exists in research relating to knowledge of text typeface design process, by concentrating on the perspectives given by experts in relation to their accounts and knowledge of practice. The following chapter will discuss the research design and methodological choices made in light of the prevailing knowledge gap.

3.0 Methodology

Contents

3.0 Methodology

3.1 Introduction

This chapter sets out to make clear the research methodology and related methods used within this study. From analysis of the collected data, interpretive theories are developed that explain phenomena in relation to text typeface design process as described by research participants.

This research adopts a qualitative Grounded Theory Methodology (Glaser and Strauss 1967). This is an existing, recognized general research methodology and a simultaneous method of enquiry and analysis which allows for the development of interpretive theory. Grounded Theory Methodology aligns with the aims of this study in terms of methodological 'fit' for this research.

Competing methodologies, paradigms and perspectives that were also considered in relation to this research are discussed further in this chapter.

To reiterate:
In relation to text typeface design process, this study is concerned with main research question:
Can knowledge of text typeface design process be revealed and if so can this be explicated theoretically?

The aims of this research are:

1. To reveal and describe processes of text typeface design from accounts given by type design experts.

2. To evaluate whether it is possible or not to construct theory or theories of type design process from the accounts of practice and procedure given by type design experts.

3. To offer possible, descriptive and/or generative theory/theories that will allow further study to develop in the area of text typeface design process as well as informing practice.

It was evident in order to objectively fulfil the needs of the first research aim, a qualitative research approach would be necessitated (see section 3.2.2). In this research, the emphasis is on the accounts provided by text typeface design experts via interviews as a primary data source. This research is concerned with developing theory from what experts impart in terms of knowledge of processes – qualities that emerge from the collected data. This research is concerned with understanding 'what' it is that experts say and 'why' it is important. A qualitative research approach aligns with research aims 1 to 3.

The author's experience as a design practitioner and educator afforded him a certain degree of insight and sensitivity toward the nature of the emergent research issues (section 3.3.7). Although some general accounts of method and practice exist with respect to text typeface design, as have been discussed (Literature Review 2.2.2), a comparative study and analysis of accounts given by text typeface design experts has not been conducted. It was therefore necessary to adopt an open approach, one that allowed for the inductive-emergent collection (section 3.2.3) and comparative analysis of data (sections 3.6 to 3.6.2), also an approach that would facilitate the development of theory. The adoption of a Grounded Theory Methodology aligns with this and with research aims 2 and 3.

3.1.1 Research design overview

Studies have been established in other design domains with regard to design process, for example: architecture (eg. Akin 1986, Darke 1979, Eastman 1970, Lawson 1979); engineering design (eg. Bucciarelli 1994, Marples 1960); industrial/product design (eg. Cross, Christiaans and Dorst, 1996); urban design (eg. Levin 1966). However, this research is concerned with contemporary processes of text typeface design. It could not be taken for granted that knowledge of design processes in other areas and the methods

by which they have been studied, would apply directly to text typeface design. Therefore, comparative studies between knowledge of text typeface design process and knowledge of design processes in other fields was ruled out early. In terms of research design for this study it was therefore necessary to adopt a qualitative/emergent approach as the research concerns of this study are focused on accounts of expert knowledge of text typeface design, not the observation of designing itself per se. This study investigates expert knowledge through interviewing experts with respect to the knowledge of practice as opposed to making observational studies of design practice. The importance of conducting research where experts are able to discuss their experiences, knowledge and memories in relation to their specialist activities, that consider long-term, experiential or 'episodic' (Tulving 1983) memory has also been intimated by Bryan Lawson: '… to listen to conversations and explore long-term episodic memories' (Lawson 2003, p.49). This research is therefore concerned with what it is that experts in the area are able to impart and the qualities of what they impart in relation to one another.

This research adopts a Grounded Theory Methodology. According to Christina Goulding, Grounded Theory Methodology is:

> Essentially, the methodology is most commonly used to generate theory where little is already known, or to provide a fresh slant on existing knowledge. (Goulding 2002, p.42)

Grounded Theory Methodology allows for a substantive theory to be developed inductively from the data itself (Glaser and Strauss 1967). Glaser describes this as:

> The GT product is simple. It is not a factual description. It is a set of hypotheses, set of concepts which are organised around a core category. This generated theory explains what the preponderance of behavior is in a substantive area. (Glaser 2003, p.14)

This is in contrast to 'theory generated by logical deduction from a priori assumptions' (Patton 2002, p.125). The statements above align with the adoption of Grounded Theory Methodology as satisfying the requirements of the research aims of this enquiry. Grounded Theory Methodology allows

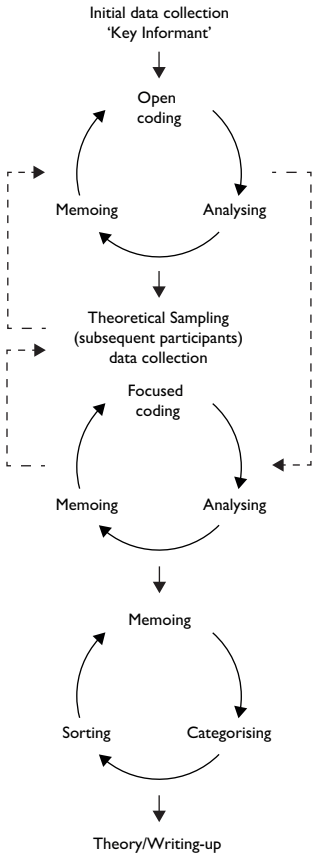


Figure 3.1.1
Diagram showing the overview of the research design adopted for this study. NB. cyclical steps not linear development from coding to theory generation.

for an open, emergent approach to the research enquiry as opposed to making assumptions in relation to initial unfounded hypotheses as starting points for research.

Grounded Theory Methodology involves the collection and coding of data via theoretical sampling, analysis by means of constant comparison and raising concepts that become theory through memoing. This leads to developing theoretical categories, sorting of categories and the writing up of research (these terms are discussed further within the chapter below). Figure 3.1.1 shows a simplified model of the research design for this study. The process of Grounded Theory Methodology is a nonlinear one of cyclical steps, as Glaser describes:

> The detailed, conceptual grounded route from data collection to a finished writing is a process composed of double-back steps. As one moves forward, one constantly goes back to previous steps.
> (Glaser 1978, p.16)

Considerations and decisions as to the choice and application of the research methodology are discussed in full within this chapter.

3.1.2 The considerations of this chapter

Within this chapter, section 3.2 and its related subsections 3.2.1–4 discuss considerations of a general and broad nature that frame and position the research. Section 3.3 and its subsections discuss considerations and orientation of research method in terms of specific perspective and 'fit' relative to the enquiry. Sections 3.4–3.7 discuss, evidence and articulate methods utilized and how they relate directly with the research enquiry. Section 3.7.2 articulates an additional original method of 'Empathic Memoing' devised by the author – also a contribution to knowledge. Section 3.8 summarises the selected methodology alongside considerations and implications.

3.2 General considerations in relation to the research

3.2.1 Basic research

This research can be broadly described as 'basic research'. Michael Quinn Patton describes the purpose of basic research as 'knowledge for the sake of knowledge' (Patton 2002, p.215). He offers a rationale of why researchers conduct basic research:

> Researchers engaged in basic research want to understand how the world operates. They are interested in investigating a phenomenon to get to the nature of reality with regard to that phenomenon. The basic researcher's purpose is to understand and explain. (Patton 2002, p.215)

The purpose of basic research is also described within the Sage Encyclopedia of Qualitative Research Methods as:

> …basic research that is undertaken for its own sake is often the foundation upon which future knowledge – and future applied research – rests… (Given 2008, p.57)

By way of operational, descriptive or explanatory theory/theories (see chapter 4.0, 4.1, 4.2, 4.3 and 5.0) it is anticipated that the knowledge generated in this study may be applied by others, either a basis for further research or applied in the practice of designing and teaching of text typeface design. Although this research can be described as 'basic' research, this term is used to indicate that the research is concerned with the generation of knowledge rather than validation and testing, the latter being found in applied research.

Basic research has also been described by Buchanan in relation to design research as:

> It is research directed towards fundamental problems in understanding the principles – and sometimes the first principles – which govern and explain phenomena. (Buchanan 2001, p.18–19)

This research seeks to establish first principles in relation to what can be described or theorized in terms of text typeface design process. One of the

aims of this research is that it will allow others to develop further research afforded by what this study reveals.

3.2.2 Qualitative research

Qualitative research is described as 'designed to explore the human elements of a given topic, where specific methods are used to examine how individuals see and experience the world.' (Given 2008, p.xxix)

Findings of qualitative research generally emerge from three main types of data collection, these include in-depth open-ended interviews, observations and documents (Patton 2002, p.4). The latter of these points can include written and/or visual image content.

Qualitative research is often seen in contrast to quantitative research in that it is concerned with phenomena in terms of 'qualities' in relation to the data rather than expressing data in numerical terms. Qualitative research can yield rich descriptions of complex data. The concern of qualitative enquiry is not necessarily to find fixed answers to problems but to offer explanations that 'fit' with the nature of the enquiry itself.

This research follows a qualitative approach as it is concerned with 'what' design experts say in relation to their knowledge of text typeface design process via in-depth interviews.

3.2.3 Emergent research

Based upon the identified knowledge gap (2.0 Literature Review), it was apparent that a credible hypothesis would be difficult to construct or apply from the outset of this research. It was clear in terms of initial research questions, what was emerging was a group of 'sensitizing concepts' , Lisa Given describes this:

> Even the most flexible qualitative study begins with some ideas about what to observe, where to find sources for those data, and how to collect the relevant information. The prior ideas and beliefs that researchers bring to the field are sometimes known as 'sensitizing concepts.'

> Hence, no research design can be fully or completely emergent; instead, emergent design allows for an ongoing reassessment of how to conduct the research based on what has been learned from prior data collection and analysis. (Given 2008 p.246)

Initial sensitizing concepts pointed toward research that would necessarily need to be focused on collecting empirical data of a qualitative nature. Aspects such as sample and sampling could not be predetermined until data began to appear, as there was no clear basis upon which to establish hypotheses to form a purposive sample. Here the sensitized concept regarding the group to study would be those with a greater degree of knowledge about the subject of text typeface design. A study of novices for example, may not give accurate or adequate data on anything other than how novices design. Nigel Cross draws attention to potential problems in understanding design through studying novices:

> Most studies of designer behaviour have been based on novices (eg. students) or, at best, designers of relatively modest talents. The reason for this is obvious – it is easier to obtain such people as subjects for study. However, if studies of designer behaviour are limited to studies of rather inexpert designers, then it is obvious that our understanding of expertise in design will also be limited. (Cross 2008, p.85)

This study began with an emergent focus including sensitized aspects in relation to the identified knowledge gap.

3.2.4 Interpretive – Abductive research

As is the case with all qualitative enquiry this research is a form of interpretive research that seeks to make sense or meaning from data collected empirically. Qualitative, interpretive research forces engagement with others in an effort to see the world from their point of view: 'Interpretive qualitative methods mean entering research participants' worlds.' (Charmaz 2006, p.19). This also requires making sense of what is found and invokes responses through various forms of conceptual reasoning in order that the research can progress. With respect to this Charmaz offers:

> The particular form of reasoning invoked in grounded theory makes it an abductive method, because grounded theory includes reasoning about experience for making theoretical conjectures and then checking them through further experience. (Charmaz 2006, p.103)

3.3 Specific considerations in relation to the research methodology

3.3.1 Rationale for a Grounded Theory approach

Methodological approaches that rely upon an initial hypothesis or substantive theory were less likely to have a good fit in relation to the current study, as there was little to base such postulates upon. The nature of what this study seeks to address could be argued to be of a close methodological fit with respect to several competing perspectives and methodologies. Similar but alternative perspectives include Naturalistic Enquiry and studies with an Ethnomethodological – everyday life, Phenomenological – lived experience and Hermeneutical – interpretative nature (Patton 2002). Indeed, the nature of this enquiry could be described as adopting a 'blend' of these perspectives. However, these research methodologies or perspectives can also require an identified initial substantive theory or theoretical framework to be established as focus toward the conduct of the study.

The choice of Grounded Theory Methodology therefore, facilitates the ability to connect induction and deduction through a series of stages of coding data and analysing as themes and concepts emerge. This culminates in a methodology that is eventually abductive in nature (Charmaz 2006, p.103) as researchers discover, create and construct theoretical meanings and explanations from the data.

In relation to studying design process, caution was observed in hypothesizing or relying on a priori postulates before data was collected and analysed, particularly from a subject discipline where there is an obvious lack of historically developed research material. Although there may be some glimpses and insights as to methods of typeface design practice in the accounts mentioned within the Literature Review (chapter 2.0), such

glimpses do not substantively inform thinking toward robust understanding of processes and how these are articulated.

The following sections 3.3.2–5 consider possible competing research paradigms and methodologies that in some respects align with the aims of this research. 3.3.6–7 highlight considerations particular to the author as researcher along with considerations of insider and outsider perspectives in approaching this research enquiry. Section 3.3.8 concentrates on the argument of methodological 'fit' in terms of Grounded Theory Methodology.

3.3.2 Naturalistic enquiry

Consideration was given to whether the method for this study would fit within a Naturalistic Enquiry framework given the qualitative, emergent nature of the research. Whereas Grounded Theory Methodology can be seen as a form of Naturalistic Enquiry due to the nature of a 'discovery-oriented' approach (Patton 2002 p.39; Glaser & Strauss 1967), the emphasis in the latter is of discovery taking place within 'participants' natural environments' (Given 2008, p.548). At the outset of this study it could not be determined what such 'natural environments' entailed for designers today. With regard to Naturalistic Enquiry, Given suggests that 'Researchers must meet participants where they are, in the field, so that data collection occurs while people are engaging in their everyday practices (Given 2008, p.548). However, this research is concerned with knowledge in relation to process, not in the observation of process itself. Naturalistic Enquiry also requires 'purposive sampling'. Purposive sampling is described by Given as: 'Selecting a site or multiple sites for investigation should involve purposive or deliberate sampling to ensure that participants have direct experience with the issues or topics under examination (Given 2008, p.548). In this study, beyond identifying the sensitized concept of expert knowledge relating to text typeface design process, no further purposeful or deliberate sampling could be determined at the outset. This aspect in part led to the adoption of Grounded Theory Methodology, as this would allow for Theoretical Sampling (sampling in relation and response to the developing theory) as opposed to prior purposeful sampling common in Naturalistic Enquiry. Although this research does have some relation to Naturalistic Enquiry,

the conditions above negated the consideration of this as the selected methodology.

3.3.3 Ethnomethodology

Harold Garfinkel developed Ethnomethodology (1967) as an 'alternate' sociology that focuses on 'the ordinary, the routine, the details of everyday life.' (Patton 2002, p.110). Aspects of Ethnomethodology as a research methodology align with some of the areas of interest for this study, in particular the routine actions of people:

> Ethnomethodology gets at the norms, understandings, and assumptions that are taken for granted by people in a setting because they are so deeply understood that people don't even think about why they do what they do. (Patton 2002, p.111)

However, Ethnomethodologists may undertake 'ethnomethodological experiments' or 'violate the scene' (Patton 2002, p.111) to gauge the actions and reactions of subjects. Lisa Given suggests preference in terms of methods in such research design:

> The core data for ethnomethodological studies tend to be observations, either directly as ethnographic observations or indirectly by studying audio or video-recordings. A major difference with most other qualitative researchers is that ethnomethodologists tend to avoid using interviews as their major data. (Given 2008, p.294)

As outlined in the research aims, this research is concerned with knowledge of experts in relation to text typeface design process, such knowledge needed to be obtained in a manner that tested and evidenced if articulacy of process was indeed possible or whether such knowledge would remain 'tacit' (Polanyi 1973). One of the main methods this research would draw upon, was in-depth, open-ended interviews, in order to obtain research data. It is essentially for this reason that Ethnomethodology alone could not be considered as a main methodological framework for this research.

3.3.4 Phenomenology/Phenomenography

Phenomenological and phenomenographic approaches share common goals, exploring how human beings make sense of experience and how this relates to consciousness (Patton 2002 p.104). Phenomenology is described as:

> …the reflective study of prereflective or lived experience. To say it somewhat differently, a main characteristic of the phenomenological tradition is that it is the study of the life world as we immediately experience it, prereflectively, rather than as we conceptualize, theorize, categorize, or reflect on it. (Given 2008, p.614)

She also comments that phenomenography is described as 'a research approach aimed at the study of variation of human experiences of phenomena in the world.' (Given 2008, p.611)

The essence of these perspectives is related to the lived experience. Phenomenography pays particular attention to 'variation and experience':

> The study of variation implies an interest in capturing various dimensions or facets of a phenomenon as it appears to a number of people. A way of experiencing something… (Given 2008, p.611)

There are aspects of these perspectives that align in some way with the aims of this research with respect to accounting for perceived understanding of the world. However, the interests of this research are not related to the perceived experience of designing type. That is to say this study is concerned with articulating understanding of process, not articulation of understanding of what it is to experience being a text typeface designer. This study does not focus on questions such as: can we describe what it feels like to be an expert designer of typefaces? Therefore, the lived world experience perspective, in terms of a sole methodological framework for enquiry, does not align specifically enough with the aims of this research to be considered as an appropriate research methodology.

3.3.5 Hermeneutics

Hermeneutics is the study of the theory and practice of understanding

through interpretation. Hermeneutics' long and traditional theoretical underpinnings can be traced back to Kant (1724–1804) in terms of his determination that no view of the world of knowledge can be accessed without interpretation or theory, and that the mind makes sense of the world based upon prior conceptual views of the world (Given 2008, p.386). The original focus of Hermeneutics was based in the study and interpretation of religious texts. It was Schleiermacher's (1768–1834) identification of two forms of interpretation however, that paved the way for Hermeneutics to develop as discourse:

> …acts of interpretation that happen all the time as people encounter texts or the world around them and on which they act without much thought and those that deal with ambiguous, complex texts or situations where understanding is not immediately available or clear… (Given 2008, p.386)

Regarding Hermeneutics in relation to qualitative enquiry, Patton suggests:

> Hermeneutics is yet a different theoretical approach that can inform qualitative enquiry … it reminds [us] that what something means depends on the cultural context in which it was originally created as well as the cultural context within which it is subsequently interpreted. (Patton 2002, p.113)

A form of Hermeneutics will necessarily be employed within this research in terms of making meaning and understandings from collected empirical data, so that theory can be developed that explains and describes knowledge of process in relation to text typeface design. Where knowledge resides in relation to this study is with individuals themselves. As part of the aims of this research the author seeks to provide explication in terms of text typeface design process. A hermeneutical dimension will be evident in the analysis of the data and in the theory generation for this research. However, a purely hermeneutical approach will not suffice as a robust methodology for this research based upon the identified knowledge gap.

3.3.6 Emic/Etic perspectives and considerations

The author's relationship in terms of emic and etic perspectives (Pike 1967) toward the field of study in this research are influenced by his background and experience. This is considered in conjunction with the research methods utilised in this research.

As discussed within the previous chapter (2.0 Literature Review), emic viewpoints can be seen to be insider views, internal to the nature of the field of enquiry and aligned with how people who inhabit the field hold particular views of the world around them (Given 2008, p.249). In terms of qualitative research an emic view is grounded in an emergent phenomenological view of the world rather than having a predetermined set of a priori assumptions about what people think and do. Etic perspectives are external to the world-view of the field of enquiry. This can be explained as: 'The etic view involves stepping back from the insider's views in an attempt to explain how groups are communicating or miscommunicating.' (Given 2008, p.249).

Through the use of a Grounded Theory Methodology, the emergent nature of such study leads the investigator to work with collected empirical data establishing an emic viewpoint, inside the field of enquiry, to eventually produce explanatory theory that accounts for what is happening within the field but from an outsider, etic viewpoint.

The author includes a description of his background knowledge and experience that he brings to this research below.

3.3.7 Investigator's background and experience

The author's professional background, experience and current professional activity are based in design and design education. His professional career as a designer spans twenty years at the time of writing this thesis. His areas of specialism are graphic design and typography. His interest in type design began whilst undertaking a Master of Arts where his major project focused on the use of the Bezier tool in informing the shaping of type forms. Since then he has had an active interest in type design. His current role as an

educator within a higher education setting, often involves teaching students who develop typeface designs, particularly students at Masters level. He also continues to develop his own typeface and lettering designs, many of which find application within professional design commissions that he undertakes alongside teaching and research. It is the author's view that his background and current practice interests – whilst not wholly based in type design but having a heightened awareness of the specialism in relation to graphic design and typography – have afforded him an ability to view this research project from both emic and etic viewpoints. This in turn has enabled him to develop questions in relation to the emergent research and hold conversations with participants at multivariate levels of complexity and understanding relative to the area of this research enquiry.

3.3.8 Methodological 'fit' in terms of Grounded Theory Methodology

This study seeks to address – is possible or not to construct theory or theories of type design process from the accounts of practice and procedure given by type design experts? The nature of such a question requires a response that will allow inductive enquiry to develop.

This study set out without making positive or negative a priori assumptions or framing the research with a formulated, developed substantive theory. Theory emerges from '…systematic comparative analysis and is grounded in fieldwork so as to explain…' (Patton 2002, p.133).

The choice of using a Grounded Theory approach is consistent with the view of Goulding: 'Usually researchers adopt grounded theory when the topic of interest has been relatively ignored in the literature or has been given only superficial attention.' (Goulding 2002, p.55). It can be argued, that a Grounded Theory approach is apposite to the nature of this enquiry.

3.3.9 Grounded Theory perspectives

There is not enough room within the body of this thesis to lay out a separate argument for the history and development of Grounded Theory

Methodology without causing interruption to this chapter. Subsequent views and perspectives have led to subtle remodelling of aspects of the methodology at times. Therefore, some of the key points and arguments are included in appendix 1 as demonstration of the author's awareness of such developments and debates with respect to the methodology.

3.4 Data collection

The main data collection method employed in this research is in-depth 'open-ended' interviews. An initial pilot interview was conducted in order to establish and generate themes and data for possible inclusion in the research. Further interviews could then be orientated from this initial enquiry. Interviews are semi-structured, unstructured and conversational in nature as appropriate to allow themes to emerge and develop. This is consistent with the emergent nature of the method of a general grounded theory approach. Interviews are at times, guided by a developed loose interview schedule that allow for probes and transitions (Patton, 2002, p.344) to develop themes within the conversations. However, the flexibility in interview styles also allows for building rapport with the contributors as well as maintaining the trust and confidence of the participants. David Silverman (2006) refers to this with respect to Fontana and Frey (2000) as aiming to develop 'understanding the language and culture of the respondents' (Sliverman 2006, p.110) and toward achieving this the interviewer resolves the problems of – deciding how to present yourself, gaining and maintaining trust and establishing rapport with respondents (Fontana and Frey 2000, p.655).

3.4.1 Sampling

The sampling strategy adopted for this study follows the method of emergent 'theoretical sampling' outlined by Glaser (1978), being linked with grounded theory as:

> …the process of data collection for generating theory whereby the analyst jointly collects, codes and analyses the data and decides what data to collect next and where to find it, in order to develop the theory as it emerges. This process of data collection is 'controlled' by the emerging theory. (Glaser 1978, p.36)

Decisions had to be made initially in order to establish how informants as potential providers of data, would be appropriately sampled. An initial survey of type designers revealed a large number of possible potential informants within the field of current practice at the time. These ranged from high profile, recognized established industry experts, emerging independent type designers through to those associated with large commercial type foundries. However, it was decided that making a selection of informants prior to the study would not fit with the emergent nature of the research itself. Initial potential Key Informants (Given 2008, p.477) (section 3.4.2), were identified and approached in order to build relationships and give direction to the emergent research. The initial approach of theoretical sampling associated with grounded theory approach allows sampling to emerge relative to the data. This is opposed to making forced assumptions of why samples are relevant prior to commencement of the research:

> With grounded theory, groups [samples, individuals etc.] are chosen when they are needed rather than before the research. Initially, the researcher will go to the most obvious places and the most likely informants in search of information. However, as concepts are identified and the theory starts to develop, further individuals, situations and places may need to be incorporated in order to strengthen the findings. (Goulding 2002, p.66)

Samples identified as potential key informants initially can be seen as: 'Information-Rich Cases … cases from which one can learn a great deal about matters of importance and therefore worthy of in-depth study' (Patton 2002, p.242).

This research began with a pilot interview with an identified Key Informant as a means to begin the research process. This in turn led to the beginning of 'Theoretical Sampling' (Glaser and Strauss 1967) which forms part of the Grounded Theory Methodology.

3.4.2 Sample

As stated above, the sample for this study began with an initial key informant (Given 2008, p.477) so that data could be gathered, this allowed for initial open coding and memoing to develop. Once themes began to appear in the data, the Theoretical Sampling orthodoxy of Grounded Theory Methodology was utilised (Glaser 1978, p.36). The sample of participants that appear in this study were interviewed over a period of four years (see section 3.4.5).

Some potential participants that were identified for interview either declined the offer to take part in the study or obviously were uncomfortable with the idea of being interviewed regarding their approaches to design process. Care had to be taken in these circumstances to respect the wishes of those approached. In some instances there was a need to moot the possibility of an interview well before this would be conducted so as not to appear forceful with regard to seeking information. Once it had been determined through the analysis of data in relation to themes and questions that were emerging, potential participants were identified and approached.

The sample for this research consisted of high profile text typeface design experts. The stipulation of using experts within this study was in order to gain insight to their 'world view' of text typeface processes. The use of experts in this sense is advocated by Cross in developing a greater understanding of design knowledge generally (Cross 2007, p.85).

Gaining access to such expertise for this research was at times difficult. Patience and perseverance were required over long periods of time with respect to building rapport and confidence with potential participants, in pursuit of arranging and conducting interviews.

3.4.3 Ethical approval

Ethical approval for this research was sought and obtained through the University of the Arts London formal ethics committee in line with university policy. Documentation produced to inform and enlist participants

(see appendix 2.0) was submitted and approved before any research of an empirical nature was conducted. Participants were made clear of the nature of the study and also the way in which data would be used, processed and archived. No participant declared a wish or need to remain anonymous with respect to this study. The full names of the participants do not appear within examples of the processed data representation but initials of participants names appear with regard to data files and extracts.

3.4.4 Interview schedule/guide

Before interviews were conducted an interview schedule was produced to outline broad themes to be covered (see appendix 3.0). This is a standard approach (Patton 2002, p.342). The guide was used initially in order to help develop interview conversations or could be referred to if it was felt that there may be themes and issues not discussed or explored sufficiently. The interview guide became less important as themes emerged from interviews over time. These moved toward informal, semi-structured and unstructured conversational interviews, made possible due to the emergent nature of the research. Themes developing from the constant comparison of collected data, coding, analysis and memoing aided further theoretical sampling throughout the study. The move away from the use of the interview guide once themes began to emerge aligned with more open and emergent conversational approaches. This is in keeping with the constant comparative nature of Grounded Theory Methodology (Glaser & Strauss 1967, p.102). Questions could be made more directly in terms of what emerged from the conversations and in relation to what appeared in the data and coding of prior data. This required a balance of sensitivity to emergence and systematic enquiry to develop throughout data collection stages, whilst continuing analysis and developing theory simultaneously. Glaser refers to sensitivity and emergence in relation to research:

> …the full continuum of both the processes of generating theory and of social research – are all guided and integrated by the emerging theory. (Glaser 1978, p.2)

The initial interview schedule or guide therefore gave way in this study

to allow for the developing nature of emergence, central to the research method itself.

3.4.5 Interviews

Interviews were conducted face-to-face with the research participants (see table 3.4.5). Initial engagement with the type design community aided in identifying a potential participant for a preliminary pilot interview. This subsequently became part of the data included within the research due to its successful nature in obtaining rich data (Silverman 2006, p.110). Between initial informal conversations with designers and undertaking initial data collection, the author noted the nuanced differences in conversations between face-to-face interaction and conversations conducted via telephone or email. Whereas rapport with interlocutors was still possible to maintain via email and telephone, this was somewhat different to face-to-face interaction. Details such as body language, gesture and hand movements along with the ability to judge when to move the conversations on based upon participant response, proved to yield richer interlocution in terms of discussion of type design process. Patton comments that:

> Entry in to the field for evaluation research involves two separate parts: (1) negotiation with gatekeepers, whoever they may be, about the nature of the fieldwork to be done and (2) actual physical entry into the field setting to begin to collect data. These two parts are closely related. (Patton 2002, p.310)

He goes on to comment 'Where the field researcher expects cooperation, gaining entry may be largely a matter of establishing trust and rapport' (Patton 2002, p.310).

Rapport was not only an essential element and skill applied in enlisting participants to take part in the research study, it was also essential in that it was maintained throughout the study.

Twelve in-depth interviews with nine participants totalling approximately fifteen hours of recorded, transcribed, coded and analysed data from which

theory is developed is included in this study. Interviews took place over the period beginning November 2009 with the first interview and ending in June 2013 when the last interview was conducted. Interviews were conducted in the UK, Ireland and USA. Table 3.4.5 details participants, locations, settings and dates that interviews were conducted.

Table 3.4.5
Table showing the list of conducted interviews including details of participants, geographical locations, settings and dates interviews were conducted.

Table 3.4.5 – Conducted interviews

Participant	Location	Setting	Date
Gerry Leonidas	Reading UK	University	13.11.09
Gerard Unger	Reading UK	University	13.11.09
Gerard Unger	Reading UK	University	03.12.09
Jeremy Tankard	Cambridge UK	Home/Studio	05.03.10
Erik Spiekermann	Dublin IE	Conference	10.09.10
Jean François Porchez	Dublin IE	Conference	12.09.10
Martin Majoor	Dublin IE	Conference	12.09.10
Jeremy Tankard	Cambridge UK	Home/Studio	18.03.11
Matthew Carter	Cambridge Mass USA	Home/Studio	16.11.12
Robin Nicholas	Salfords UK	Work	22.03.13
Christian Schwartz	London UK	Public space	26.06.13
Erik Spiekermann	Brighton UK	Conference	28.06.13

It is believed that the participants included in this research and the data recorded in the form of conversational interviews provide a rich and unique contribution to this study.

3.4.6 Recording data

Interviews were recorded in high definition digital video. Field notes were also made during interviews to aid with gathering and understanding data as the these progressed (see appendix 4.0 for example notes).

Firstly, the use of video recording was to allow for other potential data that may be pertinent to the emergent research to be observed and analysed in connection to the conversations. This included aspects such as participants' gestures, documents and designs they used to support their conversations. Secondly, the use of a relatively unobtrusive video recording device allowed participants to feel more at ease and less conscious of obvious or imposing technology during interviews. Where appropriate and where access was granted, photography was used to record pertinent documents (sketches,

working drawings etc.) in so far that these may have been necessary to refer to in aiding further clarity in understanding recorded conversations. The flexibility and adaptability of the grounded theory method with respect to sources is highlighted by Goulding (2002) who offers that 'grounded theory research may be based on single or multiple sources of data. These might include secondary data, life histories, interviews, introspection, observations and memos.' (p.56). Both field notes and reflective notes were also kept throughout the process of data collection.

3.5 Processing data

3.5.1 Transcription

All interviews were transcribed in full by the author in order to develop a greater awareness, understanding and sensitivity towards the data. Patton comments on the usefulness of researchers producing their own transcriptions:

> Doing some or all of your own transcriptions (instead of having them done by a transcriber), for example, provides an opportunity to get immersed in the data, and experience that usually generates emergent insights. (Patton 2002, p.441)

Transcriptions of the interviews from this study were made in conjunction with viewing playbacks of the recorded digital video files and not from audio tracks alone. This facilitated a greater understanding and sensitivity as to what was being said within the interviews. Within the interviews participants would often use hand gestures or refer to artefacts to give clarity or to express meaning in relation to verbal accounts of phenomena (see appendix 5.0 and 5.1 for examples). Transcribing from the videos allowed for the inclusion of supplementary notes and comments to be made in order to give further clarity to transcription of the verbal data collected. Field notes made at the time of the interviews were also referred to during transcription to ensure that details and representation of the data could be made as clear as possible.

Transcribed recorded interviews and associated media files were then transferred to be used within qualitative analysis software. This allowed for greater accuracy in terms of defining line numbering for the transcribed text and also to aid in the development of analysis in terms of allowing data to become searchable and categorized through analysis and theory generation stages of the research.

3.5.2 Hardware and software used in processing data

The qualitative data analysis software, TAMS (Text Analysis Markup System) Analyzer, was selected to allow for consistent workflow within the Macintosh computer environment. This software offered powerful relational database architecture with the ability to develop codes and categories in connection to collected and transcribed data (see Appendix 6.0 for a further description of this software). This supported the Grounded Theory Methodology process.

3.6 Analysis of data

Analysis started early in the process of the study in the form of coding and notes in relation to the data, this helped to direct and orient the enquiry as themes emerged. Interviews were transcribed and analysed line-by-line. At this point coding techniques are employed of which there are ultimately three to four levels in terms of revisiting and refinement. These led initially to further reanalysis and then to the building of categories that form concepts. The rationale for using structured coding is that this allows for moving from a descriptive analysis toward concept building and theory building levels. The process is an inductive constant comparative process. Initial coding or 'open-coding' is applied to the transcription with the view to identifying every possible meaning that relates to the theme of enquiry. These initial codes or labels are then scrutinized in order to establish categories of themes or concepts that are emergent. As themes develop and are further abstracted this then leads to a stage of coding where concepts are further defined, this stage is often referred to as secondary 'focused coding'. The importance of this move from the descriptive to the more abstracted

is highlighted by Goulding (2002) 'it is important to move beyond open coding, which basically describes what is happening in the data, to a more sophisticated conceptual form of analysis.' (p.77–8). It is from the analysis of the secondary 'focused coding', categories and concepts that core categories and theories may be constructed. Glaser (1978) describes a core category as a main theme that sums up a pattern of behaviour.

3.6.1 Coding

Coding in relation to Grounded Theory Methodology performs a particular function, serves particular purposes and is produced in particular ways relevant to grounded theory itself:

> Unlike quantitative data which applies preconceived categories or codes to the data, a grounded theorist creates qualitative codes by defining what he or she sees in the data. Thus, the codes are emergent–they develop as the researcher studies his or her data. The coding process may take the researcher to unforeseen areas and research questions. Grounded Theory proponents follow such leads; they do not pursue previously designed research problems that lead to dead-ends. (Bryant & Charmaz et.al. 2007, p.605)

Coding was used in this study in order to tag and reference 'incidents' within the data. Incidents are continually compared and may form the properties of a 'category' that in turn may generate a code or modify an existing code where properties of incidents are subsumed within the code. Key concepts emerging from the collected data and the codes represent a 'concept', which in turns leads to the development of theory. Initial codes and the concepts that they represent were later grouped and again related in terms of categories and properties as the study progressed. This allowed new codes to emerge whilst earlier codes were either modified or found saturation in terms of comparison across data in relation to categories. From the categorization of codes theory was developed through the process of memoing. Glaser describes this process:

> The code conceptualizes the underlying pattern of a set of empirical indicators within the data. Thus, in generating a theory by developing

> the hypothetical relationships between conceptual codes (categories and their propert[i]es) which have been generated from the data as indicators. (Glaser 1978, p.55)

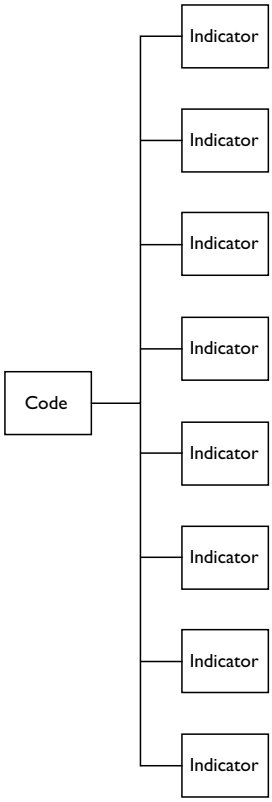


Figure 3.6.1.1
Diagram illustrates the relationship of indicators or 'incidents' at the data level to a developed code (adapted from Glaser 1978).

Figure 3.6.1.1 shows the relationship between 'indicators' at the empirical data level and the coded level at which interpretative conceptualisation begins within Grounded Theory Methodology.

Coding began within the research along with memoing (see 3.7.1). Initially coding began as notes, thoughts and reflections. These were written as marginal notes alongside the early transcribed text (see appendix 7.0). After initial reading through and annotation of texts, open coding proper began by rereading transcripts in conjunction with playback of interview videos. Coding in relation to Grounded Theory Methodology requires attaching meaningful and useful labels to the collected data – in the case of this study, transcriptions produced from collected video data of interviews. Charmaz describes the procedure of coding in relation to Grounded Theory studies:

> As grounded theorists, we study our early data and begin to separate, sort, and synthesize these data through qualitative coding. Coding means that we attach labels to segments of data that depict what each segment is about. (Charmaz 2006, p.3).

Initial codes generated, were used to develop a sense of conceptual shorthand that described and explained what was occurring within the transcribed interviews. Developing codes from the interviews, whilst working through a line-to-line basis and attaching these to the transcriptions, helped create a systematic approach to the constant comparison of the data.

Coding continued to develop and emerge throughout the research as data was collected and analysed. The constant comparison of data, coding and generation of concepts through memoing enabled theory to develop that explains what is happening within the data but is grounded by the data. Glaser explains the role of coding in relation to this aspect of Grounded Theory Method:

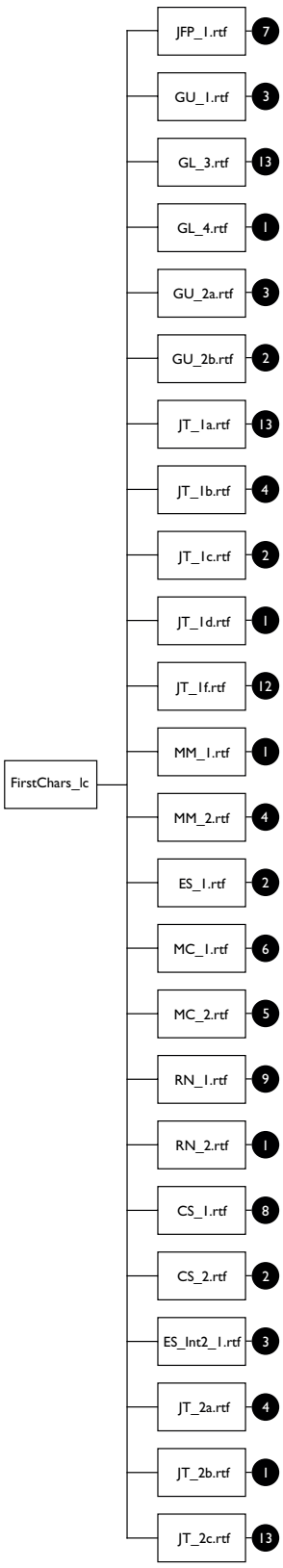


Diagram 3.6.1.2
Focused code FirstChar_lc relative to the data files to which it is linked. Numbers that appear on the right are the number of times the code is attached to incidents within the data in each file.

> Coding gets the analyst off the empirical level by fracturing the data, then conceptually grouping it into codes that then become the theory which explains what is happening in the data.
> (Glaser 1978, p.55)

Coding for this study consisted of two kinds. Firstly, initial coding or 'open coding' (Glaser 1978, p.56, Charmaz 2006, p.47, Strauss and Corbin 1977, p.133) allowed categories to be developed from the data yet remain parsimonious, or close, to the data in terms of description. Secondly, 'focused' (Charmaz 2006, p.57) coding allowed codes to be raised to a more selective and conceptual level. This included modifying and at times synthesizing concepts raised from the data. Diagram 3.6.1.2 shows an example of a focused code from this study 'FirstChars_lc'. This is shown relative to the respective data sources – the named transcribed interview files – and the numbers of incidents within the transcribed files where the code is attached. Charmaz describes focused coding as:

> Focused coding means using the most significant and/or frequent earlier codes to sift through large amounts of data. Focused coding requires decisions about which initial codes make the most analytical sense to categorize your data incisively and completely.
> (Charmaz 2006, p.57)

The move from initial coding to focused coding in terms of Grounded Theory Methodology is not a linear process, this too is emergent and in continuum as the research progresses. Given explains this: 'The move from open coding to a more focused coding is not a clearly defined step … one should not think of the process of coding as linear.' (Given 2008, p.87)

Fifty-three codes were developed in total from the analysis in this study (see appendix 8.0). These support and facilitate the theory that developed from the analysis.

Coding stopped in the analysis when saturation of categories in relation to concepts had been reached. This meant that no new properties of incidents were being discovered relative to categories and concepts.

3.6.2 Constant comparison

Central to analysis within this research and to Grounded Theory Methodology generally, is the method of constant comparison. Constant comparison along with memoing and coding are the tools in developing analysis and theory within the research. The Constant Comparative Method has four stages: '(1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (4) writing the theory' (Glaser & Strauss 1967, p.105). Constant comparative method in this research is used to compare data with data, data to category, category to category and category to concept. Constant comparison, as the name suggests, is applied throughout the research enquiry at every stage, including the writing up stages of the theory as it develops and in its final presented form.

3.7 Development of theory from data analysis

3.7.1 Memoing

Memoing is used in this research as a simultaneous methodological tool to provide opportunity for reflection and reflexivity. Memoing aids developing understanding and conceptual abstraction toward the collected data. This is described by Given:

> Memoing is the act of recording reflective notes about what the researcher (field worker, data coder, and/or analyst) is learning from the data. Memos accumulate as written ideas or records about concepts and their relationships. They are notes by the researcher to herself or himself about some hypothesis regarding a category or property and especially relationships between categories. These memos add to the credibility and trustworthiness of qualitative research and provide a record of the meanings derived from the data. (Given 2008, p.505)

In this research memoing was used to record ideas, concepts and thinking towards the data and coding. This was essential in developing, conceptualizing and abstracting thinking from describing what was happening within the data at a basic descriptive level. Memoing also

allowed for raising themes to a theoretical level. 'Memo writing acts as a link between coding and analysis, and forms an intermediate step to encourage reflection and seeing data in new ways ' (Charmaz 2006, p.72).

Memoing was also used to categorize and group emerging themes within the data and developing codes in order to produce theoretical 'snap-shots' (example in appendix 9.0). These are condensed or concentrated forms of theoretical explanation that describe commonalities and differences occurring within the interview data. It is acknowledged within the literature that there is no set form for memos, but it is the act of memoing itself that is important. Charmaz advocates that memo writing should take on whatever form is necessary:

> The methods of memo writing are few; do what works for you. Memos may be free and flowing; they may be short and stilted–especially as you enter new analytical terrain. What's important is to get things down on paper and stored in your computer files. Keep writing memos however you write and whatever way advances your thinking.
> (Charmaz 2006, p.80).

The author found it was at times necessary to develop memos in visual form in relation to how design experts were describing aspects of their practice. This was in order to gain deeper insight. The author has termed this 'Empathic Memoing' and is described below in section 3.7.2.

3.7.2 Empathic Memoing

As part of the process of memoing in this study, a particular form of memoing was developed and used by the author in order understand and explicate detail and incidences within the data. The author found that whilst memoing – in order to make clear to himself instances where participants may be describing aspects of design process or phenomena within the data – it was necessary at times to produce practical design work that aligned with the descriptions of the processes that participants gave. This afforded him to further abstract or conceptualize descriptions at an analytical level. The author has termed this particular method of memoing 'Empathic Memoing'.

Empathic Memoing helped the author develop insight, knowledge and experience by producing design work in accordance with the methods of process described by participants. This was conducted in order to form an 'empathetic' perspective of their account or description before raising conceptual and theoretical written memos that led the generation of theory elevated from the data.

Figure 3.7.2 shows an example of the visual elements related to an 'Empathic Memo'. This visual Empathic Memo raised the theoretical theme 'Synthetic Acquiescence' that is discussed within section 4.2.2.6.1. In this particular instance, Empathic Memoing was utilised to clarify what experts were saying in relation to approaches to extrapolating* and interpolating* form. Here, the results can be seen of interpolation between two extremes of heavyweight and lightweight type forms, where altering the extremes only result in the creation of a continuous range of forms.

Figure 3.7.2
An 'Empathic Memo' showing how an 'Acquiescence' takes place in terms of synthetically generated form. By working the extremes only, the designer does not create the interpolated variants but 'Acquiesces' in allowing software to generate and control the intermediate forms. Empathic Memoing of this nature enabled the development of written memos and theory development to become sharper in relation to the coded primary data, offering greater clarity and insight for the author.

Empathic Memoing allowed the author of this study to experience first hand phenomena discussed within the data to gain greater understanding of the participants' descriptions of design process. The author acknowledges that he has prior experience and knowledge that would help in terms of skill and ability to undertake such practical work. In this study the author has developed a unique and specific form of memoing relative to this research. The intension is that this form of memoing serves a particular purpose for this research. However, forms of Empathic Memoing could work in other areas and disciplines, where greater experiential insight gained through 'empathetic' mirroring of actions and or experiences could lead to greater appreciation or tacit understanding of the research participant's world view. This would aid in abstraction, conceptualisation and theorizing from coding, memoing and analysis.

Parallels to the author's method of Empathic Memoing can be found in examples of qualitative coding of data with respect to 'in vivo' codes. In vivo codes refer to coding participant's use of language where words may have special or specialist meaning. Charmaz describes three forms of in vivo codes:

- Those general terms everyone 'knows' that flag condensed but significant meaning.
- A participant's innovative term that captures meanings or experience.
- Insider shorthand terms specific to a particular group that reflect their perspective. (Charmaz 2006, p.55)

Charmaz goes on to argue that:

> Unpacking such terms not only gives you a great opportunity to understand implicit meanings and actions but also make comparisons between data and with your emerging categories.
> (Charmaz 2006, p.55)

The author argues that Empathic Memoing can help unpack further meaning and understanding in terms of experience that the participant describes. As language may be particular to an individual, group or situation, so too are certain experiences and actions. Unpacking 'empathetically' may be one way to gain greater insight where appropriate, possible and permissible. The author acknowledges that it may not be possible in many cases and scenarios to conduct Empathic Memoing, but that it may be an additional useful methodological tool for developing thinking, analysis and theory in certain instances in relation to data where memoing is being used to develop thinking at the conceptual level.

The development of Empathic Memoing as part of this study adds a new research method to the cannon of qualitative research and Grounded Theory Methodology. The author also claims this as a contribution to knowledge generally.

3.7.3 Emerging and developing theory

Theory generated in this study is of an explanatory nature. This is developed from raised categories and concepts that emanate from the constant comparative analysis of data, grounded and supported by the data in terms of its explication. For this study, theory is not argued for in terms of formal theory, but remains purposefully substantive in order that it addresses the specific aims of this research. As with other aspects of Grounded Theory Methodology, theoretical concepts began developing early in the research in relation to coding, memoing and the constant comparative method. Constant comparison and memoing continued through the later stages of the research in order to refine and develop theory. Theory strengthened as codes became theoretically saturated (Glaser & Strauss 1967, p.111). This meant that as theory sharpened, it was easier to identify instances within and across data where commonality of incidents and categories appeared, and that these could be coded accordingly.

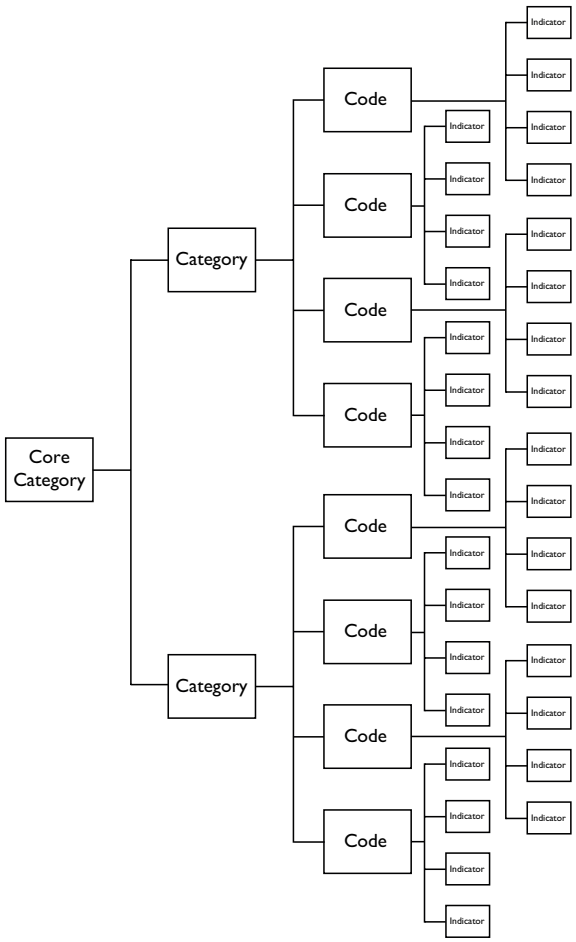


Figure 3.7.3
Diagram illustrates a typical relationship between core category, (sub-)categories, codes and instances within the data. This shows typified connections of raised levels of concepts/theory developed from, but also grounded by the data.

Negative incidents that were found in relation to a category were also coded, categorized and developed as part of the emerging theory. Memoing aided developing theoretical concepts and the 'sorting' of memos in turn aided the development and presentation of theoretical core categories. Figure 3.7.3 depicts the nature and integration of the relationships between incidents within the empirical data up through coding, developed categories and finally core categories at a developed theoretical level. This illustrates how the presentation of theory is raised from but remains grounded to the data. Whereby examples of the primary data can be linked to and used to illustrate concepts at the various levels of theoretical abstraction.

Glaser describes the importance of 'sorting' relative to Grounded Theory Methodology: 'the theoretical sorting of memos is the key to formulating the theory for presentation to others whether in words or writing' (Glaser 1978, p.116). The writing up of theory in this research is based around the core categories as will be seen in chapter 4.0. Glaser describes this form of presentation in relation to developed theory generation: 'Since the theory will be generated for a core variable, the rule is to begin sorting all other categories and properties only as they relate to the core category' (Glaser 1978, p.121). The presentation of the theory within the following chapters will take the form of a top-down perspective of the core categories, sub-categories, codes and indicators. Extracts from the data will be used to illustrate and ground the theory presented.

3.8 Summary

This chapter has set out the rationale and reasoning for the selection of the research methodology for this study as Grounded Theory Methodology in line with the aims and concerns of this research. It has also been argued why the choice of Grounded Theory Methodology was selected over other competing methodologies and paradigms.

This research has includes interviews with expert participants which were recorded, transcribed, coded and analysed. Interviews took place over the period beginning November 2009 and ending in June 2013. These were

conducted in the UK, Ireland and USA and included an initial pilot interview employing the strategy of using a key informant in order to open the enquiry in terms of sampling. Subsequent sampling was in line with the Grounded Theory Methodology orthodoxy of Theoretical Sampling. The latter developing from the cyclical steps of coding constant comparison and memoing. This aided the development of theory. The theory presented in this thesis is based around three core categories (chapters 4.0, 4.1, 4.2 and 4.3) which are developed from and grounded by the primary data.

A claim of a contribution to knowledge is made by the author with respect to the unique collection of interviews with world-leading text typeface design experts that have been recorded and analysed as part of this research.

A claim of a contribution to knowledge is also made in terms of the author's developed Empathic Memoing method, which augments the orthodox Grounded Theory method of memoing. This was developed by the author in order to gain further and deeper insight with respect to knowledge imparted by the participants of this research. Empathic Memoing included recreating or mirroring aspects of design as experience in order to develop understanding and consequently aid the development of theory from this.

Finally, this chapter has also outlined the way in which the Grounded Theory developed and is presented based around the theoretical core categories that are described within the following chapters of this thesis.

4.0 Processes of text typeface design: Introduction

Contents

4.0 Processes of text typeface design: Introduction

4.0.1 Introduction

This chapter represents analysis and interpretation of the gathered research primary data that is resolved in the form of developed Grounded Theory. This study set out to investigate if it would be possible to reveal aspects regarding the design processes of Latin text typeface design, based upon accounts given by experts in their field, that could lead to theoretical renderings of such processes. Grounded Theory was the selected methodology utilized. No preconceived hypothesis or hypothesis testing was employed as a research methodology. The wealth of primary data gathered from participants in this study provided rich, in-depth accounts of expert designer knowledge relating to practices, decision-making and personal viewpoints relative to Latin text typeface design. The data also included much in the way of what may be described as tacit knowledge (Polanyi 1967) relating to the processes of text typeface design. This is specific design knowledge that this study is able to reveal through analysis and developed theory as a result of the identification of emergent patterns of similarity and difference within the data. The concepts and interrelationships developed from the emergent patterns in the data enabled the generation of theoretical descriptions and explanations that subsequently follow in the respective discrete sections of this chapter as outlined below.

4.0.2 Presentation of the Grounded Theory

Beyond this introduction, this chapter is divided into three main sections, these are: 4.1 Trajectorizing, 4.2 Homologizing and 4.3 Attenuating. Each section articulates and evidences developed Grounded Theory relating to individually raised core categories. Each section also includes respective sub-categories and coding relative to the main core category. Core categories and sub-categories have been developed through a process of constant comparative analysis of primary data in conjunction with memoing, theoretical coding and sorting in accordance with Grounded Theory

Methodology (Glaser & Strauss, 1967). This constant, iterative, inductive process of continual analysis and theory generation has allowed for emergent theoretical concepts to be raised from the initial primary data.

Theory and analysis, presented here as three core categories, has been raised from, but remains grounded by the substantive coding at the primary research data level. Examples of the primary data itself are used within this chapter to illustrate, evidence and support the developed categories and theoretical assertions, descriptions and explanations resolved as Grounded Theory. Each of the following sections relating to the core categories in this chapter will contain a table within their respective introductions that will illustrate the connections and hierarchies between core category, sub-category and substantive coding.

The Grounded Theory developed in this study offers explanatory theory in relation to expert knowledge of text typeface design process. The developed theory within the following sections can be seen as raised beyond a mere descriptive analysis through the rigorous application of Grounded Theory Methodology. Within this chapter the series of abstracted theoretical assertions that appear within the following sections are raised inductively from the data and illustrated by exampling with extracts from the primary data. The presentation of the Grounded Theory appears as blended analysis and supportive descriptions in relation to developed concepts. Charmaz describes this form of rendering Grounded Theory writing in that it:

> …blends analytical statements with supporting description and illustration. It thus moves back and forth between theoretical interpretation and empirical evidence. (Charmaz 2006, p.152–153)

The three individually resolved core categories each represent an emerged and resolved theoretical concept that accounts for deep structures and connections of multiple variables relative to text typeface design process or processes. The presentation of core categories as separate sections within this report is to facilitate conceptual clarity and also to allow the reader to see the clear progression of the hierarchy of raised concepts and their direct connections with the primary data. This aligns with what Glaser describes

when discussing the writing up of Grounded Theory core categories:

> Many studies yield two or (sometimes) three core variables. To try to write about them all at once with no relative emphasis is to denude each of its powerful theoretical functions. (Glaser 1978, p.94)

Reflection on and integration of aspects of the individual core categories with one another, along with integration of aspects of the literature will be developed with the subsequent chapter – 5.0 Discussion.

4.0.3 Definitions of developed core categories and sub-categories

Each core category includes respective sub-categories, these will be discussed at length further in the relevant chapter. Core-categories represent conceptual categorizations that are described as 'causal' – these represent actions and behaviours. Respective sub-categories within this study are classified as causal, conditional, consequential or contingent in their relation to core categories. Table 4.03 details the relationships and interrelationships between the core and sub-categories developed in this study. The definitions of core categories and their respective sub-categories align with five of the definitions of theoretical coding families described by Glaser as *The Six C's* – 'Causes, Contexts, Contingencies, Consequences, Covariances and Conditions' (Glaser 1978, p.74).

Table 4.03
Table showing relationships of core categories to respective sub-categories in this study relative to five of Glaser's Six C's theoretical coding families.

Core Category	Sub-Categories			
Causal	Causal	Conditional	Consequential	Contingent
Trajectorizing	**Precedent Constructing**	**Contextualizing**	**Constructed Precedent**	
Homologizing	***Extrapolation**** ***Interpolation**** Synthetic Acquiescence (dimension) Synthetic Displacement (dimension)	**Endogenous Generation** Homologous Mapping (dimension) Homologous Drift (dimension)		**Endogenous Generator**
Attenuating		**Attenuation**	**Accretive Amelioration**	**Envisioning** **Historical Immersion**

It is stressed that the categories described in Table 4.03 were developed emergently and inductively from the data over time. These were found to have fit with aspects of Glaser's 'Six Cs', rather than using such existing frameworks of theoretical coding families to 'force' the data to fit such pre-existing theoretical categorization and organization. In this sense, alignment of emergent concepts from the data with Glaser's 'Six C's' has been of benefit in framing and clarifying emergent conceptual themes as opposed to utilizing the existing framework as a prescriptive tool for rendering concepts. The latter would have ultimately led to forcing potentially preconceived concepts to fit a conceptual framework rather than emerging conceptual fit, as was the case in this study.

4.0.4 Core categories and their interrelationship

Allowing concepts to emerge without forcing a conceptual framework from the outset has resulted in a theoretical completeness in terms of each of the core categories. These can be seen as stand alone theoretical concepts around which the sub-categories and substantive codes resolve. Moreover, and as will be discussed in chapter 5.0 Discussion, the three core categories developed in this study also resolve and interrelate to one another, rendering a deeper and ultimately more multivariate Grounded Theory that elucidates deep structures relative to the whole process of text typeface design developed from, and grounded by, the accounts of leading experts in the field of text typeface design.

Figure 4.04 illustrates the interrelationship of the core categories to one another. This is shown here to give the reader an impression of how the core categories coexist before commencing reading the individual sections themselves. Whereas Trajectorizing and Homologizing actions have definitive and arguably, delimited roles within the development of text typeface design, Attenuating has an enveloping quality, that can be seen as constantly present throughout the process of text typeface design. Attenuating is inexorably connected to both core categories Trajectorizing and Homologizing as part of the overall design process relative to text typeface design. Again, a detailed discussion with regard to the

interrelationship of the core categories, their sub-categories and codes, where relative, along with relevant reference to the literature will be considered subsequently within this thesis.

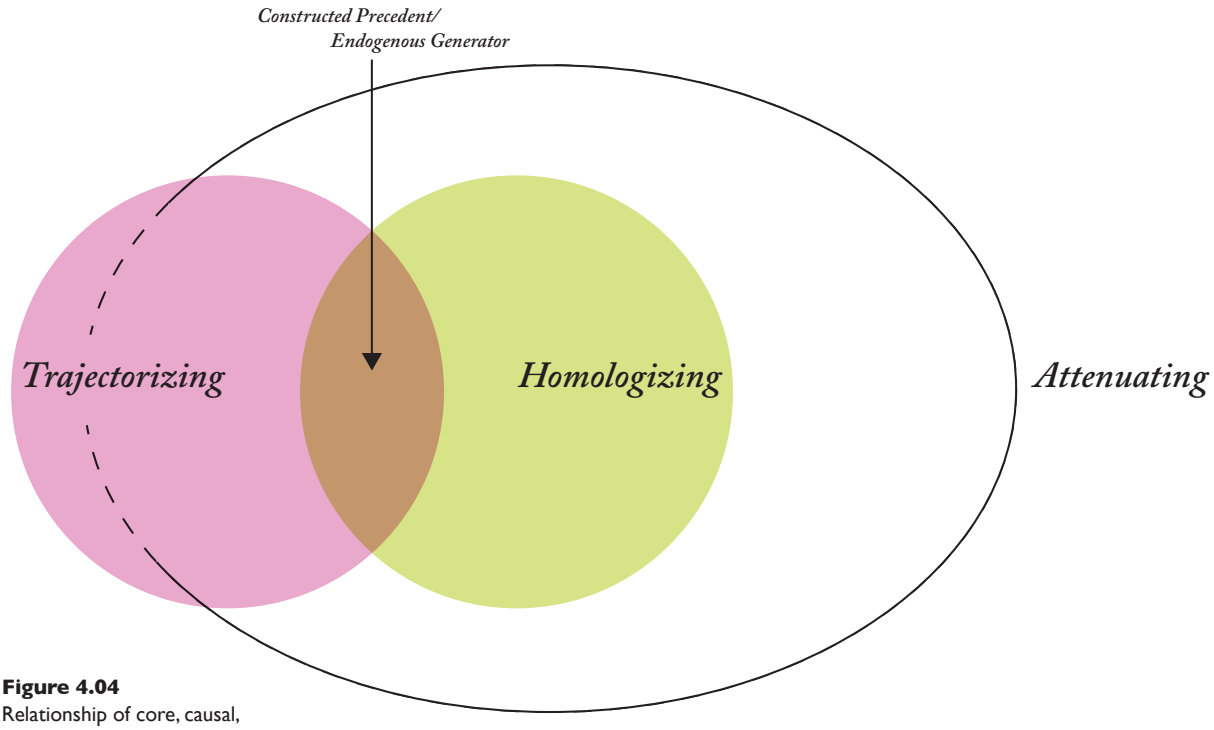


Figure 4.04
Relationship of core, causal, action categories linking Trajectorizing and Homologizing relative to Attenuating.

4.0.5 Summary

The core categories describe and explain sets of actions that are brought to bear upon the design and development of text typeface designs as part of the process, or rather processes of design. The renderings of three core categories are presented hereafter as explanatory Grounded Theory, raised from and grounded by the primary data. The developed theories not only describe processes of text typeface design, but it is anticipated that the themes raised and concepts developed in this research will serve as potential analytical tools that will be used in the further study and research of text typeface design practices and processes. Additionally, the developed theories may also find use in applied situations relative to the practice of text typeface design. It is also anticipated that the developed theoretical descriptions may bring greater conceptual clarity to the explication and understanding of discrete causalities relative to the overall process of text typeface design, thus facilitating aspects of teaching and education in relation to Latin text typeface design.

4.1 Processes of text typeface design: Trajectorizing

Contents

4.1 Trajectorizing

4.1.1 Introduction

This section outlines the developed core category **Trajectorizing** and its related sub-categories **Contextualizing**, **Precedent Constructing** and **Constructed Precedent**. As in the sections that follow (4.2 and 4.3), the relationship of core category and relative sub-categories is highlighted with reference to Glaser's theoretical familial categories – the Six Cs (Glaser 1968). Table 4.1.1 shows the relationship of Trajectorizing and its sub-categories aligned to Causal, Conditional, Consequential and Contingent categorizations, these relationships will be described further within this section below.

Core Category	Sub-Categories		
Causal	Causal	Conditional	Consequential
Trajectorizing	**Precedent Constructing**	**Contextualizing**	**Constructed Precedent**

Table 4.1.1.1
Relationship of the core category *Trajectorizing* to sub-categories

In this and the subsequent sections 4.2 and 4.3, the raised core and sub-categories are developed as Grounded Theory as described in the introduction to this chapter (see 4.0). Table 4.1.1.2 shows the relationship of the core category Trajectorizing and its developed sub-categories: Contextualizing, Precedent Constructing and Constructed Precedent. This table also shows the relationship of sub-categories to the substantive coding and coding descriptions relative to coding at the primary data level. This makes explicit the hierarchical lineage of the raised conceptual categories relative to coding at the data level. As will be found in sections 4.1 and 4.2 also, extracts from the primary data will be used to illustrate and evidence developed theoretical concepts and assertions.

Trajectorizing – Codes relating to core category

Sub Cat > Code	Definition
Contextualizing	
DefDesSearch	Participant defining the search space (heuristic)
DesDecRelProb	Participant describes design decision related to problem
DesDelimiters	Participant outlining the design perimeters for specific problem(s) – general
DesDelimiters Client	Participant describes CLIENT outlining the design perimeters for specific problem(s)
DesDelimiters Self	Participant describes self outlining the design perimeters for specific problem(s)
Des Prob Inherent	Participant identifies an inherent problem/area in approaching text typeface design
DesignSpaceID	Participant identifies distinction in approach to design.
PrimaryGen	Participant describes Initial design influence or drawn influence prior to the process of design
Redefining brief	Participant describes scenario where the client brief is redefined
Ref Other prior	Participant states making reference to OTHER prior work to develop the typeface design
Ref Other prior NEG	Participant states NOT making reference to OTHER prior work to develop the typeface design
Ref Own Prior	Participant states making reference to their OWN prior work to develop the typeface design
Ref Own Prior NEG	Participant states NOT making reference to their OWN prior work to develop the typeface design
Repertoire	Participant indicates that an existing repertoire of actions or decision making in relation to type design is used.
Repertoire Neg	Participant indicates that an existing repertoire of actions or decision making in relation to type design is not used.
Precedent Constructing *+ Constructed Precedent (Consequential)*	
Des Micro	Participant describes/acknowledges details relating to a micro level view/notion of design
FirstChars Uc	Participant describes Letters designed initially for the UPPERCASE
FirstChars lc	Participant describes Letters designed initially for the lowercase.
Letter parts	Participant describes/is aware of the component parts that make up letterform

Table 4.1.1.2
Table showing lineage and relationships of coding at the substantive level up through conceptual categories with reference to the core category

4.1.2 Trajectorizing

Trajectorizing as a core category provides explanation as to how the text typeface designer initiates, negotiates and directs the early stages of text typeface design by developing impetus and momentum in the process. This includes the development of form or forms relative to the first characters produced in the typeface, sometimes referred to as control characters within the process of design. A Trajectorizing form within the design can be determined as forms that the text typeface designer produces not only as first characters or parts of characters but initial forms that will have the potential to inform subsequent forms later in the process of design. Trajectorizing describes how designers draw from influences to create new initial form, and how that new form in turn establishes the direction and allows for the potential generation of subsequent form within the system of text typeface design.

Trajectorizing as a core category describes how the text typeface designer primes the burgeoning process of design. This core category rationalizes multivariate phenomena that explain how text type designers draw from influences and precedents explained in this research by means of the sub-category Contextualizing. Initial influences can be distal/broad or proximal/focused in nature, specifically in relation to designers' knowledge and experiences. Trajectorizing conceptualizes how the text typeface designer utilizes Contextualizing influences and precedents alongside Precedent Constructing by way of producing purposeful, determined starting points within the system of design. These determined starting points allow the text typeface designer potential to continue to develop the text typeface design based on initial design decisions and actuations. Contextualizing and Precedent Constructing account for the text typeface designer's actions of converting extrinsic influences towards intrinsic influences in relation to the process of text typeface design. Thus creating potential for the developing design to subsequently become self-informing via Constructed Precedents.

This section therefore presents evidence that supports the developed Grounded Theory core category **Trajectorizing** and its supporting sub-categories. Coded extracts from the primary data will be used to substantiate

and illustrate the developed Grounded Theory categories discussed above.

4.1.3 Contextualizing

As a Trajectorizing action, text typeface designers are engaged in not only aiming in terms of giving their initial letterforms form and structure as Constructed Precedents, they are also Contextualizing. Contextualizing can be seen as conditional to Trajectorizing in that whereas the latter sees designers giving direction and aiming, giving potential to the undeveloped design, the former sees the designer, identifying, shaping, forming, scoping or discovering the target they are Trajectorizing toward. Contextualizing allows the designer to ground or begin to make sense of what it is they are aim for, or at.

Contextualizing can be in the form of delimiting or identifying and narrowing the search space. However, Contextualizing can also be in the form of identifying precedent, following precedent or allowing serendipitous influences to impinge upon the design process in such ways as Jane Darke's identified Primary Generator (1979) (see Literature Review, section 2.3). The commonality that links all of these forms of phenomena or activity, is that they allow the designer to identify a target. Contextualizing describes the target designers identify as aiming at from the outset or as it emerges, whereas Trajectorizing, what they aim at that target.

If designers are closing down search spaces, they are Contextualizing what their design will be aimed towards. If designers are following precedent they are identifying that their design will be informed or influenced by a specific(s) form. Therefore, they are initially aiming at producing something similar to the specific. If designers are relying on repertoire or gambit, their design will adhere to a specific way of doing something, or specific ways of producing something. If designers identify an inherent problem to be resolved – eg. the type needs to be condensed so that more words per line can be achieved – they identify their target. The new design can be aimed at a specific target. Expert designers are thus Contextualizing their Trajectorizing actions.

4.1.3.1 Contextualizing Initial influences – broad to focusing

Text typeface designers draw upon various precedents and generators relevant to the scoping of the initial search space for text typeface design. Certain instances of initial influences can appear broad and at times somewhat removed from the nature of text typeface design itself:

{ExampleExperi}{DesignSpaceID}{PrimaryGen}
Extract 1 (JFP_1, lines 175–176)

> '…because I have this ideas of sixties seventies you know …'.

Such initial influences can lead to more specific generator-like influences:

{ExampleExperi}{DesignSpaceID}{PrimaryGen}
Extract 1 (JFP_1, lines 176–177)

> '…I have in mind at the time Letraset catalogues … Mecanorma catalogues … photo lettering things…'.

eventually leading to specific precedent-like influences:

{ExampleExperi}{DesignSpaceID}{PrimaryGen}
Extract 1 (JFP_1, line 178)

> 'Lubalin'.

In this aspect of Contextualizing designers make links between initial broad and disparate influences in terms of how text typeface design may begin. Initially broad influences then become linked to more specific influences as the process progresses.

Broad and multivariate influences can be in the form of somewhat vague potential starting points:

{DesDelimiters}{FromKnowledge}{PrimaryGen}{DefDesSearch}
Extract 2 (JT_1a, lines 51–55)

> '…I'll be thinking about the next typeface as I'm working on one already so that could be an initial idea but even then … this idea which is for another sans serif I've had that idea bubbling around in my head in a very foggy way for maybe a year or two potentially but they're just all stored so it's hard to say when something actually begins…'.

Such links between initial broad ideas and feelings may then become more focused over time in terms of where influences may be derived from:

{DesDelimiters}{FromKnowledge}{PrimaryGen}{DefDesSearch}
Extract 2 (JT_1a, lines 60–72)

> '…so initially there'll be an idea it may have come from who knows where they come from or just a thought will plop pop in my head and it can be to do with something you've seen and you think ah that would be interesting well maybe I should do that or it's the reaction to something you've seen somewhere I can't say where that initial sort of thing will come from … but then they sort of tie in with other things for me a lot of it's with music or … films or what ever it could be the weather it could be a nice it could be like you've just gone for a walk … you've seen an exhibition somewhere and you've been particularly taken by something or you're just in an elated mood or whatever you've just

heard a piece of music and something all just goes click and you think wow that's the feeling I want to capture I want to get that high and make it would be really nice if I could do that whatever that is and then that becomes more focused as time goes on y'know…'.

The designers' references to broad initial influences may become more specific in terms of their generator-like nature, specifically with reference to previously designed typefaces:

{DesDelimiters}{FromKnowledge} {PrimaryGen}{DefDesSearch} Extract 2 (JT_1a, lines 72–75).

'…Kingfisher was initially inspired by … sort of a lot to do with … Lisa Gerrard's voice in Gladiator the soundtrack this sort of very echoey Moorish sound … and also having travelled round Spain and seeing all the Moorish architecture so that all came from there…'.

Initial influences can be specific in nature but somewhat unrelated to the subject of typeface design:

{DesDelimiters}{FromKnowledge} {PrimaryGen}{DefDesSearch} Extract 2 (JT_1a, lines 82–83)

'…William Golding's sea trilogy…' and 'Regency period'.

However, these may lead to connections with phenomena related directly to typography and typeface design:

{DesDelimiters}{FromKnowledge} {PrimaryGen}{DefDesSearch} Extract 2 (JT_1a, lines 84–87)

' … typographic based stuff like Tschichold his ideas of type mixing … post Napoleonic eighteen thirties where you had all that explosion of the new types of the display types…'.

Influences can in turn become further specific with regard to typological models or styles of typeface from which influence is derived:

{DesDelimiters}{FromKnowledge} {PrimaryGen}{DefDesSearch} Extract 2 (JT_1a, lines 94)

'Egyptians and Fat Faces'.

These forms of broad to focusing forms of Contextualizing give insight to the developmental links designers make between heuristic or disparate early initial influences and how these may become focused by way of linking to other influences closer to the nature of the subject area of typography and type design. This offers the designer more in the way of tangible starting points in terms of Contextualizing any initial design form from early ideas and influences. The movement here in terms of the process is of rationalizing thinking towards possible in-roads from multivariate influences in the initial stages to specific influences more clearly aligned to the nature of typeface design itself.

Extract 1

JFP_1	**{ExampleExperi}{DesignSpaceID}{PrimaryGen}**
175	… because I have this ideas of sixties
176	seventies you know I I have in mind at the time Letraset
177	catalogues + Mecanorma catalogues + photo lettering things +
178	Lubalin

Extract 2

JT_1a {DesDelimiters}{FromKnowledge}{PrimaryGen}{DefDesSearch}

… I'll be thinking about the next typeface as
I'm working on one already so that could be an initial idea but even then but
even this idea which is for another sans serif I've had that idea bubbling
around in my head in a very foggy way for maybe a year or two potentially but
they're just all stored so it's hard to say when something actually begins because
other things come forward be it a commission or be it a current typeface is
taking longer than I thought it would take because of whatever erm Kingfisher for
instance was like was only meant to be a year job and it took four years in the
end because things came along which pushed it back to the shelf and blah blah
blah erm so initially there'll be an idea it may have come from who knows where
they come from or just a thought will plop pop in my head and it can be to do
with something you've seen and you think ah that would be interesting well maybe
I should do that or it's the reaction to something you've seen somewhere I can't
say where that initial sort of thing will come from erm but then they sort of tie
in with other things for me a lot of it's with music or erm films or what ever it
could be the weather it could be a nice it could be like you've just gone for a
walk eh you've seen an exhibition somewhere and you've been particularly taken
by something or your just in an elated mood or whatever you've just heard a
piece of music and something all just goes click and you think wow that's the
feeling I want to capture I want to get that high and make it would be really
nice if I could do that whatever that is and then that becomes more focused as
time goes on y'know Kingfisher was initially inspired by erm sort of a lot to do
with the eh Lisa Gerrard's voice in Gladiator the soundtrack this sort of very
echoey Moorish sound erm and also having travelled round Spain and seeing all the
Moorish architecture so that all came from there nothing to do with the final
typeface but it all came from this particular thing and I can say noth I can
hide that and not talk about those very esoteric kind of influences but then
that those kind of things make me do what I do so I can't neglect that and I
stopped fighting against it or necessarily being embarrassed about it because
that's me that's the way it is erm trilogy for instance trilogy a lot of that
came from oddly enough erm + well a lot of things come from the sea so that was
em William Golding's sea trilogy erm + there was what else was there in there eh
Regency period as well as a more sort of graphic or typographic based stuff like
Tschichold his ideas of type mixing but then hence they all sort of tie together
in my own head so Tschichold his idea of type mixing was nineteen thirties going
back a hundred years to Regency period or post Napoleonic eighteen thirties
where you had all that explosion of the new types of the display types so that's
why it all knits together happily that way and then did a lot of research on
Regency things and got into all side of stuff and eh and what was happening with
that sort of era erm To The Ends Of The Earth was a three part televised
dramatization of William Golding's sea trilogy and hence Trilogy there's three
so there's all sort of came from this kind of baggage erm then it becomes what it
is but there's because of that sort of interest in in the Regency period the
types of that the start of display types the Egyptians and Fat Faces erm + that
that fuelled what it became and I didn't really want to take it into anything erm
too sort of eh too different I wanted to be quite true to those initial ideas
within there but also bring it up to date in a different kind of way hence I
suppose was the idea Tschichold or a different take on the idea of a super
family instead of having the same structure is actually having three different
styles drawn to work together in some way erm and that was interesting

4.1.3.2 Contextualizing specifically through language

Experts evidence the movement from initial broader influences to those of a more focused nature by means of generators and precedents in the early stages of design. Expert designers also utilize supportive language to facilitate greater clarity in scoping initial thinking and working relative to the design space

{DefDesSearch}{DesignSpaceID}{DesDelimiters_Self}{Ref_Conv_Broad}{FromKnowledge}{Des_Macro}{PrimaryGen}
Extract 3 (JT_1a, lines 181–183)

> '…a family of black block letterforms heavy based on wood modern expanded standard compressed sans slab serif…'

Such use of notational language can enable Contextualizing conceptual framing with regard to initial design and its positioning

{DefDesSearch}{DesignSpaceID}{DesDelimiters_Self}{Ref_Conv_Broad}{FromKnowledge}{Des_Macro}{PrimaryGen}
Extract 3 (JT_1a, line 183)

> '…nine typefaces on a grid three by three…'

Used in this way, language offers a clarifying element in the development of visual matter offering a logically generative support employed by the designer to scope and aim the potential development of the design as part of the act of Trajectorizing:

{DefDesSearch}{DesignSpaceID}{Proced_Dev}{Letter_parts}
Extract 4 (CS_1, lines 137–140)

> '…and pick things apart sort of to understand how the component parts work together how the arch of an n works with the terminal of an a and and how all of the things create a mood and a time and a place…'.

The purposeful use of language in this way aids the direction and development of initial visual matter. This enables the designer to improve focus and potential in the early stages of design thinking:

{DefDesSearch}{DesignSpaceID}{Proced_Dev}{Letter_parts}
Extract 4 (CS_1, lines 137–140)

> '…so it's really … once we have the vocabulary both in terms of visual things and verbal things that's when we start drawing…'.

Extract 3

JT_1a	**{DefDesSearch}{DesignSpaceID}{DesDelimiters_Self}{Ref_Conv_Broad}{FromKnowledge}{Des_Macro}{PrimaryGen}**
181	… a family
182	of black block letterforms heavy based on wood modern expanded standard
183	compressed sans slab serif nine typefaces on a grid three by three italic forms
184	too

Extract 4

CS_1	**{DefDesSearch}{DesignSpaceID}{Proced_Dev}{Letter_parts}**
137	… and and pick things apart sort of to
138	understand how the component parts work together how the arch of an n works with
139	the terminal of an a and and how all of the things create a mood and a time and
140	a place erm so it's really we once we have the vocabulary both in terms of visual
141	things and verbal things that's when we start drawing

4.1.3.3 Contextualizing via specific influences and precedents

For expert text typeface designers, Contextualizing draws heavily upon the use of specific precedents (relative to Historical Immersion see 4.3) as a key element in influencing the initial stages of Trajectorizing. In relation to this aspect of the process, specific historical models or knowledge of specific prior design, relates to identifying direct influences that impact on the sense of positioning the developing design. Contextualizing in such specific ways enables the Trajectorizing of form for the developing design to be accurately positioned. In this sense, the notion of conjecture is narrowed and contained by the expert to fit within fine tolerances. Contextualizing such explicit precedents directly influences the design of form in the process. Initial precedents constitute singular or multiple direct influences in developing initial form relative to Trajectorizing new designs. Singular precedents may take the form of prior or existing typeface design:

{Comparison}{PrimaryGen}
{Collaboration}{Ref_Other_prior}
{Ref_Own_Prior}
Extract 5 (RN_2, line 64)

'Bembo'.

Such initial precedents can act as both the starting point for the new typeface but also as a means of departure in terms of improving the design:

{Comparison}{PrimaryGen}
{Collaboration}{Ref_Other_prior}
{Ref_Own_Prior}
Extract 5 (RN_2, lines 63– 64)

'…make it [Dante] … a better book face than the digital version that existed at that time…'.

Such specific Contextualizing of 'Bembo', allows not only for Trajectorizing new design 'Dante', but also that the aim or objective that the new design 'Dante' has the potential to perform or function better in some way (This example also illustrates action particular to the core category **Attenuating**, which is discussed at length within this chapter at 4.3):

{Comparison}{PrimaryGen}
{Collaboration}{Ref_Other_prior}
{Ref_Own_Prior}
Extract 5 (RN_2, lines 69–70)

'…trying to improve on what we already had for Bembo…'.

Extract 5

RN_2 {Comparison}{PrimaryGen}{Collaboration}{Ref_Other_prior}{Ref_Own_Prior}	
60	RN: I think I think that does depend on the project you're working on erm + I eh
61	I mean I can clearly remember working with Ron Carpenter on Dante when we were
62	making a digital version of Dante erm what we were really trying to do was to
63	make it eh a better book face than the digital version that existed at that time
64	of Bembo
65	MH: hm
66	RN: erm because I think the conversion from Bembo erm from hot metal into digital
67	well into phototypesetting and into digital type hadn't been particularly well
68	done and it had its shortcomings and with Dante because it's a sort of fairly
69	closely related design we were trying to improve on what we already had for
70	Bembo so sometimes there is a sort of clear objective in that way erm

Contextualizing precedents may also take the form of multiple precedents from which a synthesis of factors can enable new design to progress:

{DesignSpaceID}{DesDelimiters}{PrimaryGen} Extract 6 (ES_1, lines 88–96)

> '…and then you look around you know what kind of fits in there you know is this Baskerville or Garamond or Bodoni … you know what is the sans gonna be like is this sort of like a Gill or a Futura…'.

Designers may plan initially to both contextually situate the new design in relation to existing designs but also to directly derive influence in terms of how the initial form of the new design may be developed or mapped from models selected as precedents. Situating multiple precedents in relation to each other may be derived by logical means eg.

{DesignSpaceID}{DesDelimiters}{PrimaryGen} Extract 6 (ES_1, line 91)

> 'matrixes',

in terms of position and juxtaposition:

{DesignSpaceID}{DesDelimiters}{PrimaryGen} Extract 6 (ES_1, line 92)

> '…Futura there Gill there…'

Such positioning of multivariate precedents enables the Trajectorizing of the new design to be aimed within a contextual framework of selected precedents:

{DesignSpaceID}{DesDelimiters}{PrimaryGen} Extract 6 (ES_1, lines 94–96)

> '…and you say well eh we need to be you know somewhere here in that in that square … you know like top right maybe towards the humanistic but not quite Gillish…'.

Extract 6

ES_1	**{DesignSpaceID}{DesDelimiters}{PrimaryGen}**
88	and then you look around you know what kind of fits in there you
89	know is this Baskerville or Garamond or Bodoni + erm you know what is the sans
90	gonna be like is this sort of like a Gill or a Futura so you mark your stake as
91	it where your outlines + right you know so + well I actually do matrixes so
92	futura there Gill there + eh you know geometric + or Avant Garde Gothic whatever
93	you know I wouldn't touch that but you know what I mean sort of and and erm
94	humanistic and you say well eh we need to be you know somewhere here in that in
95	that square + you know like top right maybe towards the humanistic but not quite
96	Gillish

Degrees of specificity as to how and where precedents may be derived from in relation to the act of Contextualizing can vary greatly. These can range from the broad and heuristic to the focused and particular. In either case, the use of precedent or precedents enable experts to initiate thinking and or action in the process of designing. Influence can be as broad as a collection

of associated historical models:

{DesignSpaceID}{DesDelimiters}{DefDesSearch}{Proced_Dev}{Ref_Know_Hist_Cont}{PrimaryGen} Extract 7 (JT_1a, line 206)

'English vernacular'.

More specific influences can include drawing historically from the way in which a particular designer is known to have worked. In terms of Contextualizing, this may still result a group of precedents that seemingly work on simultaneous levels:

{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase} Extract 8 (MC_1, lines 129–131)

'…I've looked at several different Granjon faces and I've taken one bit from here and one bit from there and so on you know…'.

However, potential synthesis of precedents may offer new opportunities for the expert in terms of their use in initiating new design:

{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase} Extract 8 (MC_1, 131–132)

'…and put them together in a in a configuration that … Granjon did not eh for the sake of argument…'.

Extract 7

JT_1a	**{DesignSpaceID}{DesDelimiters}{DefDesSearch}{Proced_Dev}{Ref_Know_Hist_Cont}{PrimaryGen}**
202	… this
203	thing here so (showing drawn diagram in notebook) as much as I'm doing sketches
204	of loose sketches little visual notes or whatever like little mind maps of
205	what's is interesting me a lot of these came from eh where is his book +
206	Bartram's book on English vernacular wherever he is + there's three little books
207	an there's a big anthology kind of book a collect of the three books together
208	but a lot of it comes from that

Extract 8

MC_1	**{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase}**
128	… in the case of Galliard you know I I've
129	described that as being an anthology of Granjon's work because I've looked at
130	several different Granjon faces and I've taken one bit from here and one bit
131	from there and so on you know erm and and and put them together in a in a
132	configuration that that Granjon did not eh for the sake of argument

Although expert designers evidence Contextualizing in terms of broad variation in the kinds of influences referenced and where these may directly have impact relative to the articulated design process, Trajectorizing from these is common in all cases. Experts draw influence in order to focus, aim and give direction, Trajectorizing the new design.

4.1.3.4 Referencing own prior work as precedent

Contextualizing via precedent as an element of Trajectorizing extends to expert designers explicitly referring to their own prior design work or aspects of prior design work as potentially influential toward the creation of new typeface design. This aspect of **Trajectorizing** gives insight to the ways in which designers use their own familiar prior work as a starting point to initiate a new design. The ease with which the designer is able to access data in terms of their own designed digital outlines can have a contributing influence:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 9 (ES_1, line 340)

'…because it's just there for Christ's sake why not…'.

This may provide immediate and tangible starting points for design where designers are able to work directly with pre-existing forms that will initiate the basis of a new design:

{Proced_Dev}{Ref_Own_Prior}
{FirstChars_Uc}{FirstChars_lc}
{Proced_Dev}
Extract 10 (GU_1, lines 85–88)

'…and what I … very often do is I cannibalize one of my earlier designs … all the digitization points are in the right places and the thick and thins are there…'.

The selection of the designer's own prior work as precedent can also be influenced by the perceived or apparent success or usefulness of the prior design based upon the designer's experience and knowledge:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 9 (ES_1, line 342)

'…so I used those outlines of those drawings because I know it works…'

and

{Proced_Dev}{Ref_Own_Prior}
{FirstChars_Uc}{FirstChars_lc}
{Proced_Dev}
Extract 10 (GU_1, lines 81–85)

'…I've done quite a few typefaces already so what you do is say start on a much higher level than the students here do … I don't have to reinvent the letterforms completely … I've done that a couple of times…'.

Contextualizing in this manner, based upon the use of precedents that reference the designer's own prior work, affords designers to draw upon their inherent sense of what is useful in terms of allowing for potential to develop from the selected prior design work. The use of prior successful work as a starting point, Trajectorizing the new design, potentially raises the possibility of the new design's success also as this is initiated by a prior model that the designer tacitly knows to be useful:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 9 (ES_1, line 342)

'…I know it works…'.

The design expert is able to purposefully identify potential in prior work, knowing that it will have possibility in yielding further successful development relative to a new design. The use of precedent where designers are self-referencing their own prior work may also require a combination of not only suitable prior work to draw from, but also insight on the part of the designer to be able to identify potentially useful work relative to how this may benefit the Trajectorizing aims of the initial stages of design (on this latter point see **Envisioning** in Attenuating 4.3).

Extract 9

ES_1 {DesDelimiters}{Tech_as_tool}{PrimaryGen}{Ref_Own_Prior}	
331	MH: … and are you are you that framework you talked about earlier do you use your
332	own typefaces sometimes
333	ES: yeah all the time
334	MH: to draw from
335	ES: and then I mean I did eh I did something for the german TV a couple of
336	years ago which erm I did actually draw from scratch but I knew it had to be a
337	sort of typerwriter thingy and I'm familiar with those considerably wider than I
338	would normally do but that's now become the base for a couple more screen faces
339	MH: yeah
340	ES: because it's just there for Christ's sake why not eh
341	MH: yeah
342	ES: use it so I used those outlines of those drawings because I know it works

Extract 10

GU_1{Proced_Dev}{Ref_Own_Prior}{FirstChars_Uc}{FirstChars_Ic}{Proced_Dev}	
81	GU: I've done quite a
82	few typefaces already so what you do is say start on a much
83	higher level than the students here do + I don't have to
84	reinvent the letterforms completely + I've done that a
85	couple of times + and what I eh very often do is I
86	cannibalize one of my earlier designs + all the digitization
87	points are in the right places and the thick and thins are
88	there + so what I usually do is take a couple of characters
89	from an earlier design and eh start to modify it so it
90	begins to look like something I have in mind for my new
91	design

The potential that the designer identifies within the use of a particular precedent as a starting point is utilized in the development of new design, or more correctly, action initiated by the designer whereby new form is created via the use of known or found influences. In terms of text typeface design an important and particular recurrent theme that emerged from the data was in

relation to the ways in which participants described how they worked from initial precedents, either based upon their own prior designs or influences of an extraneous nature, and in turn how these may lead to the development for the potential of new design. Extract 10 describes the way in which the participant not only begins to identify specific starting points as being important in this view to tangibly developing text typeface design:

{Proced_Dev}{Ref_Own_Prior}
{FirstChars_Uc}{FirstChars_lc}
{Proced_Dev}
Extract 10 (GU_1, lines 88–89)

> '…so what I usually do is take a couple of characters from an earlier design…',

but this also importantly illustrates phenomena relative to a key sub-category of Trajectorizing:

{Proced_Dev}{Ref_Own_Prior}
{FirstChars_Uc}{FirstChars_lc}
{Proced_Dev}
Extract 10 (GU_1, lines 89–91)

> '…and eh start to modify it so it begins to look like something I have in mind for my new design…'.

The related phenomena in this research is identified as the causal sub-category Precedent Constructing and is described below.

4.1.4 Precedent Constructing and Constructed Precedents

Type design experts not only draw upon precedent Contextualizing trajectory of new design, but also purposefully set Constructed Precedents within the process of establishing and negotiating the development of new typeface design. This includes developing a small group of initial forms or type forms that will then allow potential for a typeface design to develop further by utilizing these initially developed forms as the basis to inform subsequent form within the design. In developing particular and specific initial forms experts allow for the potential development and generation of subsequent relational form. By Precedent Constructing designers are able to develop design by attending to micro to macro/form to context like scenarios that will allow for precedent-like detail within the structure of a letterform(s) to potentially inform subsequent letterform development. In the construction of initial type form, designers aim not only to design specific initial letterforms in themselves but are Trajectorizing their initial design in such ways that this will allow them to use and build from such initial forms by means of internalized or vestigial Constructed Precedents. Such Constructed Precedents within initial form can then be followed as rule and guide to the subsequent development of form as the typeface design

continues. In this respect, experts' aims and objectives are in designing form that is determined as being sufficient to allow the details of such form to begin to set the context from which subsequent form can follow. Working with such aims in mind, designers are Trajectorizing design to eventually become self-informing. A newly designed letterform with its internalized Constructed Precedents becomes imbued with potential to act as a generator within the process of continuing design (**Endogenous Generator** see **Homologizing** 4.2).

Of particular significance is where experts describe working over, changing or manipulating form in order to depart from an original Contextualizing precedent but with the focus that such working over of form allows for the creation of a newly set precedent for the developing text typeface design. Thus, text typeface design experts create or set new precedent(s) from existing precedent(s). The result of this behaviour sees newly created Constructed Precedents that become internalized within the scheme of developing text typeface design process.

As described in the sub-sections above, precedents may take numerous forms and be derived from multiple or singular sources with respect to text typeface design. The working over of existing form affords the designer to intrinsically aim or project in terms of how a text typeface design may be informed by choices and decisions made early in the process of design by via Precedent Constructing. This enables designers to delimit and forecast in terms of Trajectorizing aspects of a new design and the effect this may have on the foreseeable typeface design. The designer's own sense of self determination in terms of what is deemed as potentially original or novel in a design is fused with what is regarded workable or functionally apposite with respect to the prospective text typeface design (for further discussion of this latter point see Envisioning in Attenuating 4.3).

4.1.4.1 Precedent Constructing from own prior work

With respect to Trajectorizing, experts commonly evidenced the working over of prior form, in order to prospectively aim at aspects of the new

design. Participants frequently referred to using their own prior work, or the possibilities of this, as starting points around which to work over and develop potential for a new design. Such possibilities of using their own previous designs can be in the form of digital outlines as starting points for new design:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1 lines 343–354)

> '…you tweak them and there's you change you know there's so many parameters you can change that make it look totally different but why and these days … that also means opening up your own data…'

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 268–270)

also reflected in

> '…I would say what have I done that's kind of like that you know and I would maybe borrow a few letters…'.

Familiarity and availability of source in terms of form appears important alongside a sense of ownership and perhaps ethical legitimacy:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1, lines 351–354)

> '…there is so much you can do by manipulating your own outlines now that's perfectly legitimate to me because they're mine I wouldn't do it with somebody else's that's one thing I have never done and never will do…'.

Working in such a manner may offer what experts see as

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1, line 347)

> '…limitless choices…'

in terms of changing the appearance of the original form by

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1, line 346)

> '…drawing over it manipulating it…'.

Specific software tools can offer experts ways in which possibilities to work from prior form may be developed:

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 263–264)

> '…why not just do it straight onto the screen you know and clean it up so that's what I do…',

and

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1, lines 346–347)

> '…we have Superpolator we have all these tools…'.

Perhaps more specifically, experts identify particular aspects of a design that may be useful or productive in manipulating or working over form in order to determine potential qualities for a new design:

{DesDelimiters}{Tech_as_tool}
{PrimaryGen}{Ref_Own_Prior}
Extract 11 (ES_1, lines 349–352)

> '…I can change the weight I can change one of the axes I can make it wider thicker thinner all at the same time and it looks a totally different typeface and then chop off the serifs add a few make the counters round or make the counters square … there is so much you can do by manipulating your own outlines…'.

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 276–277)

Also in this extract:

> '…I'd say to myself well if I make the x height bigger of this … and I beefed up the weight…'.

The references experts make in establishing initial form is one of manipulation of familiar form in order to aim at developing possibilities for the new design:

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 270–274)

> '…maybe they would eventually be changed out of all recognition but I would start with something you know again a blank screen is not is not for me … I would throw up some letters perhaps from some previous job I'd done or something and say well is this going in the right direction ah no maybe not well I'll look at something else and so on…'.

In the manipulation or development of Trajectorizing new from, experts identify possibilities of working over and changing the original form in order to determine the direction for the new design. This can involve a certain degree of adjustment or amelioration of the original (also see chapter 4.3 Attenuation):

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 274–276)

> '…I would cast around and then I would probably find something that it wouldn't work as is I mean you know but it would be something I would change…':

The direction or trajectory of a new design may be expedited by Context-ualizing via designers' own prior work and the use of the computer in terms of Precedent Constructing. However, it is the notion of starting points that appears to be significant for the design expert:

{DesignSpaceID}{DefDesSearch}
{Tech_as_tool}{Working_Phase}
{Ref_Own_Prior}{Ref_Other_prior}
{Proced_Dev}{PrimaryGen}
{FirstChars_lc}
Extract 12 (MC_1, lines 277–280)

> '…am I then going in the right direction so I would try that yeah this looks promising and so … I would depart from my starting point fairly soon … but I still would have a starting point of some kind…'.

In terms of the nature of how the manipulation of form is achieved or derived, this may take any apposite or valid method. Some experts describe the possible use software and drawing directly onto the computer as mentioned above. However, more traditional or temporal methods of drawing and manipulation via Contextualizing prior form relative to

Precedent Constructing can manifest:

{FirstChars_Uc}{FirstChars_lc}
{Mutability}{Ref_Own_Prior}
{Proced_Dev}{PrimaryGen}
Extract 13 (JT_2a, line 381)

'…Shaker's based on Enigma…',

and also

{FirstChars_Uc}{FirstChars_lc}
{Mutability}{Ref_Own_Prior}
{Proced_Dev}{PrimaryGen}
Extract 13 (JT_2a, 383–385)

'…I printed out Enigma and then either drew over through trace … another one I had liquid papered out bits to get a basic serif-less version of it…'.

Extract 11

ES_1	**{DesDelimiters}{Tech_as_tool}{PrimaryGen}{Ref_Own_Prior}**
343	and then you tweak them and there's you change you know there's so many
344	parameters you can change that make it look totally different but why and these
345	days there are also eh and these days that also means opening up your own data
346	rather you know either drawing over it manipulating it we have Superpolator we
347	have all these tools that that gives you limitness limitless choices and then
348	you can say ok well you know I can change the weight I can change one of the
349	axes I can make it wider thicker thinner all at the same time and it looks a
350	totally different typeface and then chop off the serifs add a few make the
351	counters round or make the counters square + there is so much you can do by
352	manipulating your own outlines now that's perfectly legitimate to me because
353	they're mine I wouldn't do it with somebody else's that's one thing I have never
354	done and never will do

Extract 12

MC_1	**{DesignSpaceID}{DefDesSearch}{Tech_as_tool}{Working_Phase} {Ref_Own_Prior}{Ref_Other_prior}{Proced_Dev}{PrimaryGen} {FirstChars_lc}**
258	MC: I I I don't draw by hand at all on on paper any longer erm you know for a
259	long while in the days of photocomposition I had to draw I mean I made
260	production drawings but I I don't really draw very well I mean I don't have very
261	good coordination eh motor skills so erm I gave up drawing just as soon as I
262	could erm because I thought it was a waste of time you know to make a bad drawing
263	scan it and then clean it up on the screen why not just do it straight onto the
264	screen you know and clean it up so that's what I do erm but even even if I don't
265	have a historical model or any model let's let's suppose although this seldom
266	happens to me as I say I would start from something you know I I I + it's always
267	easier to start from something than from nothing if I if I was working on a
268	particular or wanted to work on a particular kind of design I would say what
269	have I done that's kind of like that you know and I would maybe borrow a few
270	letters and maybe they would eventually be changed out of all recognition but I
271	would start with something you know again a blank screen is not is not for me erm
272	I I I would throw up some letters perhaps from some previous job I'd done or
273	something and say well is this going in the right direction ah no maybe not
274	well I'll look at something else and so on you know so I I would cast around and
275	then I would probably find something that it wouldn't work as is I mean you know
276	but it would be something I would change you know I'd say to myself well if I
277	make the x height bigger of this and I and I beefed up the weight a bit am am I
278	then going in the right direction so I would try that yeah this looks promising
279	and so so I would depart from my starting point fairly soon I would guess but I
280	still would have a would have had a starting point of some kind yeah

Extract 13

JT_2a {FirstChars_Uc}{FirstChars_Ic}{Mutability}{Ref_Own_Prior}{Proced_Dev} {PrimaryGen}

377 I've got a history of some of the types (moves over to box to look for an
378 example) + erm shaker might have it (looks through folder) (17 secs) depends
379 how far back (12 secs) these are this is naming of it so that's not it (11 secs)
380 and you can see on there I think I know why I did that that was a printout of
381 enigma Shaker's based on Enigma
382 MH: hm
383 JT: and I know that here I I printed out Enigma and then either drew over
384 through trace or erm or I know another one I had liquid papered out bits to get a
385 basic serifless version of it

As an important aspect of Trajectorizing for the expert then is Precedent Constructing via Contextualizing their own prior work. This may be as a result of the designer's tacit or experiential knowledge – knowing what works or is workable in relation to their previous designs. Self-deterministic and perspectives in terms of ownership may also influence the choice of the use of own prior work as starting points for design. However, experts' Precedent Constructing is not solely bound to Contextualizing their own prior work.

4.1.4.2 Precedent Constructing from other prior work

Precedents may include working directly from other known or found sources of existing typeface design as an aid to Contextualizing the developing new typeface design. Again, these forms of precedent aid in the Trajectorizing of the new typeface design. Experts often utilize type design not of their own making as the basis for starting points and the working over of form. Again, as is described above in section 4.1.3.1, the use of found or known sources of influence in the process of design leads to the development of Precedent Constructing. The working over and manipulation of form is actuated in a similar manner as when experts utilize their own prior work:

{Testing}{Working_Phase}{PrimaryGen}{Tech_as_tool}{Ref_Other_prior} Extract 14 (RN_2, line 122)

'having something in the background',

and leading to Precedent Constructing,

{Testing}{Working_Phase}{PrimaryGen}{Tech_as_tool}{Ref_Other_prior} Extract 14 (RN_2, lines 123–124)

'…then just work over … making the modifications I think appropriate as I go … and often sort of in fairly rough form…'.

As in using their own prior work, expert designers may be initially Contextualizing via the prior work of others leading to simultaneously Trajectorizing and Attenuating (see 4.3) through the working over of new form Extract 14 (lines 125–131). Here the participant alludes to the ongoing shaping of initial form (Precedent Constructing) and the checking of form (Attenuating, see 4.3) via printouts:

{Testing}{Working_Phase}{PrimaryGen}
{Tech_as_tool}{Ref_Other_prior}
Extract 14 (RN_2, lines 125–126)

> '…I tend to print out copiously amounts of (laughs) characters and often just the individual character I'm working on…'.

In weighing up the net purpose of the working over of form and the checking of iterations of a new design:

{Testing}{Working_Phase}{PrimaryGen}
{Tech_as_tool}{Ref_Other_prior}
Extract 14 (RN_2, lines 130–131)

> '…to see how well the weights are working with contrasts between thicks and thins and so on…',

designers are simultaneously Trajectorizing and Attenuating (see 4.3). Thus ensuring specific aspects of newly Constructed Precedents adhere to their vision for the new design: '…contrasts between thicks and thins…', being elemental to the form of characters throughout the typeface design. Establishing relationship between such given aspects is important at this early stage in the design process. These kinds of micro detail become Constructed Precedents within the initially established characters of the newly developing typeface design.

Extract 14

RN_2 {Testing}{Working_Phase}{PrimaryGen}{Tech_as_tool}{Ref_Other_prior}	
119	RN: yes yes I mean I might I might draw in illustrator perhaps to begin with eh
120	a few shapes and then take those into fontlab and erm or I mean if it's if it's
121	something that's sort of derivative or at least if it's if it's a sort of sans
122	serif style I might start with you know having something in the background in in
123	fontstudio erm and then just work over erm making the modifications I think
124	appropriate as I go erm and often sort of in fairly rough form this is why I was
125	saying earlier that I tend to print out copiously amounts of (laughs) characters
126	and often just the individual character I'm working on erm so I might do a rough
127	shape and then just print it out at the sort of size erm + well usually I I would
128	start probably printing it at at around about a hundred and twenty point or
129	something like that to get a look at the basic shape eh erm and then some smaller
130	sizes to see how well the weights are working with contrasts between thicks and
131	thins and so on

Developing familiarity of a selected precedent other than those of the participant's own previous work constitutes a valid form of Contextualizing. In such instances experts may go beyond merely using existing design as a precedent upon which to base new design, but deliberately select precedents

purposefully to develop further understanding:

{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase}
Extract 15 (MC_1 lines 119–121)

> '…lets say that I did that I do have particular specimen of a typeface let's say that I would like that interests me that I want to inform myself about … I would begin by following it fairly literally…',

and

{PrimaryGen}{Ref_Other_prior}{DesignSpaceID}{Ref_Act_Design_learn}
Extract 16 (MC_1 line 83)

> '…that is how I educate myself about something…',

also

{PrimaryGen}{DefDesSearch}{Ref_Act_Design_learn}{Ref_Other_prior}
Extract 17 (MC_1 lines 91–92)

> '…it almost ends for me with an attempt to educate myself …'.

Experts learn from the use of precedents how knowledge of existing design may benefit in Trajectorizing a new text typeface design. Expert designers develop their own vision or foresight as to how a new text typeface design might develop (also see Envisioning in Attenuating 4.3):

{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase}
Extract 15 (MC_1 lines 124–128)

> '…you look at what you've done you compare it back to the model and I think it's almost never happened to me … that I have stayed with you know that I've sort of imported a historical typeface literally letter for letter stroke for stroke and so on perhaps arrogantly I generally find someway in which I want to change it…'.

As with working from their own previous designs to develop new design, experts use precedents to enable the generation of new design through familiarity with found or selected precedents. Developing familiarity with a design then allows designers to work over, compare and work away from the selected precedent in some way. This then introduces purposeful direction and originality in Trajectorizing the new design whilst still maintaining a sense of orientation and continuity upon which the new design is based:

{Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior}{Proced_Dev}{PrimaryGen}{Working_Phase}
Extract 15 (MC_1, lines 133–139)

> '…I would start by following the model fairly closely but then as I got more familiar with it more comfortable with it I probably would start to … I have a sense of responsibility toward historical models I don't want to … you know trash them … but on the other hand I … don't feel pious about it in the sense that I allow myself the … license … to make changes if I think they are … worth doing and so on you know…'.

Extract 15

	MC_1 {Mutability}{FirstChars_Uc}{FirstChars_lc}{Comparison}{Ref_Other_prior} {Proced_Dev}{PrimaryGen}{Working_Phase}
119	MC: I mean I'm + I lets say that I did that I do have particular specimen of a
120	typeface let's say that I would like that interests me that I want to inform
121	myself about erm I would begin by following it fairly literally probably you know
122	I would scan whatever eh sample I had I would work over it in eh I I generally
123	use fontographer different I've used different versions of it eh and and then of
124	course you you look at what you've done you compare it back to the model and I
125	think it's almost never happened to me as I as I said that I have stayed with
126	you know that I've sort of imported a historical typeface literally letter for
127	letter stroke for stroke and so on perhaps arrogantly I generally find someway
128	in which I want to change it erm + in the case of galliard you know I I've
129	described that as being an anthology of granjean's work because I've looked at
130	several different granjean faces and I've taken one bit from here and one bit
131	from there and so on you know erm and and and put them together in a in a
132	configuration that that granjean did not eh for the sake of argument so and
133	that's very unpredictable in my case I mean what as I say I I I would start by
134	following the model fairly closely but then as I got more familiar with it more
135	comfortable with it I probably would start to + I mean I + I have a sense that +
136	em + I have a sense of responsibility toward historical models I don't want to +
137	eh erm you know trash them erm but on the other hand I I don't feel pious about it
138	in the sense that I allow myself the the license to to make changes if I think
139	they are worth worth doing and so on you know

Extract 16

	MC_1 {PrimaryGen}{Ref_Other_prior}{DesignSpaceID}{Ref_Act_Design_learn}
83	MC: I mean that that is how I educate myself about something you know here's a
84	nice typeface I've got a reasonably good specimen of perhaps most of the
85	alphabet and so on let me scan it and put it in the background and eh and work
86	over it and see where it takes me

Extract 17

	MC_1 {PrimaryGen}{DefDesSearch}{Ref_Act_Design_learn}{Ref_Other_prior}
88	MC: and in that way eh I do sort of figure out why it is I like this typeface
89	(laughs) eh and indeed whether I want to pursue it you know whether whether I
90	think there's something here that I can use or add to or what whatever you like
91	you know but but erm yeah I it it it almost ends for me with an attempt to
92	educate myself about about something I'm attracted to eh without as I say
93	without necessarily having a very well thought out rationale for for liking this
94	or you know you know

The nature by which text typeface designers may be Contextualizing by means of found or selected precedents, other than that of their own work in order to develop Constructed Precedents, can vary from directly drawing over an initial found or selected source. The data evidenced alternative

instances whereby experts describe a purposeful selection and use of precedents as starting points for new designs. In these cases the method of engagement with background precedents used to work from varies from those mention previously. Negotiating familiarized aspects of precedent within developing new or original form can result from immersion of studying the form of the selected precedent(s). This can then lead to Precedent Constructing based upon memory of the initial precedent, even when this begins with a temporal approach to understanding the nature of the selected precedent(s):

{DesDelimiters}{FromKnowledge}
{Ref_Conv_Spec}{Ref_Know_Hist_Cont}
{Ref_Originality}{Ref_Other_prior}
{PrimaryGen}
Extract 18 (ES_1 lines 376–378)

> '…I might even trace some to get the gist of it that's how we all start and it is still a good method to trace that old stuff to get the feel of it … and then I would go put all the books away…'.

The use of selected precedents are as purposeful influences studied in order to develop familiarity and knowledge of form before embarking on the development of new form for text typeface design. This method of employing memorized precedents ensures newly Constructed Precedents vary or differ from that of the original precedent:

{DesDelimiters}{FromKnowledge}
{Ref_Conv_Spec}{Ref_Know_Hist_Cont}
{Ref_Originality}{Ref_Other_prior}
{PrimaryGen}
Extract 18 (ES_1 lines 365–369)

> '…I knew I wanted to go sort of like where syntax is but different … if you look at a typeface for a long time you study it as it were you know look in different size look at the drawings may be … then you sort of put the book away as it were and draw it from memory … it won't look anything like the original…'.

In terms of Contextualizing from memory and in relation to Precedent Constructing, the fact that the initial precedent is not temporal, tangible or present to the designer may have benefits. In employing such a method, the designer is not forced to concentrate on literal minutiae and detail, but this offers opportunity to develop Constructed Precedent(s) for the new design via developing detail(s) in relation to a conceptual or envisioned typology:

{DesDelimiters}{FromKnowledge}
{Ref_Conv_Spec}{Ref_Know_Hist_Cont}
{Ref_Originality}{Ref_Other_prior}
{PrimaryGen}
Extract 18 (ES_1 lines 383–385)

> '…I have soaked up and I find that actually a good and legitimate method because we are talking about a generic style…'.

In the use of memorized precedents, the designer is forced to work away from the initiating precedent(s) from inception as there remains no tangible or temporal precedent other than those that the designer begins to develop in term of Precedent Constructing:

{DesDelimiters}{FromKnowledge}
{Ref_Conv_Spec}{Ref_Know_Hist_Cont}
{Ref_Originality}{Ref_Other_prior}
{PrimaryGen}
Extract 18 (ES_1, lines 387–392)

> '…I would look at all the variations and then shut them away and … have a white sheet of paper and draw it … construct it I do start with a few measurements I want my thickness and stuff and my x-height an draw a little grid … and then just start drawing and drawing and drawing and then see what happens and I would I find that for me it's the appropriate way to do it…'.

In this example the initial precedent(s) upon which the Constructed Precedent(s) develop are not present to the designer in a temporal sense but are known or are afforded a mental image from which to develop new form(s) as a Trajectorizing action.

Extract 18

	ES_1 {DesDelimiters}{FromKnowledge}{Ref_Conv_Spec}{Ref_Know_Hist_Cont} {Ref_Originality}{Ref_Other_prior}{PrimaryGen}
360	ES: where was I I was going to say something else that's informative we were
361	there what was the other method + oh yes now that's one thing I noticed and I
362	didn't know that before erm I found out recently + I can't remember what I was
363	doing erm I said I won't use somebody else's outlines physically but what I do
364	like what we all do I am of course informed by what's out there so what I've
365	I've noticed I've been doing if I wanted a certain style like I said I knew I
366	wanted to go sort of like where syntax is but different + if you erm if you look
367	at a typeface for a long time you study it as it were you know look in different
368	size look at the drawings may be and erm and then you sort of put the book away
369	as it were and draw it from memory + it won't look anything like the original
370	MH: no no
371	ES: but it will be what you remember about it then it's yours so it's
372	appropriation like we all do it's eh to me that's legitimate so if I drew a
373	Garamond I would probably spend you know a few weeks looking at Garamonds and I
374	would put all the Garamonds away not trace them
375	MH: Hm hm
376	ES: I might even trace some to get the gist of it that's how we all start and
377	it is still a good method to trace that old stuff to get the feel of it erm + and
378	then I would go put all the books away sit down and say OK what what does
379	Garamond look like and I would draw and it wouldn't look anything like Garamond
380	it would have some of the drops of Garamond has the contrast may be but it would
381	be mine
382	MH: so are you remembering the things from the different versions of Garamond
383	ES: yeah whatever whatever is whatever I have soaked up and I find that
384	actually a good and legitimate method because we are talking about a generic
385	style you know if I wanted to do a Bodoni or whatever or a modern or something
386	more general or a constructed sans which I haven't done yet erm I would probably
387	do it the same way I would look at all the stuff you know I would look at all
388	the variations and then shut them away and and have a white sheet of paper and
389	draw it + construct it I do start with a few measurements I want my thickness
390	and stuff and my x-height and draw a little grid + and then just start drawing
391	and drawing and drawing and then see what happens and I would I find that for me
392	it's the appropriate way to do it

Precedent Constructing then is manifest within the process of design in the initial stages of developing form for text types. This allows the designer to envision further potential development of design to the point where the design will eventually become self-informing. As an element of the initial Trajectorizing actions, the designer is able to focus more clearly the potential within the newly developing design as informing its own further development as a series of forms. The point where the Constructed Precedent becomes set, fixed or actuated, is when the designer stops working over the form, either temporarily or permanently in the process of design. The newly Constructed Precedent then has the potential to become an Endogenous Generator (see Homologizing 4.2) within the process of text typeface design. The designer may then move from initial Trajectorizing actions to Homologizing (4.2) actions within the process of text typeface design. The core category Homologizing is described in section 4.2 along with its related conditional sub-category Endogenous Generaton.

4.1.4.3 Control Characters and Constructed Precedents

It is important to mention at this particular point within this developing Grounded Theory, that one of the main aspects of the design decision-making process that links and allows the designer to move from Trajectorizing actions to Homologizing actions within the process of text typeface design (and relative to this developing theory) is in the selection of first character forms to work upon. That is to say the first letterforms the designer selects or chooses to develop as design. The term often used by designers for initial letterforms designed for a typeface is 'control characters', this term is referred to at times by the participants within the primary research data. Constructed Precedent refers to letterforms or parts thereof selected by the designer and as described in the data by the participants that are the first characters indicated whereby an attempt proper is made to begin to develop letterforms for the typeface. Therefore, the term Constructed Precedent refers to the initial actuated letterforms and parts thereof beyond any initial sketches in sketchbooks or notebooks etc. that may relate to idea

generation or delimitation etc. of concepts formulated prior to the attempted articulation of design.

In general terms, when experts describe the first characters they design, the designing of these characters can be seen as often purposefully generative, in that they allow for the development of others to follow. That is to say that these Constructed Precedents are not solely designed as an end in themselves, but that these elements open up possibilities and means for further procedural development of the typeface design also. Initial letterforms designed within the early stages of the process of text typeface design are more than merely used as control characters, they are also generative characters who's component parts act as precedent for subsequent characters to draw from. Text typeface designers then are Trajectorizing in their choice of which initial characters or letterforms to work on in the early stages of the design process. Participants evidenced not only the kinds of characters or letterforms upon which the design begins but also the significance in relation to these choices.

Extract 19, line 318 and Extract 24, line 158 illustrate type design experts identifying the first characters that they begin the design process with. It can be noted that there are commonalities and differences between the suggested starting points evidenced by experts:

{FirstChars_lc}
{Ref_Other_prior_NEG}
Extract 19 (JFP_1, Line 318)

'…probably my first are n p…',

whereas:

{FirstChars_lc}{Proced_Dev}
{Des_Micro}{SystemNotion}
{Proced_Dev}{Des_Micro}
Extract 20 (GU_1, line 158)

'…I start with an h and an o or an n and an o…',

the characters common between the expert accounts above is the 'n'. Experts purposefully select the nature of these starting points:

{FirstChars_lc}{Proced_Dev}
{Des_Micro}{SystemNotion}
{Proced_Dev}{Des_Micro}
Extract 20, (GU_1, lines 158–159)

' …and from there pull through other characters …'.

Trajectorizing design in such a manner not only initiates a general process of design, it also loads those initially designed elements with potential to inform subsequent elements within a design – Precedent Constructing. The consequential Constructed Precedents lead to opportunity for Homologizing (see 4.2) actions with the process of design. Type design experts describe drawing from declarative knowledge, knowing that certain

choices as to which character to begin with will allow for trajectory to develop in the system of design. Here it is not just the choice of 'what' character that can be seen as important, but 'why' it is important as this choice is both purposeful and generative at the same time. Trajectorizing therefore purposefully initiates design but also predicates design. In the case of text typeface design, the action of developing subsequent characters in relation to Constructed Precedents belongs to the core category of Homologizing (4.2). Thus Constructed Precedents establish the direction and inform the development of the text typeface design:

{FirstChars_lc}{Proced_Dev}
{Des_Micro}{SystemNotion}
{Proced_Dev}{Des_Micro}
Extract 20 (GU_1 lines, 164–165)

> '… basically it's true … so you start indeed with a very limited set and build from there'.

Extract 19

JFP_1	**{FirstChars_lc}{Ref_Other_prior_NEG}**
312	JFP: so, so, so for the initial glyph we are always
313	question + it came always on the table + erm + and I know
314	depending on the designer there is different glyph I know
315	that Frutiger use + o n + but eh the o is probably one of
316	the last letter I will design
317	MH: Yeah
318	JFP: but the n probably my first are n p

Extract 20

GU_1	**{FirstChars_lc}{Proced_Dev}{Des_Micro}{SystemNotion}{Proced_Dev}{Des_Micro}**
155	GU: [gazes upwardly shaking head slightly] it's again
156	something that I do not pay a lot of attention to + I think
157	there is there is a bit of variation there + like Matthew
158	[Carter] I start with an h and an o or an n and an o and
159	from there pull through other characters + Matthew [Carter]
160	says the the genetic information for the font is in the h
161	and the o + [screws face slightly] I'm inclined to say there
162	should be a few more characters like lowercase a or
163	lowercase s and eh the tail of a g and a few more details
164	like that but + eh basically it's true + so you start indeed
165	with a very limited set and build from there

The choice of 'control characters' that designers select to work upon in the initial stages of the text typeface design are important as they facilitate the ability for designers to negotiate the move from Trajectorizing actions to Homologizing (see 4.2) actions via Constructed Precedents within the

early stages of the typeface design. This also allows the designer to move from working at a micro level of detail in terms of specifics in relation to single character design to common attributes in terms of a general developing view of the typeface design at a macro level. The core category Homologizing and its related phenomena are detailed below in section 4.2.

4.1.5 Summary – Trajectorizing

The core category Trajectorizing describes then the way in which designers make decisions and their related actions that inform and influence initial aspects of the design process. This includes character designs and the development of these designs relative to the process of the overall emerging design of the text typeface. Trajectorizing describes the impact and consequences in terms of decision-making and designing form and/or forms of initial characters within the process of text typeface design. Trajectorizing as a core category also includes the developed sub-categories Contextualizing, Precedent Constructing and Constructed Precedent, these latter sub-categories describe conditional, causal and consequential phenomena respectively, relative to the causal core category Trajectorizing.

The category Trajectorizing describes causal phenomena that afford the typeface design expert a sense of orientation, location or perspective within the design process. The sub-category Contextualizing describes possible singular or multivariate precedent-like influences that are drawn from in order to establish or influence the process of design. Certain Contextualizing influences can be seen as similar to such influences as the clearly identified 'Primary Generator' (Darke 1979). Conversely, such Contextualizing influences may also appear accounted for as more complex multivariate or blended forms of precedent-like influence. Such references with respect to the category Trajectorizing may be directly drawn from the type design expert's knowledge and experience or from extant exemplars of designs, schema, taxonomies or methodologies. Precedent-like influences can include the work of other designers but may solely be contained to the typeface design expert's own prior work. In part, Trajectorizing describes the way in which designers draw upon declarative knowledge or that which is

known, and how this allows for fixed points of reference and verification to negotiate location and perspective, Contextualizing the initial stages of text typeface design. Contextualizing affords the designer to aim at with purposeful potential. In relation to Trajectorizing, the sub-category Precedent Constructing describes causal phenomena relative to the way in which designers form in the initial stages of design by way of developing Constructed Precedents that will subsequently inform the developing design – Precedent Constructing. Here designers generate initial form(s) in order to that such new form will allow subsequent form to develop f rom this.

The core category Trajectorizing describes a set of actions and decisions that belong to the initial stages of developing form, in the instance of this research – letterform or parts thereof. Trajectorizing also refers to the function of potential that the designer purposefully develops within the initial forms of design. In this respect, as well as initiating the design of the text typeface, the action of Trajectorizing allows the designer to calibrate, aim and charge with potential the direction and way forward of subsequent form within the system of the typeface design. The potential loaded within initial designed elements – letterforms or parts thereof – subsequently allows for Homologizing actions that in turn further develop the overall text typeface design.

4.2 Processes of text typeface design: Homologizing

Contents

4.2 Homologizing

4.2.1 Introduction

This section outlines the developed core category **Homologizing** and its related sub-categories **Endogenous Generation** (including its dimensions **Homologous Mapping** and **Homologous Drift**) and **Endogenous Generator**. Included also in this section are the developed dimensions **Synthetic Acquiescence** and **Synthetic Displacement**. The latter sub-category dimensions are aligned with known causal phenomena Extrapolation and Interpolation that are identified within this research as sub-categories of Homologizing. As in the sections 4.1 and 4.3, the relationship of core category and relative sub-categories is highlighted with reference to Glaser's theoretical familial categories – the Six Cs (Glaser 1968). Table 4.2.1.1 shows the relationship of Homologizing and its sub-categories aligned to Causal, Conditional, Consequential and Contingent categorizations, these relationships will be described further within this section below.

Core Category	Sub-Categories		
Causal	Causal	Conditional	Contingent
Homologizing		**Endogenous Generation** Homologous Mapping (dimension) Homologous Drift (dimension)	**Endogenous Generator**
	Extrapolation* ***Interpolation**** Synthetic Acquiescence (dimension) Synthetic Displacement (dimension)		

Table 4.2.1.1
Relationship of the core category *Homologizing* to sub-categories.
NB. Known causal phenomena is marked [†].

In this section and the preceding and subsequent sections 4.1 and 4.3, the raised core and sub-categories are developed as Grounded Theory as described in the introduction to this chapter 4.0. Table 4.2.1.2 shows the relationship of the core category Homologizing and its developed sub-categories: **Endogenous Generation** and Endogenous Generator along with sub-category dimensions and known causal phenomena here referenced

to as sub-categories of the core category Homologizing. This table also shows the relationship of sub-categories to the substantive coding and coding descriptions relative to coding at the primary data level. This makes explicit the hierarchical lineage of the raised conceptual categories relative to coding at the data level. As will be found in sections 4.1 and 4.3, extracts from the primary data will be used to illustrate and evidence developed theoretical concepts and assertions.

Homologizing – Codes relating to core category

Sub Cat > Code	Definition
***Endogenous Generation** + [Homologous Mapping – Homologous Drift] (Dimensions) + Endogenous Generator (Contingent)*	
Des Macro	Participant describes/acknowledges details relating to a macro level view/notion of design
Des Micro	Participant describes/acknowledges details relating to a micro level view/notion of design
FirstChars Uc	Participant describes Letters designed initially for the UPPERCASE
FirstChars lc	Participant describes Letters designed initially for the lowercase.
Mutability	Participant describes mutable differences in similar character shapes
Proced Dev	Participant's Statement shows insight to procedural development of design
SystemNotion	Participant describes or intimates NOTION of, or reference to a SYSTEM or framework
Tech as tool	*Participant describes using technology as a tool in the process or generation of design*
***Extrapolation/Interpolation**† + [Synthetic Acquiescence – Synthetic Displacement] (Dimensions)*	
Des Macro	Participant describes/acknowledges details relating to a macro level view/notion of design
Des Micro	Participant describes/acknowledges details relating to a micro level view/notion of design
FirstChars Uc	Participant describes Letters designed initially for the UPPERCASE
FirstChars lc	Participant describes Letters designed initially for the lowercase.
Mutability	Participant describes mutable differences in similar character shapes
Proced Dev	Participant's Statement shows insight to procedural development of design
SystemNotion	Participant describes or intimates NOTION of, or reference to a SYSTEM or framework
Tech as tool	*Participant describes using technology as a tool in the process or generation of design*
Variants	*Participant describes consideration of other design variants in the design process*

Table 4.2.1.2
Table showing lineage and relationships of coding at the substantive level up through conceptual categories with reference to the core category. NB. Known causal phenomena is marked †.

4.2.2 Homologizing

Where Trajectorizing describes the actions of text typeface designers in relation to the initial development of form within the process of design, Homologizing describes actions relating to developing relational contiguity within the emerging forms relative to new a text typeface design.

As mentioned in section 4.1.4.3, designers' Trajectorizing actions initiate the designing of particular type-forms early in the process of design. The letterforms produced by designers at this early point in the process are not solely for the purpose of designing those letterforms in themselves. That is to say that type designers are not merely designing collections of individual letterforms that become typefaces. Designers are designing or shaping letterforms in order that qualities of the designed forms, or more correctly, elements of the designed forms – Constructed Precedents – will potentially inform the development of other subsequent letterforms within the developing typeface.

Within the design process designers are producing initial forms that help shape or generate subsequent forms by way of their elemental parts, proportions, spacing and modulation of stroke etc. Propagation of form develops from an initial character(s) or initial group of forms. Subsequent forms become homologues or Homologizing forms. Homologizing provides the basis upon which the whole typeface develops its internal relational harmony. As a typeface develops and continues, even through to the latter stages, designers may change or adjust characters. Adjustment and/or alteration may have an impact or knock-on effect throughout the rest of the design. If the designer changes one aspect of a single letter, this may have the effect of necessitating change in other letters or all letters in the design. Homologizing ceases when relational changes to form are deemed no longer necessary or required.

4.2.2.1 Endogenous Generation and Endogenous Generator

Endogenous Generation sees the designer involved in the act of creating homologues based upon form that has been created prior within the process

of design. In order for designers to produce homologous form, a previous Constructed Precedent(s) is utilized in an act of Homologizing. Previous trajectorized form(s) when utilized become reference points or starting points in order to develop emerging relational form within the text typeface design process. In this act, designers develop the typeface from micro to macro levels of familial contiguity, this can be at the character or family level (eg. bold etc.).

Conditional to the core category Homologizing is the act of Endogenous Generation. As designers generate subsequent form based upon prior form, produced within the initial stages of the process, the prior form when utilized becomes the contingent Endogenous Generator. Designers move beyond laying down rule and principle in the form of initial Constructed Precedent, to actively using these forms as generators for new form. The switch from Constructed Precedent to Endogenous Generator initially sees the designer producing new form – Trajectorizing new material ahead, once this is fixed, it has the potential to inform further design, relative to this. The form switches from precedent that has been laid down with potential to inform, to active internal generator within the process of design – Endogenous Generator. The act of Endogenous Generation then, requires a contingent Endogenous Generator in the process of producing homologous form.

The Endogenous Generator is then a Constructed Precedent or group of precedents that the design expert utilizes in order to produce further relational form, thus enabling further development of the typeface design. Furthermore, all forms once generated within a typeface design have the potential to become Endogenous Generator(s), whether produced initially via Trajectorizing actions or subsequently via Homologizing actions in the process of design. The Endogenous Generator is therefore identified as contingent to the conditional phenomena Endogenous Generation that manifests as a result of the designer's Homologizing actions with respect to developing relational form throughout the process of text typeface design.

4.2.2.2 Homologizing – procedural development and mutability

Type design experts knowingly predict and progress the design process through a series of events identified in this research as Homologizing actions. Expert designers trajectorize control characters (see section 4.1.4.3) to produce as a deterministic and purposeful choice in beginning a text typeface design. Initial control characters are by their nature loaded with vestigial Constructed Precedents. Homologizing was initially identified where type design experts accounted for developing relational form within the type design process that emanated from prior trajectorized forms. The type design expert's deterministic choice of Trajectorizing control characters not only allows the type design process to begin in terms of design that is manifest, this also allows for potential subsequent development of design via Constructed Precedents. These if utilized, become active Endogenous Generators:

{Proced_Dev}{DesignSpaceID}
{Letter_parts}{FirstChars_lc}
{FromKnowledge}{Mutability}
Extract 21 (JFP_1, lines 325–327)

> '… because the 'n' is the basis of the most biggest group of letters … you have the 'm' you have the 'u'…'.

Type design experts produce homologues in relation to initially developed characters through recognition and exploitation of usefulness in the details of form – Constructed Precedents (section 4.1). Homologizing describes the specific ways that designers propagate form through to other letterforms as a text typeface develops. This may be derived from whole or constituent parts of initially designed letterforms:

{Proced_Dev}{DesignSpaceID}
{Letter_parts}{FirstChars_lc}
{FromKnowledge}{Mutability}
Extract 21 (JFP_1 lines 329–331)

> '…you have the way you have the stem with the curve on this part on top or sometime on the bottom … you connect to a curve you connect to a stem it's something that is everywhere on the typeface…'.

However, certain characters or specific attributes of characters are beneficial in establishing early in the process. These will allow for a greater yield or influence in terms of developing homologous form through the typeface design from the elemental detail level of pattern identified and that such details are translatable from the trajectorized control characters:

{Proced_Dev}{DesDelimiters}
{Letter_parts}{FirstChars_lc}
{SystemNotion}{Mutability}
Extract 22 (JFP_1 lines 354–363)

> '…there is many thing just on this connection … give a lot of answer for the rest of the typeface … and the serif indeed … there is a relationship with thickness … there is a lot of things just there on this part … on the stem with the connection here … it is really … the … heart of the typeface certainly…'.

Extract 21

JFP_1	**{Proced_Dev}{DesignSpaceID}{Letter_parts}{FirstChars_lc}{FromKnowledge}{Mutability}**
322	MH: and are you + so you are talking about the n and the p
323	JFP: yes + because
324	MH: they are becoming useful for what reasons?
325	JFP: for for for everything + because the n is the basis
326	of the most bigger group of letters + you have the m you
327	have the u + you have the way that you have the stem with
328	curve [gestures with hands to form an upright motion and a
329	connected curve motion] on this part on the top or sometime
330	on the bottom + you connect to a curve you connect to a stem
331	its something that is everywhere on the typeface + on the
332	bottom of the a on the a on the a lowercase [gestures again
333	to form the shape of a lowercase a] you have the a is there
334	[gesture to form the curve at the bottom of the lowercase a]
335	so is as the same things as on the u or on the top of of the
336	n so + this is a crucial decision

Extract 22

JFP_1	**{Proced_Dev}{DesDelimiters}{Letter_parts}{FirstChars_lc}{SystemNotion}{Mutability}**
353	JFP: it will
354	change also the type + there is many thing on this just
355	just this this connection + [continually gesturing with hands
356	to make the shape or the connection of stem and curve]
357	this connection + eh + give a lot of answer for the rest of
358	the typeface + and the serif indeed + there is a
359	relationship with the thickness + eh + there is a lot of
360	things there just on this part + on the stem with the
361	connection here [clearly and purposefully gestures the form
362	of a stem and connection] + just this part + it is really em
363	+ the + the + heart of the typeface certainly

The above example illustrates the type design expert's ability to identify and act upon their knowledge in terms of how an aspect of a trajectorized form – Constructed Precedent (in this instance the connection between an upright stem and the curve or shoulder of a lowercase n) – will inform other aspects of the typeface design. Concatenated elements or steps within the development of design would therefore be informed by the detail within a trajectorized control character, in this example the connection of curve and stem in the lowercase n. In developing other characters in the design the trajectorized 'n' becomes an Endogenous Generator as it informs subsequent characters whereby a similar connection between stem and

curve is determined apposite. Mutability in relation to how the identified detail works and how this is applied or adapted to other elements within the system of design becomes part of the designer's Homologizing actions.

All participants in this research described working in similar ways – from initially Trajectorizing particular and specific characters with their Constructed Precedents, to developing other forms by means of Homologizing via Endogenous Generators. Commonly, expert designers begin with lowercase characters amongst which the lowercase n appears to be favoured frequently within initiating the text typeface design. Extract 27 (MM_1, lines 36–40) evidences the way in which a Trajectorizing control character becomes an Endogenous Generator – the lowercase n – in the way that it informs the development of a series of related letterforms through the designer's Homologizing actions. This also makes clear that the expert in the subject area of text typeface design – is able to project forward in terms of how the selection of a particular character – the lowercase n – will allow for procedural development within the typeface design:

{Proced_Dev}{Mutability}
{Letter_parts}{FirstChars_lc}
Extract 23 (MM_1 lines 38–40)

'…so already with one letter you have like maybe … six or seven letters … so fairly fast you can make an idea of what you want…'.

Extract 23

MM_1 {Proced_Dev}{Mutability}{Letter_parts}{FirstChars_lc}	
36	if you have for example the letter n + you
37	just turn it around you have you have the u + or you turn it back around and you
38	attach eh an ascender + you have the h or a double n is an m so already with one
39	letter you have like maybe + [shakes head slightly] six or seven letters + so
40	fairly fast you can make an idea of what you want

An Endogenous Generator may inform more than a single aspect of a letterform. Attention to detail in the design of Trajectorizing control characters plays an important role in terms of how these details will have the potential to inform subsequent characters within the developing typeface design. Experts identify the importance in the relationship of the Homologizing of curves:

{Letter_parts}{Working_Phase}{SystemNotion}{Proced_Dev}{Mutability}{FirstChars_lc}{DesignSpaceID} Extract 24 (RN_1 lines 126–128)

'…characters such as lowercase n is … obviously a shape that is replicated in a number of other characters the m the h the u so it's important to establish … that shape and it's relationship to the other curves…'.

It is important to note that this does not imply a simple repetition of form but talks about 'relationship' in terms of the curve of one letterform against a series of others. Homologizing implies the importance of mutability in the procedural development of form:

{Letter_parts}{Working_Phase}{SystemNotion}{Proced_Dev}{Mutability}{FirstChars_lc}{DesignSpaceID} Extract 24 (RN_1 line 128)

'relationship to the other curves…'.

The specific concentration on form at an elemental level with respect to Trajectorizing Constructed Precedents is also evidenced. Experts describe the importance of particular details within the relationships of forms as potential Homologizing details:

{Letter_parts}{Working_Phase}{SystemNotion}{Proced_Dev}{Mutability}{FirstChars_lc}{DesignSpaceID} Extract 24 (RN_1 lines 131–134)

'…it's obviously important to get the serif shapes right and look at the different styles of … serif like the beak serif like you get on the top of an n or an i … in relation to the baseline serifs…'.

Here the participant not only describes the different types of serif that have a different purpose and function 'beak serif' and 'baseline serifs', but also that there is a relationship relative to the form of the different kinds of serif, '… get the serif shapes right and look at the different styles of … serif' and '…in relation to…'.

Extract 24

RN_1	**{Letter_parts}{Working_Phase}{SystemNotion}{Proced_Dev}{Mutability}{FirstChars_lc}{DesignSpaceID}**
126	erm characters such as lowercase n is is obviously a shape that is replicated in
127	a number of other characters the m the h the u so it's important to establish
128	that that shape and it's relationship to the other curves
129	MH: yeah
130	RN: you know the sort of curved part to the n (gestures with hands to form the
131	curve of the n) + erm also if it's a serifed typeface it's obviously important to
132	get the serif shapes right and look at the different styles of sheriff serif
133	like the beak serif like you get on the top of an n or an i erm eh in
134	relation to the baseline serifs

In order that a trajectorized control character becomes useful, in that it will allow for subsequent Endogenous Generation, the designer must be confident that enough attention has been given to the Trajectorizing characters in terms of specifics of detail of form – Constructed Precedents.

Such focus on detail at a micro level affords designers' Homologizing actions with respect to developing relational form within the text typeface design:

{SystemNotion}{Proced_Dev}{Mutability}{Letter_parts}{FirstChars_lc} Extract 25 (MC_1, lines 366–368)

> '…whatever little subset of the alphabet you've chosen to work with you think … has it you know embodies all of the important proportional dimensional aspects…'.

Experts are aware that such relationships between forms within the typeface design are not achieved merely mechanically as homogenised form (see also section 5.2.2), but that these relationships between form are developed over time and with care:

{SystemNotion}{Proced_Dev}{Mutability}{Letter_parts}{FirstChars_lc} Extract 25 (MC_1 lines 369–371)

> 'only when you get really pretty confident with that then do you start saying oh well I'll make an n now from the h or you know a d from the p or whatever'.

Experts also evidence where Homologizing relational development takes place within the process of design that does not take straightforward, obvious or superficial routes in terms of developing one form or set of forms in relation to another:

{SystemNotion}{Proced_Dev}{Mutability}{Letter_parts}{FirstChars_lc} Extract 25 (MC_1, lines 371–374)

> '… and go off and try … you know different categories of letters some of which may be don't have relatives within the alphabet and so on so there isn't an obvious sort of path … that you apply your decisions systematically…'.

Extract 25

MC_1 {SystemNotion}{Proced_Dev}{Mutability}{Letter_parts}{FirstChars_lc}	
366	and as you get more confident in whatever little subset of the alphabet you've
367	chosen to work with you think eh eh has it you know embodies all of the
368	important proportional dimensional aspects sort of thing all these things does
369	it have serifs or not all these details only when you get really pretty
370	confident with that then do you start saying oh well I'll make an n now from the
371	h or you know a d from the p or whatever it is eh and go off and try you know +
372	so you know different categories of letters some of which may be don't have
373	relatives within the alphabet and so on so there isn't an obvious sort of path
374	that you that you apply your decisions systematically and so on so you know you
375	you you build it eh you build it slowly

Beyond sets of letterforms that share common obvious attributes, such as a curve and a stem or a bowl and a stem etc. eg. n, h, m, u etc. or b, d, p, q etc. Homologizing develops relational form in groups of letters beyond where

there may appear to be obvious similarity:

{SystemNotion}{Proced_Dev}
{Mutability}{Letter_parts}{FirstChars_lc}
Extract 25 (MC_1 lines 373–375)

> '…isn't an obvious sort of path that you that you apply your decisions systematically … you build it … slowly'.

The designer then is using the specific selection of characters to influence the development of the design along certain routes until there is enough in terms of information in the developing letterforms that may then go on to inform in more subtle or less obvious ways.

4.2.2.3 Homologizing beyond obvious relational form

Expert type designers knowingly identify and act upon decisions that help to progress the type design beyond developing what can be considered groups of concatenated letterforms – for example: n, m, h, u and b, d, p, q etc. Although such groupings of letterforms will have subtle, mutable or nuanced attenuated (see 4.3) differences with respect to homologized form, there does appear a superficially obvious connection between such groups of letterforms. However, type design experts homologize form at less obvious, micro levels of detail, in order to progress their designs and establish harmonious relationships of form between characters across the type design at the macro level.

In order to develop such subtle relational balance between forms, the type design expert again knowingly draws from trajectorized, Constructed Precedents:

{FirstChars_lc}{Letter_parts}
Extract 26 (JFP_1, lines 403–406)

> '…I have the ascender with the l … I change to a letter that everybody look at into first … will be the e the a … eh can be the f eh can be after more difficult letter like the s…'.

Whereas in the development of grouped or related sets of letterforms, designers may utilize a whole character as an Endogenous Generator – for example the lowercase n – the micro detail level of the Constructed Precedent affords designers to develop relational form in the developing typeface design at more subtle levels:

{FirstChars_lc}{Letter_parts}
{SystemNotion}{Proced_Dev}
Extract 27 (JFP_1, lines 409–412)

> '…because that's the letter where you have the most of most of the style of the typeface … also because you have some basic elements basic shapes that it will repeat on every part of the typeface…'.

Type design experts move from obvious or explicit paths of **Homologizing** to less obvious, more nuanced forms of developing homology at detailed levels within the typeface:

{FirstChars_lc}{Letter_parts}
{SystemNotion}{Proced_Dev}
Extract 27 (JFP_1, lines 421–425)

> '…you will have that repeat on the top of the f so you have some of the elements that will repeat over the part of the typeface the top of the f will repeat somehow to the top of the c and the r lowercase and the and at the end of the y … and so with very few letter you have the full style of the typeface…'.

Extract 26

JFP_1	**{FirstChars_lc}{Letter_parts}**
403	JFP: I have the descender I have the ascender with the l + l
404	change to a letter that everybody look at into first + will
405	be the e the a + eh can be the f eh can be after more
406	difficult letter like the s

Extract 27

JFP_1	**{FirstChars_lc}{Letter_parts}{SystemNotion}{Proced_Dev}**
407	MH: hm hm + so why is something like the e and the a and
408	the
409	JFP: because that's the letter where you have the most of
410	most of the style of the typeface + also because you have
411	some basic elements basic shapes that it will repeat on
412	every part of the typeface + so you have the always the
413	serif on n and on p and if you jump to the e
414	+ you have the terminal and it's turn up not by a thick part
415	but by a thin part even if it's a sans serif it's will be a
416	little more thinner at the end but the top of the a is very
417	special it's just the a who have that in serif typeface but
418	in sans it's more something like to the e so this shape is
419	(unclear word) with the thicker parts because of the
420	calligraphy scriptures and you will have that repeat on the
421	top of the f so you have some of the elements that will
422	repeat over the part of the typeface the top of the f will
423	repeat somehow to the top of the c and the r lowercase and
424	the and at the end of the y + and and so with very few
425	letter you have the full style of the typeface

Type design experts homologize from Endogenous Generators in order to develop the typeface design beyond initial trajectorized forms. They also utilize micro-level Constructed Precedents to establish and develop homologous relationships of form across the entire typeface.

4.2.2.4 Homologizing – facilitating self-informing design

Homologizing within the developing design affords type design experts to purposefully abandon comparisons in terms of extraneous initial forms of influence and precedent. As Homologizing develops relational harmony between forms within a design, the use or need for an extraneous precedent to compare to or against becomes unnecessary or less desirable. Expert typeface designers develop a sense of identity or originality in their work via Homologizing actions:

{Ref_Originality}{DesignSpaceID}{DefDesSearch}{Proced_Dev}{PrimaryGen}{Comparison}
Extract 28 (RN_1, lines 275–277)

'…once I feel I've got a concept that's working then I'm happy to develop that then I don't need to keep comparing it to other things…'.

Via Homologizing, the type design expert is able to eventually develop the typeface as a self-informing design:

{Ref_Originality}{Proced_Dev}{PrimaryGen}{DesDelimiters}{Comparison}{Ref_Own_Prior}
Extract 29 (RN_2, lines 73–75)

'…once I'd sort of got the basic parameters … on Nimrod I was happy then to sort of develop it … within its own rights…'.

Extract 28

RN_1	**{Ref_Originality}{DesignSpaceID}{DefDesSearch}{Proced_Dev}{PrimaryGen}{Comparison}**
257	RN: well it certainly for me it's not off the top of my head erm I've always +
270	the the design work that I've been involved with is always sort of erm as far as
271	I'm concerned is developing typefaces from from what already exists but I think
272	once you get the initial concept fixed in your mind of what you what to try to
273	achieve anyway for me anyway I I tend then not not want to compare to other
274	things erm once I I suppose it's partly an experience thing you know I've worked
275	with type for forty plus years once I feel I've got a concept that's working
276	then I'm happy to develop that then I don't need to keep comparing it to other
277	things + erm but even so I I still see the sort of design work that I've done as
278	a sort of development process really

Extract 29

RN_2	**{Ref_Originality}{Proced_Dev}{PrimaryGen}{DesDelimiters}{Comparison}{Ref_Own_Prior}**
72	RN: erm but with say something like Nimrod erm although I wanted to see how it
73	compared to other newspaper faces of the time once I'd sort of got the basic
74	parameters set on on Nimrod I was happy then to sort of develop it to to you
75	know within it's own rights not not really because I wanted to improve on any
76	particular existing typeface

The link between the use of precedent, Trajectorizing and Homologizing actions and their function in the formation of a new design is highlighted in Extract 30. In terms of utilizing precedent, this highlights not only being of use to the participant to help begin a new design but evidences using a previously designed form as a gauge against which to develop a new design. In terms of Trajectorizing, here the precedent is described positively as something to work away from and that the reference can eventually be dropped after a period of time. Homologizing is evident in terms of the new typeface as becoming self-informing. Other Homologizing influences are also described by the participant in this particular example in terms of the serif structure and the notion of the italic form. These draw from knowledge of specific historical precedents alongside the precedent of the participant's prior work to form a multivariate mix of precedents that the participant describes as helping initiate the new typeface design. Once established within the new design, these influences become self-informing for the design:

{Ref_Originality}{Ref_Conv_Spec}{PrimaryGen}{Des_Micro}{Des_Macro}{Proced_Dev}{Comparison}{Ref_Other_prior}
Extract 30 (JT_1c, line 133)

> '…and eventually it becomes it's own thing…',

its references becoming internalized within the design:

{Ref_Originality}{Ref_Conv_Spec}{PrimaryGen}{Des_Micro}{Des_Macro}{Proced_Dev}{Comparison}{Ref_Other_prior}
Extract 30 (JT_1c, lines 135–137)

> '…like the a wants to be something different and it became something different any way as a matter of course and then it sits within its other letters within its grouping quite happily…'.

The type design expert also gives consideration to the levels of similarity and mutability of form in order that a character should 'sit' well within the context of other developing forms.

Extract 30

JT_1c {Ref_Originality}{Ref_Conv_Spec}{PrimaryGen}{Des_Micro}{Des_Macro} {Proced_Dev}{Comparison}{Ref_Other_prior}

JT: well when I use my own work it's not sometimes it's not so I'm not sort of + I'm aware that I don't want to produce something or because the computer can make you do lazy things I don't want to end up with like an easy option or an easy solution erm + eh + eh yeah there's lot's of sort of erm baggage well one thing with Kingfisher against Enigma was I didn't want to fall in to the trap of it looking like Enigma I wanted to avoid that and become it's own thing which it did do over time but the early stages if you spend a lot of time doing something then it's time wasted because it's sort of oh well that's not what I wanted to do whereas if it's visually in front of me all the time then I can say that well that's the pattern that Enigma gives me and this is what Kingfisher is becoming and eventually it becomes it's own thing then I can drop that reference not so much a reference just something I'm aware of I don't want it to be that so I don't to have like the a wants to be something different and it became something different any way as a matter of course and then it sits within its other letters within its grouping quite happily erm the reference to Fournier was I wanted that erm for the serif structure I wanted that erm sort of flat erm eh the the the y'know eh what do you call it the erm the the sort of the slab bottom serif with the more traditional erm old styley kind of top to it so you've got this oddity happening which you you don't really you you yeah you do get occasionally but then you get a bit more swelling in the bottom of serif I wanted to keep it a bit sort of starker and it he it was seen as revolutionary when he did it and his italic was an odd thing even though it was a sloped roman supposedly it doesn't look like a sloped roman to us but that those kind of ideas sort of were in built into Kingfisher or started me off on what it became

4.2.2.5 Homologous Mapping and Homologous Drift

The dimensions Homologous Mapping and Homologous Drift account for the considerations expert type designers exercise when creating homologues via Endogenous Generation in order that contextual fit with respect to relationships of form are satisfied. In creating homologues, expert designers must consider how closely to adhere to precedent already constructed within the existing forms of the developing typeface. If the prior Constructed Precedent is adhered to rigidly, then a close Homologous Mapping of form takes place. If degrees of nuance and mutability of form are required in order that the new form not only takes its own shape, but also contextually fits well with existing form, then the designer exercises a degree of Homologous Drift in relation to the prior form of the Constructed Precedent. However, if the designer is unable to attain an agreeable contextual fit in the new form with existing form via the dimensions of Endogenous Generation, Homologizing form may be

abandoned in order that a newly trajectorized form is pursued. Extract 31 illustrates the kinds of decisions and judgments made by the expert text typeface designer in developing relational or familial context between forms. Here the participant describes the possible considerations of developing a lowercase p and using the lowercase n as a basis to work from. The lowercase n in this case becomes the Endogenous Generator, as it is the existing form, the lowercase p the developing form:

{PrimaryGen}{Proced_Dev}
{Letter_parts}{Mutability}{FirstChars_lc}
Extract 31 (JT_2c, lines 327–328)

'…I will sort of place it on top of the n and see if it's the same…'

The lowercase n is set with its component Constructed Precedents:

{PrimaryGen}{Proced_Dev}
{Letter_parts}{Mutability}{FirstChars_lc}
Extract 31 (JT_2c, lines 329–331)

'…the form is different you know well the n goes round and then goes down to a straight like it may arch a little bit it may come down at … a sort of an angle like a Bembo does or whatever…'.

Considerations with regard to the lowercase p must be given to this particular form in its own right:

{PrimaryGen}{Proced_Dev}
{Letter_parts}{Mutability}{FirstChars_lc}
Extract 31 (JT_2c, line 331)

'…but the p goes all the way round it's a bowl…'.

Within the considerations of creating new homologues, expert text typeface designers must balance the degrees of Homologous Mapping and Homologous Drift as to how much a new form will match or deviate from existing form. Ultimately, the new homologue must conform in some manner to the forms from which it draws influence and against which it must 'sit' in context:

{PrimaryGen}{Proced_Dev}
{Letter_parts}{Mutability}{FirstChars_lc}
Extract 31 (JT_2c, lines 333–334)

'…so all you can look at is … does it look like is it the same language…'.

Extract 31

JT_2c {PrimaryGen}{Proced_Dev}{Letter_parts}{Mutability}{FirstChars_lc}

322 JT: well there's you're aware of but they they fill their own spaces
323 MH: right
324 JT: so yeah you sort of put them side by side and yes you you think or well I
325 tend to do a lot of eh the only way it informs anything in that way is I would
326 take the character let's let's say the p and where the the line is thickening as
327 though the pen's going round that thickness I will sort of place it on top of
328 the n and see if it's the same put it side by side if it's optically the same
329 because the form is different you know well the n goes round and then goes down
330 to a straight like it may arch a little bit it may come down at at a sort of an
331 angle like a Bembo does or whatever but the p goes all the way round it's a bowl
332 and optically that that point is thicker than the stem of a straight so
333 it has it is different so all you can look at is is is it does it look like is
334 it the same language
335 MH: hm
336 JT: does it look like it well I mean obviously if one done with thin and one
337 done with thick it's not so it's a different type
338 MH: yeah
339 JT: so yes it's erm within the the realms of sort of say four to six units then
340 or eight units then it's erm it's the same thing the optics

4.2.2.6 Homologizing – Extrapolation and Interpolation

The acts of Extrapolation and Interpolation are well established within text typeface design practice and knowledge. The author of this research makes no claim to identifying these as new concepts within the current Grounded Theory rendering. However, extrapolation and interpolation of form with respect to typeface design are subsumed within the core category Homologizing, insofar that both acts utilize established or prior form in order that new relational or familial form can be developed.

Experts extrapolate to extend form in terms of variance of weight etc. For example from designing an initial standard or roman weight for a typeface, an expert designer may then derive a heavier weight such as bold or a lightweight version of the typeface based upon the regular or normal weight first established:

{Working_Phase}{Proced_Dev}{Variants}
Extract 32 (RN_1, lines 339–340)

> '…I would always and have always worked on the sort of what I would consider the base weight of the typeface the regular weight of the typeface…',

and:

{Variants}{Working_Phase}
{SystemNotion}
Extract 34 (MC_2, line 45)

> '…I would always start with the sort of regular weight'.

Extrapolation extends (or contracts) known values in relation to form in order to derive new relational form:

{Variants}{Tech_as_tool}{ExampleExperi}
Extract 35 (CS_1, lines 429–430)

> '…so we started with the black because if we can get that right you can figure out a regular and a thin…'.

In this respect and with reference to Homologizing form, designers use their established version or weight of a new design both in terms of individual characters and as characters collectively as Endogenous Generators for developing the extrapolated variant.

Interpolation in relation to typeface design is the nodal synthesis of form between two existing values/weights etc. For example, a typeface could be interpolated between light and heavy weight variants to produce a medium weight(s):

{Working_Phase}{Proced_Dev}{Variants}
Extract 32 (RN_1, lines 341–342)

> '…there are some designers that are … able to work on a light and an extra bold or whatever and let the computer produce the interim weights…'.

The nodal medium weight(s) are thus derived as a synthesis of form between light and heavy weights. When experts describe their actions in creating variants via extrapolation and interpolation, they are invariably describing the use of software as a tool to in some way negotiate, automate or semi-automate the process of transformations of form from their original state to a new state. The employment of software in undertaking such tasks is common in many fields. However, it is the decisions and actions related to the use of such automated or semi-automated processes that can be categorized by means of two dimensions that relate to both Extrapolation and Interpolation. These are outlined below as Synthetic Displacement and Synthetic Acquiescence.

Extract 32

RN_1 {Working_Phase}{Proced_Dev}{Variants}

RN: I I would always and have always worked on the sort of what I would consider the base weight of the typeface the regular weight of the typeface + erm even you know even if it's a sans serif family whatever I mean there are some designers that are are able to work on a light and an extra bold or whatever and let the computer produce the interim weights erm but in a way I I always felt that required too much initial input before the sort of design was fixed erm I'd much prefer to work on based the base weight erm at least to the point of getting pretty much alphabets made and then perhaps look at eh creating the the heaviest weight that you're going to need and the thinnest weight that you're going to need erm

Extract 33

MC_2 {Ref_Act_Design_learn}{Mutability}{Proced_Dev}{Variants}

MC: I would take the existing weight and I would start pushing and pulling it until I I got a result that I thought was good as I said earlier I think that erm you can very often tell a lot about the potential of a type family from the central weight you know erm whether this is whether this is going to be adaptable eh versatile or whether it's going to be more limited and and so on you know it's in the nature of the design erm but again I mean I I would back back in Verdana days as we talked about erm you know when when your regular weight of the typeface was a single pixel wide for the stem on the screen the only way to make it bolder was to double it I mean there was no half pixel you went from one to two which is a big jump in typographic terms so sometimes there are certain circumstances that force your hand but normally I would erm you know I I would make trial characters of a bold and look at them and say well I think I can push this a bit further and eh or not I've gone too far you know this is this is not going to reproduce well and so on you know so again it's a very very pragmatic business eh for me em it's it's sometimes + I I think I learnt this with Galliard which was the first you know that was a four weight family which is not a lot by modern standards but was quite a lot at the time and I learnt an awful lot through doing the particularly the black weight of Galliard and realizing it's partly a caricature of the existing typeface you know you you find yourself emphasizing certain features and so on it's + it + it's int it's an interesting job and there are of course tools that help you with that now but I don't use them very much I erm I at least at the start I tend to do it sort of brute force I tend just to redraw erm + eh + so you know if I if I expand this stroke to twice what it is now what does that do to the curves what does that do the oblique strokes and so on you know

Extract 34

MC_2 {Variants}{Working_Phase}{SystemNotion}	
43	MC: yes I would normally yeah I mean now a days very few typefaces exist in a
44	single weight or single width but I would always start in the middle erm yeah eh
45	+ yes I would always start with the sort of regular weight eh erm +++ I
46	think that's it's happened to me that I've changed that eh eh you know sometimes
47	when you build out the weights you find that you may have put the middle
48	(laughs) in slightly the wrong place so you're gonna interpolate something
49	slightly different and so on but I I would always try and work out the design in
50	what I though was the nominal standard for the one that it would be most used in
51	yes yeah

Extract 35

CS_1 {Variants}{Tech_as_tool}{ExampleExperi}	
428	CS: that that that depends on the project erm Stagg for Esquire they were the
429	ones that that said we want something really really heavy so we started with the
430	black because if we can get that right you can figure out a regular and a thin
431	that go with it but if you can't nail the black then fundamentally your idea
432	isn't working + eh for Guardian Egyptian we started with the regular because
433	that's the weight they wanted for all of their headlines eh for Neue Hass
434	Grotesque it was the medium because that is the classic ideal poster weight
435	typeface

4.2.2.6.1 Synthetic Displacement and Synthetic Acquiescence

Two dimensions emerge from this research and are related to both Extrapolation and Interpolation as sub-categories of Homologizing, these dimensions are identified here as Synthetic Displacement and Synthetic Acquiescence. These describe the ways in which expert designers negotiate the Homologizing of form from one state to another predominantly via the use of specialist software:

{Proced_Dev}{Mutability}{Tech_as_tool}
{Variants}{Working_Phase}
Extract 37 (MC_4, lines 6–7)

> '…although I don't use the very latest tools there are much better ones than the one I use … I have found that … very reliable…',

and:

{Tech_as_tool}{Proced_Dev}
{FirstChars_Uc}{FirstChars_lc}
{Mutability}{Variants}
Extract 38 (CS_1, lines 339–340)

> '…eight axis Superpolator file…'.

In essence Synthetic Displacement and Synthetic Acquiescence form polemics in terms of dimensions. The act of Synthetic Displacement describes the ways in which text typeface design experts intervene or interrupt – either manually or planned through the use of software – what may be determined as seamless automated Homologizing of form. In

relation to Extrapolation this can involve manually adjusting existing vector-based form in order to derive a desired extrapolated result:

{Ref_Act_Design_learn}{Mutability}
{Proced_Dev}{Variants}
Extract 33 (MC_2, lines 303–304)

> '…I would take the existing weight and I would start pushing and pulling it until … I got a result that I thought was good…'.

The expert's rationale can be related to knowledge and experience of the results that automation offers held against their own views and preferences, or in relation to purely practical attributes of the outcomes of automated Extrapolation:

{Proced_Dev}{Mutability}{Variants}
Extract 40 (MC_2, lines 334–338)

> '…there is a thing in Fontographer and I'm sure in Fontlab as well called change weight but … that's a bit like dipping in … chocolate you know I mean you sort of add weight all round … I would just redraw I mean I would … move the contours this way and that and so on and redraw the curves…'.

The ways in which experts intervene in relation to the automatic generation of form – Synthetic Displacement – relates to Interpolation also:

{Corrective_Judgment}{Tech_Constrain}
{ExampleExperi}{Proced_Dev}
{Mutability}{Tech_as_tool}{Variants}
{Working_Phase}
Extract 36 (RN_3, lines 14–15)

> '…things often I don't think work particularly well if they're taken in a purely sort of linear way…',

and:

{Proced_Dev}{Mutability}{Tech_as_tool}
{Variants}{Working_Phase}
Extract 37 (MC_4, lines 10–12)

> '…I would design the ultimate heavy weight and eh I would then interpolate the bold I would almost certainly want to edit it to some degree it depends on the design frankly how much…'.

In terms of Synthetic Displacement experts describe intervention in what could otherwise be a seamless automated process of homology, either from an initial form as point of origin to a target form – Extrapolation, or forms acting as extreme nodes that will allow for a synthetic median to result – Interpolation. In these instances designers interrupt, they displace what can be considered the smooth or synthetic linear transitions from object to target.

Conversely, expert typeface designers may enact or utilize design strategies that fully embrace the kinds of automation that software can provide:

{Tech_as_tool}{Proced_Dev}
{FirstChars_Uc}{FirstChars_lc}
{Mutability}{Variants}
Extract 38 (CS_1, lines 335–337)

> '…we really try to take advantage of eh I mean and we depend a lot on interpolation … not just to … make the weights in between but also interpolation as a design tool…'.

This can be equally both in relation to Interpolation as above or Extrapolation:

{Mutability}{Tech_as_tool}
{Proced_Dev}{Variants}
Extract 41 (CS_1, lines 350–351)

'…so the descender length is an independent thing that can be adjusted on it's own…'.

In these kinds of instances the expert allows for purely automated homology in terms of generating new form. The expert does not intervene but acquiesces in terms of interrupting the smooth or linear transitions of synthesis enabled by the use of appropriate specialist software – Synthetic Acquiescence.

The act of Synthetic Acquiescence is extended further still by some text typeface designers in relation to producing seamless homologized form. In such cases, where a text typeface design has been developed over a period of time for the regular weight etc., the design expert may then produce extrapolated variants as extremes by what ever means suffice. From the extremes the designer may then produce an interpolated mid or regular-weight. The objective in these cases is to adjust the extreme variants only in order to aim at a derived completely synthesized new median form. One that is generated entirely via a process of automated homology:

{Variants}{Proced_Dev}
{Tech_as_tool}{Mutability}
Extract 39 (JT_2b, lines 307–308)

'…the one in the middle the interpolation is sort of not touched by you that's so the only way of altering that is by altering the extremes…'.

In such instances of Synthetic Acquiescence, designers not only give tacit assent to the algorithmic generation of form in the shape of the new median weight. In doing so they also sacrifice or abandon the original regular version of the typeface they create in favour of a purely automated, uninterrupted homologized rendering of forms.

Extract 36

RN_3 {Corrective_Judgment}{Tech_Constrain}{ExampleExperi}{Proced_Dev} {Mutability}{Tech_as_tool}{Variants}{Working_Phase}

RN: so I think it you need to you would need to or you do need to look at each weight that's been created by the
MH: hm
RN: computer erm and make sure that it's functioning well I mean a a as an example erm you know things often I don't think work particularly well if they're taken in a purely sort of linear way if it's a sans serif family for instance the relationship erm between the thick and the thin strokes erm may need to vary from the sort of regular weight up to the bla if there's a black for instance erm the eh the the thin strokes in the black may well be proportionately thinner compared to the the vertical strokes erm and you wouldn't necessarily want that to work in a liner way through to the regular weight you might want a couple of steps there so you you I think you have to view these things carefully and plan them carefully
MH: hm
RN: so typically what I would do I mean when I was developing erm a typeface called Felbridge which is a sort of sans serif that was designed really for on screen use primarily but I I actually did the regular erm and a sort of extra bold I suppose and then did the black which was the heaviest weight as a separate development + because the the changes I was making to make the black work properly I didn't want to sort of to to affect the interpolations through regular to extra bold worked fine for a bold or a semi bold erm but the black I wouldn't have wanted the work I was doing to that to sort of filter down

Extract 37

MC_4 {Proced_Dev}{Mutability}{Tech_as_tool}{Variants}{Working_Phase}

MC: (Interpol)ation tools although I don't use the very latest tools there are much better ones than the one I use I I have found that very very reliable you know if if for the sake of argument I did I was given the job of doing a four weight family erm I would design the normal weight first the regular I would then not design the bold I would design the black I would design the ultimate heavy weight and eh I would then interpolate the bold I would almost certainly want to edit it to some degree it depends on the design frankly how much and then for the first pass at the light I would probably extrapolate that which is a sort of dodgier technique but is still very useful and in a way this is what we did as far back as Galliard with eh Ikarus Ikarus was very primitive at that time and couldn't handle italics at all for example but erm I I I I did get some sort of computer aided design help from Ikarus in the development of Galliard which is a long long time ago so yeah interpolation I think is a really really useful tool it can be abused eh but I I I I use it and erm … eh and erm I'm very pleased to be able to do so yeah

Extract 38

CS_1	**{Tech_as_tool}{Proced_Dev}{FirstChars_Uc}{FirstChars_lc}{Mutability}{Variants}**
335	CS: which eh which we really try to take advantage of eh I mean and we depend a
336	lot on interpolation not just not just to to make the weights in between but
337	also interpolation as a design tool or we'll do a version with bigger ball
338	terminals and smaller ball terminals and we'll look at the one's in between or
339	eh erm when I was working on the early stages of graphic I had I think an eight
340	axis Superpolator file where I could adjust erm everything from how open the
341	apertures were on the a and c and e the length of the descenders the length of
342	ascenders the overall tracking the height of the i dots and erm I just
343	manipulated these eh bunch of different tests erm but it was nice to to feel I
344	could do this methodically and do it by looking than blindly trying to hit a
345	target that I didn't quite know what it was

Extract 39

JT_2b	**{Variants}{Proced_Dev}{Tech_as_tool}{Mutability}**
307	JT: well the one in the middle the interpolation is sort of not touched by you
308	that's so the only way of altering that is by altering the extremes

Extract 40

MC_2	**{Proced_Dev}{Mutability}{Variants}**
334	MC: yes I mean I might not I might not I mean there is a thing in Fontographer
335	and I'm sure in Fontlab as well called change weight but that essentially eh
336	that's a bit like dipping in in chocolate you know I mean you sort of add weight
337	all round and I very seldom use that erm eh I would I would just redraw I mean I
338	would move move the contours this way and that and so on and redraw the curves
339	the arches and so on accordingly yes

Extract 41

CS_1	**{Mutability}{Tech_as_tool}{Proced_Dev}{Variants}**
349	CS: oh absolutely that would have been with only a handful of characters so and
350	and breaking and when you try to break it down into the component axes so the
351	descender length is and independent thing that can be adjusted on it's own

4.2.3 Homologizing Summary

Whilst the causal core category Trajectorizing (4.1) provides a theoretical explanation of the way in which text type designers begin the type design process or aspects thereof, drawing from precedents, developing initial original form, potential and momentum in the process of design, the causal core category Homologizing describes how type designers develop and progress a text typeface design in terms of relational qualities of constituent

forms. From the micro to the macro level Homologizing not only describes the actions and decisions brought to bear by designers relative to the range of developing letterforms within a text typeface design, but also describes how designers develop relational form relative to the emergent text typeface design.

Homologizing describes how the text typeface designer utilizes the potential of Constructed Precedents via Endogenous Generation to develop subsequent form within the system of design whilst allowing for mutability in developing the subsequent form. The developed concept of Homologizing within this research also describes the subtlety with which the text typeface designer develops familial form from one letterform or group of letterforms to the next, allowing for relational development of the typeface design as a group of independent forms that develop and function harmoniously as determined by the designer. Homologizing also includes the properties Homologous Mapping and Homologous Drift that explain the negotiation of mutability of relational form.

Homologizing explains how type design experts negotiate micro to macro relationships between the detail-level of individual character design and how this is has the potential to map against the development of the whole emerging typeface design. Negotiations of micro to macro levels of relationship in terms of form work at the level of the single character to relative typeface weight as well as negotiations of form from weight to weight within the development of type families. In the act of Homologizing, designers are utilizing form developed within the ongoing process of design to inform subsequent form as it develops, this is tempered with a caveat of mutability employed where necessarily appropriate. In this sense, relational, mutable form develops as opposed to merely mechanically homogenized form. Homologizing accounts for the subtle variation the text typeface designer develops from one form to the next whilst still maintaining cohesive rationality between multiple forms.

Trajectorizing as part of a series of inductive actions in relation to design allows for the recognition of potential and the influence this may have on

the system of design. This may include found references and precedents and those produced internally within initial stages of the 'system' of design. Relational form afforded by the results of what is described as the actions of the core category Homologizing, can be seen as verifying references or utilizing 'internal precedents', these are generated from the system of design and are used in order to locate and position the design as it develops.

Homologizing as a causal category describes instances whereby the type design expert accounts not only for identifying pattern but also for implementing action strategies in relation to this identification that will allow for procedural development of form within the establishing design process. Homologizing describes the type design expert's ability not only to recognize opportunity within the design system but that acting upon such opportunity will generate results of somewhat predictable or foreseeable nature based upon forms developed relative to form created as a product of Trajectorizing. Homologizing describes instances whereby certain establishing elements within a design are utilized as 'progenitors' of foreseeable design instances. However, such predictability is not certain or fixed but acknowledges mutability within the system of design. This may include repeated patterns of form that may be identified but also mutable pattern that must adapt or be adapted as part of procedural development within the system of design. Homologizing describes the development of relational or familial form that is established and developed within and throughout the design process.

The property Homologous Mapping relates to new form created within the developing system of design that is directly informed by existing established form within the same system. Homologous Mapping may occur as a direct result of prior Trajectorizing via an Endogenous Generator. In turn as Homologizing establishes relational form, each newly established form (or groups of forms) thereafter have the possibility of becoming an Endogenous Generator with the potential to inform further subsequent developing form. Homologous Drift accounts for the varying levels of mutability that the text typeface designer allows for when developing relational form between characters, their constituent parts or groups of

characters. Homologous Drift accounts for the variation in form within the typeface design and its constituent parts yet maintaining harmonious or relational qualities or characteristics. If the amount of Homologous Drift encountered is too extreme the designer may be in the position of Trajectorizing new form once more.

The core category Homologizing also includes the developed sub-categories Synthetic Acquiescence and Synthetic Displacement. Homologizing not only accounts for the relational qualities developed at the micro level of characters or parts of characters within the developing typeface design, but also accounts for the development of relational form across the development of type families of related form. The developed related subcategories Synthetic Acquiescence and Synthetic Displacement describe causal phenomena in relation to Homologizing with particular attention to employing software in the automation of Homologizing between extrapolated and interpolated forms.

Homologizing not only accounts for the designing of form but may also be used to describe other relational aspects relative to typeface design, for example spacing and hinting. Homologizing as a core Grounded Theory category accounts for decisions and actions that describes and explains the nature of developing harmonious relational qualities between emergent and emerging phenomena within the process of text typeface design.

4.3 Processes of text typeface design: Attenuating

Contents

4.3 Attenuating

4.3.1 Introduction

This section outlines the developed core category **Attenuating** and it's related sub-categories **Attenuation**, **Accretive Amelioration**, **Envisioning** and **Historical Immersion**. As in previous sections 4.1 and 4.2, the relationship of core category and relative sub-categories is highlighted with reference to Glaser's theoretical familial categories – the Six Cs (Glaser 1968). Table 4.3.1.1 shows the relationship of Attenuating and its sub-categories aligned to Causal, Conditional, Consequential and Contingent categorizations, these relationships will be described further within this section below.

Core Category	Sub-Categories		
Causal	Conditional	Consequential	Contingent
Attenuating	**Attenuation**	**Accretive Amelioration**	**Envisioning** **Historical Immersion**

Table 4.3.1.1
Relationship of the core category *Attenuating* to sub-categories

To reiterate, in this section, the raised core and sub-categories are developed as Grounded Theory as described in the introduction to this chapter 4.0. Table 4.3.1.2 shows the relationship of the core category Attenuating and its developed sub-categories: Attenuation, Accretive Amelioration, Envisioning and Historical Immersion. This table also shows the relationship of sub-categories to the substantive coding and coding descriptions relative to coding at the primary data level. This makes explicit the hierarchical lineage of the raised conceptual categories relative to coding at the data level. Again, as in sections 4.1 and 4.2, extracts from the primary data will be used to illustrate and evidence developed theoretical concepts and assertions.

Attenuating – Codes relating to core category

Sub Cat > Code	Definition
***Attenuation** + [Accretive Amelioration] (Consequential)*	
Comparison	Participant describes making comparisons within the process of designing type
Corrective Judgment	Participant describes making judgments in identifying and improving elements perceived to be incongruous in relation to the overall design of the typeface
Improvement	Participant describes decision making in terms of Improvement
Testing	Participant describes testing of characters eg. introduced to form words etc.
Historical Immersion	
FromKnowledge	Participant drawing from prior knowledge – initially declarative
Ref Conv Broad	Participant makes reference to broad or general established method or pattern of description/classification
Ref Conv Spec	Participant makes specific reference to methods/methodologies/ practices etc. that inform conventional notions of the subject. Eg. the use of the broadnib pen in calligraphy informing the oblique axis of a typeface design etc.
Ref Know Hist Cont	Participant refers to knowledge/influence of history and context of subject area
Envisioning	
Autonomy	Participant describes having/needing to have a single view of design process/decisionmaking
Experience	Participant identifies an element where experience/ability/ appreciation bears upon the process of designing type.
Overseeing	Participant describes the importance of a single person's overview in relation to collaborative work.
Personal approach	Participant offers opinion or thinking toward personal approach or philosophy of design
Projecting user usage	Participant projects how the design may may used
Ref Act Design learn	Participant references the ACT of 'doing' design and learning through 'doing'
Ref Context	Participant referring to context (of use) as important in the development of the typeface design
Ref Originality	Participant makes reference to originality in work
Ref Reflection learning	Participant makes reference to reflection/learning

Table 4.3.1.2
Table showing lineage and relationships of coding at the substantive level up through conceptual categories with reference to the core category

4.3.2 Attenuation

The text typeface designer is faced with a paradox of working simultaneously at micro and macro perspectives within the design process. In order to establish and develop flow in the process of design, the link between the design of the initial characters as forms in themselves, and how these forms relate to each other as they develop, requires the designer to switch between the micro view of detail in the individual character design and the macro view of interrelationship between characters. Initially, design begins with very few elements. As more elements are introduced this creates more for the designer to compare and work upon. Comparison between macro level testing of words and micro level adjustment of character forms becomes more complex as more characters are introduced to the design. Homology (section 4.2) to some extent controls certain variables within a design. However, improvement in the design is made via the constant contextual testing of forms alongside each other, eventually as words or word-type shapes and later as sentences and paragraphs (as the design develops further) where the designer checks for problems, inconsistencies and incongruity within the relational design of forms and spacing in the text typeface. From the initial elements within the early 'control characters', and as momentum builds in the design of the text typeface, the designer is Attenuating incongruity in the developing forms and spacing of the typeface. In doing so Attenuation of disturbances within the forms and spacing of the design – their inter-relationship and inter-dependency to one another becomes a condition of the act of Attenuating.

4.3.2.1 Accretive Amelioration

The sub category Accretive Amelioration was raised as directly consequential to Attenuation. This category conceptually encapsulates the phenomenon of resultant improvement in a developing design over time. Where the direct acts of Attenuation explain instances of improvement within the processes of text typeface design at micro levels, Accretive Amelioration conceptualizes holistic improvement in the typeface design at macro levels. The complexity and detail demanded of text typeface design results in text typeface design problems not so much as being solved but being resolved by

the designer, often returning again and again to iteratively reduce identified incongruity.

4.3.2.2 Attenuation of incongruity through testing

Text typeface designers test continuously for incongruity in the development of their designs. Testing begins early in the process of design and can begin with very few forms:

{Ref_Act_Design_learn}{Testing}{FirstChars_lc}
Extract 43 (MC_2, line 29)

'…even if I'm just doing h o h o h o coming down the laser printer…'.

This can also include attributed spacing or side bearings being introduced from the very beginning of the process:

{Ref_Act_Design_learn}{Testing}{FirstChars_lc}
Extract 43 (MC_2, line 30)

'…I'm giving it side bearings I mean these letters don't exist in a vacuum…'.

Crucially, it is the relationships between forms, and forms and spacing that afford the designer the opportunity to attenuate incongruity within a design:

{PrimaryGen}{Ref_Other_prior}{Testing}
Extract 42 (RN_1, lines 142–144)

'…well I it it's a matter of just putting together a few combinations of those letters erm and making sure that the the eye just sort of continues to run along smoothly…'.

Testing at a macro level allows the designer to attenuate for micro level details as these become more apparent within a context of related form and spacing:

{PrimaryGen}{Ref_Other_prior}{Testing}
Extract 42 (RN_1, lines 144–146)

'…that there's nothing that stands out either in its weight or its structure erm that sort of jars in the general progression or reading through the letters…'.

Amelioration is achieved via the designer knowing or sensing what doesn't work within a given developing design:

{Ref_Act_Design_learn}{Testing}{FirstChars_lc}
Extract 43 (MC_2, lines 32–34)

'…if I set n u n and … the u doesn't look in the middle between two n's I know something is the matter…'.

Experience and familiarity with successful design affords the design expert the ability to detect and filter incongruity within a design:

{PrimaryGen}{Ref_Other_prior}{Testing}
Extract 42 (RN_1, lines 146–147)

'…it's a difficult thing to put into words really I mean a lot of it is the experience of … looking at typefaces…',

as seen illustrated here also:

{Ref_Act_Design_learn}{Testing}{FirstChars_lc}
Extract 43 (MC_2, lines 35–36)

'…so I think some of those things do become erm sort of informed by experience and instinct…'.

However, this doesn't necessitate that the designer will know what to do in terms of design that will work successfully, only that the designer is aware of what does not work within a developing design:

{Ref_Act_Design_learn}{Testing}
{FirstChars_lc}
Extract 43 (MC_2, lines 36–37)

'…but that doesn't mean to say that you can't get them wrong over and over again…'.

Extract 42

RN_1 {PrimaryGen}{Ref_Other_prior}{Testing}	
142	RN: erm well I it it's a matter of just putting together a few combinations of
143	those letters erm and making sure that the the eye just sort of continues to run
144	along smoothly erm that there's nothing that stands out either in its weight or
145	its structure erm that sort of jars in the general progression or reading
146	through the letters erm it's a difficult thing to put into words really I mean a
147	lot of it is the experience of (laughs) looking at typefaces I mean obviously
148	with the wealth of typefaces that I've always had around me at Monotype erm
149	there's always good references and you can look at other successful typefaces erm
150	if you're working with book typefaces you know you can look at Bembo or Plantin
151	or whatever to see how they look when you when you set words and it gives you a
152	good sort of structure to work on new designs

Extract 43

MC_2 {Ref_Act_Design_learn}{Testing}{FirstChars_lc}	
28	+ erm also this business of
29	you know eh even if I'm just doing h o h o h o coming down the laser printer eh
30	I I'm I'm giving it side bearings I mean these letters don't exist in a vacuum
31	they they exist with a space and eh I may change that a great deal you know eh
32	if I if I set n u n and the and the n doesn't look as though it's in the middle
33	+ the u doesn't look in the middle between two n's I know something is the
34	matter you know the o isn't centred between two n's presumably and so on + erm
35	so so I think some of those things do become erm sort of informed by experience
36	and instinct + erm but that doesn't mean to say that you can't get them wrong
37	over and over again

4.3.2.3 Attenuation via comparison

Text typeface designers often utilise comparison as an active means of Attenuating their developing designs. Comparison in this respect can take the form of using extant designs as referents. Existing designs may be utilised in such a way where the designer finds incongruity within an extant design and in identifying such, this aids in Attenuating the new design to steer it from repeating existing identified problems:

{Improvement}{Des_Prob_Inherent}
{Comparison}{PrimaryGen}
{Ref_Other_prior}
Extract 44 (RN_2, lines 66–68)

'…the conversion from Bembo erm from hot metal into digital well into phototypesetting and into digital type hadn't been particularly well done and it had it's shortcomings…',

and:

{Improvement}{Des_Prob_Inherent}
{Comparison}{PrimaryGen}
{Ref_Other_prior}
Extract 44 (RN_2, lines 69–70)

'…we were trying to improve on what we already had for Bembo…'.

Comparative testing can also facilitate optimizing the performance of a newly developing design:

{Des_Prob_Inherent}{DesDelimiters}
{Comparison}
Extract 45 (MC_1, lines 178–179)

'…we had a bench mark in the form of a what was called MS Sans…',

and:

{Des_Prob_Inherent}{DesDelimiters}
{Comparison}
Extract 45 (MC_1, lines 180–181)

'…so we had something to compare what became Verdana…',

also:

{Des_Prob_Inherent}{DesDelimiters}
{Comparison}
Extract 45 (MC_1, lines 182–183)

'…we put up the same paragraph in MS Sans and in Verdana on the screen and walked backwards until one of them we couldn't read and one of them we could…'.

Attenuation of the new design continues whilst being compared to an existing design(s) that is known to work well but one where the designer has a sense that the new design can improve upon what exists. In this kind of example, the designer is Attenuating both the existing and new design in terms of identifying and resolving incongruity. Attenuation of the newly developing design takes place in some form. The continual checking, correcting and adjusting of the design over time leads to consequential Accretive Amelioration. The design improves by means of the designer identifying and being conscious of what isn't working well when comparing one design to another and then adjusting to compensate for this in the new design.

In contrast to comparing to extant forms, aspects internal (solely belonging to a new design) to a developing design itself may be used to provide reference points for comparison, aiding the Attenuation of identified incongruent elements within the new design:

{Comparison}{Proced_Dev}{Italics}
Extract 46 (JT_1c, lines 160–163)

'…I'm comparing a lot so even though different wildly different forms they're still there's got to be some kind of language of eh unity between them something's I'm looking at well the g's not working is it something wrong with the form of the g and the balance of it…'.

Attenuating in this sense has a direct relationship to homology (sectin 4.2) whereby the Attenuation of incongruity aids the refining of mapping relational or familial attributes between characters. This may also relate to their component parts or variables, such as relationships between character attributes in roman and italic forms in a developing Latin typeface design.

Extract 44

	RN_2 {Improvement}{Des_Prob_Inherent}{Comparison}{PrimaryGen} {Ref_Other_prior}
66	RN: erm because I think the conversion from Bembo erm from hot metal into digital
67	well into phototypesetting and into digital type hadn't been particularly well
68	done and it had it's shortcomings and with Dante because it's a sort of fairly
69	closely related design we were trying to improve on what we already had for
70	Bembo so sometimes there is a sort of clear objective in that way…

Extract 45

	MC_1 {Des_Prob_Inherent}{DesDelimiters}{Comparison}
178	… and we had a bench mark in the form of a
179	what was called MS Sans which had been their eh their own eh sans serif typeface
180	that the engineers had made at eh Microsoft so we had something to compare what
181	became Verdana to and we did this in a very sort of seat of the pants way I mean
182	we put up the same paragraph in MS Sans and in Verdana on the screen and walked
183	backwards until one of them we couldn't read and one of them we could you know
184	erm so so that the design of Verdana really grew out of the bitmaps

Extract 46

	JT_1c {Comparison}{Proced_Dev}{Italics}
158	…these ones here are erm this is
159	sort of typical what I'm doing designing a typeface once I've got erm a roman and
160	an italic up to one level then I'm comparing a lot so even though different
161	wildly different forms they're still there's got to be some kind of language of
162	eh unity between them something's I'm looking at well the g's not working is it
163	something wrong with the form of the g and the balance of it erm or it may be
164	that I'm drawing over here what I imagine the display version to be
165	MH: hm
166	JT: a lot finer s's yeah this is the roman s is the s actually this kind of
167	thing or is it more this

4.3.2.4 Attenuation via developed corrective judgment

Expert text typeface designers develop a sense of corrective judgement that enables them to identify and attend to incongruity in emerging typeface designs. Because of the developed experience they have in designing typefaces they are able to employ working patterns, tools and 'tricks' that

facilitate attending to incongruity at the micro level that disturbs the design at the macro level:

{Corrective_Judgment}
Extract 47 (MC_2, lines 177–181)

> '…these proofs that I've built up over time are diagnostic proofs really you know they're intended because of certain combinations of letters that you know are going to be problematical… they are intended to help me spot eh things that might be going wrong…'.

A sense of corrective judgment may also be developed in the form of working partnerships, whereby the designer has an acute awareness of the strengths they have at identifying particular kinds of incongruity:

{Improvement}{Corrective_Judgment}
{Collaboration}
Extract 48 (CS_1, lines 373–374)

> '…Paul I think is stronger with the with the conceptual things…',

and:

{Improvement}{Corrective_Judgment}
{Collaboration}
Extract 48 (CS_1, line 379)

> '…whereas I keep an eye on the … more practical nuts and bolts things…'.

A developed sense of corrective judgment also includes knowing what characters within a typeface or what attributes of characters may give rise to problems or incongruity in the process of developing a text typeface design:

{Corrective_Judgment}
Extract 47 (MC_2, lines 183–184)

> '…if there's something slightly the matter with your s if you see a double s it may be more obvious…',

and:

{Improvement}{Corrective_Judgment}
{Collaboration}
Extract 48 (CS_1, lines 379–381)

> '…these things are not spaced properly this part's inconsistent with these parts or here … these weights are not right the smallcaps are the wrong size…'.

Very experienced text typeface designers have awareness that not only will they have to attend to incongruity within developing designs but that incongruity may present itself at times in specific or predictable ways. Experience enables designers to develop coping strategies and mechanisms that aid and facilitate corrective judgment in Attenuation of incongruity within developing text typeface designs.

Extract 47

MC_2 {Corrective_Judgment}

177 MC: yes I mean these proofs that I've built up over time are diagnostic proofs
178 really you know they're intended because of certain combinations of letters that
179 you know are going to be problematical or or whatever it is I mean I eh only
180 these look rather odd some of these proofs in terms of the text and so on but
181 they they are intended to help me spot eh things that might be going wrong in in
182 it yeah diagnostic is the right word I mean they they eh you know eh if if if
183 there's something slightly the matter with your s if you see a double s it may
184 be more obvious you know you may may may be clearer to you what is the problem
185 you and since in English there are a great many double characters that's that's
186 a thing I always look at erm it's sort of eh eh (gestures with hands) emphasizes
187 something that might might be wrong with it if you see
188 MH: yeah yeah
189 MC: two of them together yeah so a lot of little tricks like that I suppose
190 that I I've learnt to help me eh … spot these things

Extract 48

CS_1 {Improvement}{Corrective_Judgment}{Collaboration}

373 CS: so what naturally happens is Paul Paul I think is stronger with the with
374 the conceptual things and so he'll he'll be the the angel on everyone's
375 shoulders saying you know we can you know that we said this was going to feel
376 very early twentieth century it's starting to feel a little different from that
377 are we sure + this doesn't quite feel right these proportions feel really
378 regular and I'm not sure that that's what we decided upon and that's what we
379 want whereas I keep an eye on the the more practical nuts and bolts things these
380 things are not spaced properly this part's inconsistent with these parts or here
381 erm these weights are not right the smallcaps are the wrong size eh which isn't
382 to say that Paul doesn't notice those things and doesn't mention them and that I
383 don't say you know this a no longer feels like it fits with the rest of the
384 typeface this feels really casual where the rest is very rigid we should do
385 something about this but it's more that erm our general tendency is to fall more
386 to erm to Paul being the the big picture art director and I'm the nuts and bolts
387 getting things done

4.3.2.5 Attenuation and Improvement

The goal or consequence of Attenuation is to bring about improvement in a developing design. Improvement within a typeface design will take the form of gradual refinement Accretive Amelioration (as mentioned above). However, it is appears that the expert text typeface designer is constantly Attenuating – constantly looking to improve upon what they identify as incongruity. This continual focus upon improvement is not only attributable to attending to micro details within a typeface design:

{Improvement}
Extract 49 (JT_2a, lines 26–28)

'…if it's with a text type then … it's the harmony of keeping the strokes consistent so nothing stands out anymore than another one…'.

At times, the on-going gradual refinement of an element within a typeface design may no longer provide a route to improvement:

{Improvement}
Extract 49 (JT_2a, lines 33–34)

'…sometimes you think if that's the trouble then you just have to get rid of that g and just put a single storey g in…'.

Attenuation in such cases is the removal and replacement of elements that then facilitate improvement of the overall design. This latter remedial procedure may result in the designer Trajectorizing new form once again that will then be subject to later acts of Attenuation in order to find congruous fit.

Improvement was also coded for within the primary data as related to the macro view of typeface designs where participants identified or reflected upon how Attenuation of incongruity in some form was related to the actual improvement or the desire to improve design:

{Improvement}
Extract 50 (RN_2, lines 257–258)

'…yes I mean … I think there's precious little that I'd feel fully satisfied with…',

and:

{Improvement}
Extract 50 (RN_2, lines 260–261)

'…so you know so everything I I've been involved with I think there were probably areas that could be improved…'.

This developed ability of the designer to sense where improvement may be brought about is not only focused toward their own work but includes the ability to identify such opportunity in existing work.

Extract 49

JT_2a {Improvement}

… there's a style which follows through erm if it's with a text type then you it's the harmony of keeping the strokes consistent so nothing stands out anymore than another one if you have either too much variation or if if a quirky idea suddenly you say it would be really nice to do a g like that a lowercase g then there's sort of levels if it goes too far then it just sticks out you know like classic thing were you've got a a double bowl g and you've got two together then you always sort of see these things spotting erm that's an on-going sort of nightmare and sometimes you think if that's the trouble then you just have to get rid of that g and just put a single storey g in

Extract 50

RN_2 {Improvement}

257 RN: (laughter) yes I mean I I think there's precious little that I'd feel fully
258 satisfied with … erm but in a way I think that if you work in a sort of creative
259 environment if if you are totally happy with everything you do you sort of loose
260 the momentum a bit somehow it (laughs) so you know so everything I I've been
261 involved with I think there were probably areas that could be improved (laughs)

4.3.3 Historical Immersion

Expert text typeface designers draw upon a deep and innate sense of the history of their subject discipline that implicitly or explicitly influences both their approach to design as well as the development and refinement of designs they produce in themselves. Historical Immersion as a sub-category of Attenuating accounts for the way in which designers' knowledge of history and reference to history becomes a major contributing factor in the way that they see, situate and adjust their developing designs or approach to design as a response to such knowledge. The concept of Historical Immersion can be seen as a contingent factor of Attenuating, allowing Attenuation to become operationalised. This sub-category accounts for the wealth of knowledge that expert text typeface designers draw upon as declarative knowledge. Historical Immersion accounts for the background context against which designers gauge and make judgments about their developing designs, influencing and shaping their critical view of design against their knowledge of what has preceded or that which is extant. This can relate to designers' own past work and experiences as much as it can to the reference of knowledge pertaining to a body or canon of work. Likewise, Historical Immersion may refer to a knowledge of others' work and working practices that assists the expert designer in managing the development of their own design or ways of designing by way of drawing parallels that aid in Attenuating a developing design.

4.3.3.1 Innate referencing to historical context

Historical Immersion is a key and consistent theme that arose from the data analysis via the way in which participants made reference to

historical dimensions of type and lettering design. This contingent aspect of Attenuating appeared either as references to historical models, specific designs or sources, along with candidly divulging routinely referencing history in their work. Evidence within the primary data suggested that the participants had such intimate understanding of the history of their subject, that such historical referencing was innate. Extract 51 highlights the confidence and ease with which the participant makes reference to the knowledge of the history of typeface design:

{FromKnowledge}
Extract 51 (JFP_1, lines 166–167)

'…and after the historical model I know them … I know the history of typeface…'.

The participant also gives an example of this knowledge by referring to typefaces regarded as having a geometrical influence in their design structure demonstrating a confidence of knowledge of known historical forms. Likewise in Extract 52, clear reference is made to the innate or tacit sense in which expert designers draw from history as something that informs their sense of design. The same extract also gives insight to the nature in which history informs approaches to design but it is also explicit in that it retains a sense of self-determination on the part of the designer, or purpose in their view of approaching design:

{FromKnowledge}
{Ref_Know_Hist_Cont}
{Ref_Conv_Broad}{Proced_Dev}
{PrimaryGen}
Extract 52 (MM_1, lines 44 to 49)

'…of course sometimes I look at historical forms or I look at Bembo or I look at Bodoni if it's necessary or whatever … but but it's not like … I'm going to look at it and make the same thing…'.

Expert designers utilize knowledge of historical examples of design of design as contributory backgrounds against which to guide, judge or position their own design work and its development.

Extract 51

JFP_1 {FromKnowledge}	
166	JFP: + and and after the historical model I know them + I
167	know the history of typeface + I know what is a Nobel is +
168	what is a Futura + what is a Erbar is + I know what is a
169	Avant Garde is etcetera + Forma or what ever + all the
170	typeface with eh eh a geometrical flower on it

Extract 52

	MM_1 {FromKnowledge}{Ref_Know_Hist_Cont}{Ref_Conv_Broad}{Proced_Dev} {PrimaryGen}
44	MM: + erm referring is a bit eh + I'm not referring to historical it's more that
45	it is in my mind I know what has happened in history and (shakes hand and
46	gestures to his head) it's here somewhere + you know of course sometimes I look
47	at historical forms or I look at Bembo or I look at Bodoni if it's necessary or
48	whatever + but but it's not like + I'm going to look at it and make the same
49	thing

4.3.3.2 Direct referencing to historical context

In relation and in contrast to participants' references to drawing upon innate or tacit knowledge or knowing of history relative to typeface design, a sense of Historical Immersion through a direct referencing of history was also significant in the data. Designers describe the purposeful engagement with history as a dimension of designers' approach to the subject of typeface design:

{Ref_Know_Hist_Cont}{PrimaryGen}
Extract 53 (RN_2, lines 221–224)

> '…for me I'm always informed by what's gone before … I suppose because I've always sort of taken an interest in the history of type and the development and the development of type over the years…',

and:

{Ref_Know_Hist_Cont}{PrimaryGen}
Extract 53 (RN_2, lines 228–231)

> '…I'm always informed by what I've seen from … the sort of history of type development…'.

Expert designers constantly engage with the history and development of the subject and how this contextually informs their approach to typeface design. Historical Immersion is an element of the action of Attenuating insofar that engagement with the history of the subject not only informs and contextualizes the potential development of the approach to design but also assists in steering or directing the design particularly in terms of development of potential originality as opposed to the serendipitous duplication of existing work or ideas:

{Ref_Conv_Spec}
{Ref_Know_Hist_Cont}
{DesignSpaceID}{DefDesSearch}
{Collaboration}{FromKnowledge}
{PrimaryGen}
Extract 54 (CS_1, lines 129–137)

> '…whether that's a conscious relationship that you are in control of or you are accidentally channeling something that you saw once you don't realize that you've made a replica of some existing typeface eh because you do you do see a lot of that…'.

Extract 53

RN_2 {Ref_Know_Hist_Cont}{PrimaryGen}

221 RN: for me I'm always informed by what's gone before
222 MH: hm
223 RN: erm + I I suppose because I've always sort of taken an interest in the
224 history of type and the development and the development of type over the years
225 and and I'm still amazed when I look back at the diversity of type design even
226 sort of going back a hundred plus years erm you know you look at some of the old
227 ATF catalogues and so on to see the range of almost grunge typefaces that they
228 had at one time and you it still amazes me so I'm I I'm always informed by what
229 I've seen from
230 MH: hm
231 RN: the sort of history of type development

Extract 54

CS_1 {Ref_Conv_Spec}{Ref_Know_Hist_Cont}{DesignSpaceID}{DefDesSearch}{Collaboration}{FromKnowledge}{PrimaryGen}

129 CS: I well sketches we Paul and I always take a look at historical models erm
130 because inevitably what you do is going to have some relationship with history
131 and whether that's a conscious relationship that you are in control of or
132 you are accidentally channeling something that you saw once you don't realize
133 that you've made a replica of some existing typeface eh because you do you do
134 see a lot of that erm and that's a very easy thing to do you always hear about
135 songwriters saying you know I woke up this morning and thought I wrote the most
136 amazing song but it was actually Let It Be (laughs) erm so we we we really try to
137 do our research

4.3.3.3 A broad view of convention in relation to historical context

A developed awareness and appreciation of convention plays a significant role in the way that expert text typeface designers view and see type design as being situated historically. This aspect of Historical Immersion in relation to Attenuating enables designers to gauge how likely an aspect of design will work or be acceptable on the basis of comparative similarity or familiarity with understood and accepted conventional norms. Attenuating with respect to the experts' awareness of convention ensures that a new design, or aspects of a given design do not stray too far from what is perceived to be acceptable or expected in terms of text typeface design. Convention with regard to typeface design can be regarded as a broad construct with which designers use to measure and judge against:

{Ref_Other_prior}
{Ref_Conv_Broad}
Extract 55 (GU_2a, lines 98–100)

'…we know how important convention is even if you have not made a special study of it why is convention so important what exactly is convention … how does it work…'.

Historical reference relative to Attenuating may also include knowledge of broad and recurrent problems of convention that the text typeface design must develop awareness of in order address or redress:

{Ref_Conv_Broad}
{Ref_Know_Hist_Cont}
Extract 56 (MC_4, lines 46–47)

'…reconciling these two alphabets in the same typeface is a perennial problem I mean we wrestle with this every type design…',

and also:

{Ref_Conv_Broad}
{Ref_Know_Hist_Cont}
Extract 56 (MC_4, lines 54–57)

'…this comes up very often in type design reconciling things which have different histories different forms making them look as though they belong together to some to some degree…'.

A broad conventional awareness can relate to the design or inherent considerations of the forms of a text typeface but may also focus on how a typeface performs relative to conventional expectation:

{Ref_Conv_Broad}{Ref_Context}
{DefDesSearch}{DesignSpaceID}
Extract 57 (RN_1, lines 400–402)

'…there is a sort of relatively narrow field in which a typeface performs really well … as a book typeface a typeface for continuous reading…'.

In this respect expert typeface designers are aware that deviation from conventional expectation may result in problems within the typeface design that they would wish to avoid or attenuate if such problems did arise:

{Ref_Conv_Broad}{Ref_Context}
{DefDesSearch}{DesignSpaceID}
Extract 57 (RN_1, lines 402–403)

'…any thing that's too sort of flamboyant or whatever … is going to soon become tiresome…'.

However narrow the constrictions of convention appear to the expert, they are also aware that within the broad scope of convention, there is also room for flexibility at the micro level of detail in a design that will also surface at the macro level:

{Ref_Conv_Broad}{Ref_Context}
{DefDesSearch}{DesignSpaceID}
Extract 57 (RN_1, lines 407–410)

'…there's always scope for sort of little nuances that you can put in to characters which often if you reading ten point ten point text are not really noticeable or visible erm but may be do have their influence subliminal sort of influence on the design…'.

Extract 55

GU_2a {Ref_Other_prior}{Ref_Conv_Broad}

GU: and I think that any type designer like Matthew and Erik and me and many others who do text face design mainly text face design we hardly in display design we are all basically text face designers we know how important convention is even if you have not made a special study of it why is convention so important what exactly is convention + eh how does it work etc.

Extract 56

MC_4 {Ref_Conv_Broad}{Ref_Know_Hist_Cont}

MC: if you go back far enough you can see sort of atavistic similarities and so on but but we've lost that eh + and reconciling these two alphabets in the same typeface is a perennial problem I mean we wrestle with this every type design you know and in the very earliest days roman roman like type it was not solved I mean the relationship between the capitals and lowercase in early forms of roman is just not right I mean it was Aldus's in my opinion it was Aldus's typeface of 1495 that first did that made the capitals and lowercase look like they were part of the same typeface so dealing with these anomalies if you like capitals and lowercase the figures are Arabic for goodness sake you know what are they doing there erm dealing with italics which are different so I mean the this comes up very often in type design reconciling things which have different histories different forms making them look as though they belong together to some to some degree you know we talked earlier about the problem of trying to eh deal with relationship between different writing systems

Extract 57

RN_1 {Ref_Conv_Broad}{Ref_Context}{DefDesSearch}{DesignSpaceID}

RN: well I think in some ways it does erm + because there is a sort of relatively narrow field in which a typeface performs really well as a as a book typeface a typeface for continuous reading erm you know there any thing that's too sort of flamboyant or whatever is is going to soon become tiresome I think to to reading in quantity erm and in terms of the sort of overall colour on the page the number words that you get to the line and so on there are optimums for that and if you go too far from those then it doesn't the typeface won't fulfill its function so I think there is a relatively narrow band I mean there's always scope for sort of little nuances that you can put in to characters which often if you reading ten point ten point text are not really noticeable or visible erm but may be do have their influence subliminal sort of influence on the design + erm + yeah I mean I think there are sort of constrictions on how far you can go with the design when it's has to fulfill a particular purpose

4.3.3.4 Specifics of convention in relation to historical context

Complementary to a sense of broad conventional considerations with respect to Historical Immersion and Attenuating, type design experts utilize knowledge in terms of a developed sense of detailed understanding of conventional specifics. Acute awareness of detailed and specific aspects of historical convention in relation to type design and letterform design allows the designer to attenuate relative to a comparative background of declarative knowledge. Such insight with regard to Historical Immersion can include knowledge of the history and traditions of tools and processes and the relationships between these in the rendering of form:

{DefDesSearch}
{Ref_Know_Hist_Cont}
{Ref_Conv_Spec}
Extract 58 (ES_1, lines 122–123)

'…Bodoni's Bodoni because it's copper engraving as opposed to … cutting into lead…'.

Convention with respect to text typeface design extends then not only to the history of typeface design but to a history of form derived from making and designing letters, whereby the tools, materials and process involved directly influence the shaping of letterform:

{DefDesSearch}
{Ref_Know_Hist_Cont}
{Ref_Conv_Spec}
Extract 58 (ES_1, lines 127–128)

'…I find that quite informative if I look at the tool…'.

Knowledge of such detail in the construction of letterforms via tool specific and technique specific influence enables designers to gauge and judge convention in terms of the expected or anticipated way that form should appear:

{DesignSpaceID}{DefDesSearch}
{Ref_Other_prior}{PrimaryGen}
{Ref_Conv_Spec}
Extract 59 (JT_2a, lines 120–122)

'…static arches so as a … typeface in more recent years may have a curve the stem goes down you lift the pen then you start the arch…'.

Specifics of convention can relate to knowledge of styles, genres or oeuvres in relation to historical references, whereby Attenuating specific details may allow for alignment to such former associations:

{DesignSpaceID}{DefDesSearch}
{Ref_Other_prior}{PrimaryGen}
{Ref_Conv_Spec}
Extract 59 (JT_2a, lines 116–117)

'…or the E where the arms are pretty much even but actually pull the centre one back in so you've got that more old older grot kind of oddity…'.

Extract 58

ES_1 {DefDesSearch}{Ref_Know_Hist_Cont}{Ref_Conv_Spec}	
121	yes yes essentially because erm + there are also reasons for why these
122	things exist I mean there are technical reasons you know Bodoni's Bodoni because
123	it's copper engraving as opposed to to cutting into lead which he did but but
124	the history of technology is the history of type or the history of type is the
125	history of technology also you know whether it is wood or copper or steel or
126	clay or litho you know the stone the brush the chisel the engraving tool we all
127	know that that's made a difference and eh I find that quite informative if I
128	look at the tool

Extract 59

JT_2a {DesignSpaceID}{DefDesSearch}{Ref_Other_prior}{PrimaryGen} {Ref_Conv_Spec}	
113	JT: ie. News Gothic News Gothic grots Formata I wrote Formata down there I'm
114	not quite sure about why I did square dot or squarish form not Eurostyle
115	slightly exaggerated proportions then I got may be like the Gill E for instance
116	or the E where the arms are pretty much even but actually pull the centre one
117	back in so you've got that more old older grot kind of oddity
118	MH: hm
119	JT: erm creates awkward spaces but then that's what I wanted something
120	exaggerated something a bit more odd erm static arches so as a eh typeface in
121	more recent years may have a curve the stem goes down you lift the pen then you
122	start the arch erm you with a static with a static so it has dynamics this is
123	going back to Hans Eduard Meyer's idea for erm Syntax there's dynamics movement
124	within the forms

4.3.3.5 Historical Immersion summary

The immersive and constant nature with which participants referred to history as both guiding and steering the potential direction of their approaches to design was evident across all of the collected data. Historical Immersion as a sub-category of Attenuating accounts for the ways in which designers not only to inform their design in relation to, and with respect to history but also affords the positioning of developing designs to align with or depart from such a sense of historical knowledge, determining a sense of progression in relation to history or distance and originality relative to the context of history. Participants utilize Historical Immersion to steer and position their design as part of an act of Attenuating incongruity in the development of the text typeface.

4.3.4 Envisioning

Envisioning is a contingent sub-category of Attenuating that describes the way in which the expert type designer's sense of self plays an important role in the development of design and designing generally. This includes awareness not only of what may be required to improve a typeface design but extends to developed and developing awareness of how approaches to designing may improve or be improved. Envisioning describes the designer's view of how they see themselves and their approaches to design as a contributing factor in the progression and improvement of design and designing. Envisioning compliments Historical Immersion in such ways that by Envisioning a designer may sense ways that they can bring about effective change within a design situation, drawing upon their own experiences, self-will or determination to bear upon design. Envisioning can be considered equal to situations where an expert designer recognizes their own expertise or virtuoso abilities in terms of self-will and how this may be applied to a particular design scenarios or to developing a sense of improvement in their own understanding and abilities as a designer based upon their envisioned skill, knowledge and experience of designing.

4.3.4.1 Experience and Envisioning

Expert text typeface designers utilize their awareness of experience as part of an act of Envisioning. In this respect, Envisioning experience allows the designer to make judgments with regard to the bounds or limits of what can, could and possibly should be achieved with regard to designing text typefaces. The expert's sense of self awareness of experience in terms of design and designing directly influences the act of Attenuating:

{Ref_Context}{Ref_Know_Hist_Cont}{Experience}
Extract 60 (RN_2, lines 320–321)

> '…well I suppose this is this is based around … experience of working with these things over many years…',

and:

{Ref_Context}{Ref_Know_Hist_Cont}{Experience}
Extract 60 (RN_2, lines 329–332)

> '…having a good appreciation of how typefaces are used as or should be used … so in the end the only judgment you can make is whether the typeface is fulfilling it's … role…'.

Knowing 'what' to or 'how' to bring about improvement is dependent upon awareness of the ability to identify where improvement is required and the ability of the self to bring about such improvement. This aspect in relation to text typeface design process is then very much dependent upon 'who' is involved in such activity:

{Collaboration}{Experience}
Extract 61 (CS_1, lines 238–241)

> '…I think that the fact that we were older and a bit more experienced when we started working together I think there weren't clashes of ego we knew that we both had the same goal in mind this is going to be a great typeface…'.

With respect to work of a collaborative nature, same or similar qualities of self in terms of experience and ability to attenuate may be shared between collaborators:

{Collaboration}{Experience}
Extract 61 (CS_1, lines 243–246)

> '…so if he's going to take the handful of letters I just drew and change them in some way because that makes it work better that's fine you know I found that … in some ways we get to the solution faster because you don't need to take as much time away to reconsider things…'.

The ways in which the designer engages in Envisioning their experience and ability, or in which they envision as similar in other's experience and ability impacts directly upon improving and progressing design and designing.

Extract 60

RN_2 {Ref_Context}{Ref_Know_Hist_Cont}{Experience}	
320	RN: (laughs) well I suppose this is this is based around experience of
321	experience of working with these things over many years but I mean as somebody
322	who's not judging the typeface then if they read the book and they don't have
323	any problems reading the book erm then in a way it's worked the typeface has
324	worked erm but even so even having said that I mean I I've recently read a book
325	that was I think it was set in a Garamond I can't remember which Garamond but it
326	was completely destroyed because it was too small a point size and too too much
327	line feed
328	MH: hm
329	RN: erm and it was just difficult to read because it was too small so this comes
330	back to having a good appreciation of how typefaces are used as or should be
331	used erm + (4 secs) so in the end the only judgment you can make is whether the
332	typeface is fulfilling it's it's + it's role

Extract 61

CS_1	**{Collaboration}{Experience}**
237	CS: I think our our relationship sort of fell into place relatively early I
238	would think when we were working on the Guardian project I think that the fact
239	that we were older and a bit more experienced when we started working together I
240	think there weren't clashes of ego we knew that we both had the same goal in
241	mind this is going to be a great typeface for this newspaper it's got to fit
242	their needs we don't each have grand statements that we need to make and and
243	have to go you know diva about it so a a good result and so if he's going to
244	take the handful of letters I just drew and change them in some way because that
245	makes it work better that's fine you know I found that in some way in some ways
246	we get to the solution faster because you don't need to take as much time away
247	to reconsider things and come to it with fresh eyes you can send it to the other
248	person who has fresh eyes already and they can pinpoint what's wrong with it fix
249	the weight thing or the proportion thing or the length of the serifs or whatever
250	wasn't working about it they can try another iteration bring it forward and then
251	you've got fresh eyes because it's changed

4.3.4.2 Envisioning a personal approach

Envisioning in relation to Attenuating also extends to ways in which experts project an envisioned personal approach to design. Awareness in this respect, manifests in the ways in which designers impose their own view of what it is that they as individuals bring to bear on the designing of type. This includes how they work in a particular way or have a particular view that is then imposed upon their consideration of design and designing. Experts demonstrate an awareness of ways of working or views they hold, particular to themselves that influence a general approach to Attenuating. The influence of a personal approach on Attenuating can manifest in ways in which design experts knowingly work within certain bounds or parameters:

{Ref_Know_Hist_Cont}
{Ref_Conv_Broad}
{Personal_approach}
Extract 62 (MC_4, lines 178–180)

> '… it's hard to … blaze a trail … where text typefaces are designed are concerned which departs very radically from … the familiar patterns…'.

Experts are thus able to exclude or dismiss other approaches, methods or considerations that for them, would appear to be less fortuitous or desirous in terms of the yield it will produce for design and designing:

{Tech_Constrain}{Repertoire}
{Personal_approach}{Ref_Own_Prior}
{Ref_Other_prior}{DesignSpaceID}
{PrimaryGen}
Extract 63 (ES_Int2_1, lines 123–125)

> '…drawing means drawing in my case pencil because I don't want it to be eh partly because I'm not quick on the screen so lack of practice partly I don't want to be slave to the curves…'.

An expert's personal approach in relation to Attenuating considerations of design and designing appears less like an applied dogmatic set of principles

but more of pragmatic consideration within the bounds of what appears conceivable:

{Ref_Know_Hist_Cont}
{Ref_Conv_Broad}
{Personal_approach}
Extract 62 (MC_4, lines 181–183)

> '…I suppose my frame of reference is … rather limited by … the constraints of what you can sort of get away with eh … in a text typeface design…'.

These are personal views experts evidence about themselves and their relationship to design.

Extract 62

MC_4 {Ref_Know_Hist_Cont}{Ref_Conv_Broad}{Personal_approach}

MC: yes I well + most of my work I suppose has been with text typeface not all of it by any means I mean I've designed some display faces and so on and I think you know the the constraints which we were talking about at lunch are more severe where text typefaces are concerned so you know it's never been my ambition to work on very experimental things I mean I the idea appeals to me and I I have a whole talk which I haven't given in some years I must look at it again on the history of experimental type design which is almost as old as the sort of authentic eh or orthodox I should say (inconical?) type design has a very ancient history and some of it has thrown up some interesting ideas an awful lot of it has just fallen by the wayside you know eh eh and along the way it just didn't appeal to anyone it was some particular person's weird idea and so on outside the outside the norms + so I suppose my frame of reference is is rather limited by by the constraints of what you can sort of get away with eh in in a text typeface design erm I would like to have been more adventurous in in in some of them but have perhaps to be so but erm it it's hard it's hard to erm to eh erm blaze a trail eh where text typefaces are designed are concerned which departs very radically from from the familiar patterns

Extract 63

ES_Int2_1 {Tech_Constrain}{Repertoire}{Personal_approach}{Ref_Own_Prior} {Ref_Other_prior}{DesignSpaceID}{PrimaryGen}

ES: with some physical constraints and then my method has always been eh to draw something from memory that I'm familiar with but draw it from memory and drawing means drawing in my case pencil because I don't want it to be eh partly because I'm not quick on the screen so lack of practice partly I don't want to be slave to the curves because the you have a Bezier curve a true type or an open type curve it has a certain you know you try to do it economically so you have very few points and they all all all the curves are looking the same

4.3.4.3 Envisioning and originality

Attenuating with respect to preexisting forms of type and approaches to designing type can be dependent upon the designer's ability to envision their own sense of originality. This aspect of Attenuating relates to ways in which the designer weighs-up or judges their own ability to make novel contribution to a design or the contextual culture in which they design, insofar that such a contribution will improve or enhance preexisting forms or methods. Envisioning a sense of originality may include the ways in which a designer perceives their contribution to the canonical body of existing material within their subject domain:

{FirstChars_lc}{FirstChars_Uc}{Ref_Own_Prior}{Proced_Dev}{Ref_Originality}
Extract 64 (GU_1, lines 83–85)

> '…I don't have to reinvent the letterforms completely I've done that a couple of times…'.

Envisioning originality in a methodological approach can include ways in which the designer views existing approaches as can be improved upon:

{PrimaryGen}{Proced_Dev}{Ref_Originality}
Extract 65 (MM_2, lines 205–207)

> '…I try to … convince people there's before that there is a stage which is much more important … so try to follow that path in general…'.

In contrast, designers may view a prospect as not being useful in terms of the potential to contribute originality or to bring about improvement within a preexisting area:

{Ref_Originality}{PrimaryGen}
Extract 66 (JT_2a, lines 486–489)

> '…you get told to … or asked or approached redraw Helvetica or something I said well why do you want to redraw it it's alright as it is and it's a soulless job anyway if you're going to do something you might as well do it new…'.

The ability to envision potential to contribute and improve in an original manner appears as an important element of Attenuating for the expert designer.

Extract 64

	{FirstChars_lc}{FirstChars_Uc}{Ref_Own_Prior}{Proced_Dev}{Ref_Originality}
GU_1	
83	I don't have to
84	reinvent the letterforms completely + I've done that a
85	couple of times

Extract 65

MM_2 {PrimaryGen}{Proced_Dev}{Ref_Originality}

MM: yes + so eh + it's almost like proving that eh not that I'm right but
trying to tell that what are all those people doing copying Akzidenz Grotesk or
Helvetica from each other again and again and again and why always slanted
for me it's like blind
copying of what's already there + and I try to to convince people there's before
that there is a stage which is much more important + so try to follow that path
in general you know it's like eh what I did with Scala the same I showed the
world that you have Scala first and from that you have the Scala Sans you could
also do it with Bembo or with eh like Jan Tschichold did with Sabon and he made
sketches for it Sabon Sans which were never it was never released but the path
is very simple and very obvious and very eh logic that eh not the other way
round of course

Extract 66

JT_2a {Ref_Originality}{PrimaryGen}

JT: you you you get told to told or asked or approached redraw Helvetica or
something I said well why do you want to redraw it it's alright as it is and
it's a soulless job anyway if you're going to do something you might as well do
it new erm and but then it's like market research the people who commission it
don't know they can't see what's new otherwise no one can you see ad no way very
rare will they give you gamble you you know give you lots of money to gamble on
making something new
MH: yes
JT: because the trust isn't there there's no sort of understanding the days of
Frank Pick and sort of commissioning the underground type and see what happens
kind of thing is long gone you know

4.3.4.4 Autonomy and overseeing in design

In order to progress and improve text typeface design, the expert typeface designer draws upon a strongly developed perception of the importance of autonomy in decision-making in design:

{ExampleExperi}{Redefining_brief}
{Autonomy}
Extract 67 (JFP_1, lines 78–79)

'…you need to have one designer to do everything…'.

The perception of autonomy in terms of a single designer's view, creating and progressing design may also extend to situations of collaboration. In these instances the autonomous perspective is still maintained as the expert designer establishes parameters or retains overall control:

{Autonomy}
Extract 68 (JFP_1, lines 83–85)

'…at some point you can ask another one to come … but later but one … so how the step is created…'.

The importance of a single overall view is maintained by the expert in situations where collaboration may appear as an ideal, however, pragmatism may dictate that an expert partner within such collaborations takes an autonomous role in progressing a design:

{Overseeing}{Autonomy}
{Collaboration}
Extract 69 (CS_2, lines 54–56)

> '…there's the idea always that you when you're collaborating on a typeface … you both want to be able to mess around with the full character set … and make sure it's what you're both thinking … find that middle point … but practical concerns mean that's rarely possible…'.

Similarly, where a type design involves a group of stakeholders, autonomy appears necessary with regard to overseeing the progression of the design:

{Autonomy}{Overseeing}
{Collaboration}
Extract 70 (RN_3, lines 139–140)

> '…I think it is important in a project that there is one person that has a responsibility for the design…'.

Envisioning autonomy for the expert designer then is necessary in order to enable the coherent progression of design.

Extract 67

JFP_1 {ExampleExperi}{Redefining_brief}{Autonomy}	
77	so + it's a joke
78	a little bit but + eh + you need to have one designer to do
79	everything

Extract 68

JFP_1 {Autonomy}	
83	JFP: Because it makes sense + at some point you can ask
84	another one to come to came but later but one + so how the
85	step is created
86	MH: So do you think is is that important maybe one person
87	to have an overall view
88	JFP: Yes + it is necessary to take the decision + but in
89	this case you see that + eh erm + the design involves some
90	strategy

Extract 69

CS_2 {Overseeing}{Autonomy}{Collaboration}

CS: well I I I we have a centralized drop box and I'll throw things in and I'll say Paul I need you to have a look at this I think these parts are good I think the italic's looking not too great yet so if you could do what needs to be done (laughs) eh that would be great but a lot of it there there is sort of the ideal way that you would like to do it where we each work on go over each stage of the project and and each have a go at it and the reality of deadlines and things means that erm sometimes I'll say I I don't have time to work on this project anymore for two weeks so can I just send you these things and you fill in all the characters and I will italicize it when you're done + so yeah unfortunately the practical concerns mean that there's there's not not really one way that things tend to get done a lot of it has to do with what's going on at the moment + erm +++ there's the idea always that you when you're collaborating on a typeface you you both want to be able to mess around with the full character set and and and make sure it's what you're both thinking find find that middle point erm yeah but practical concerns mean that's rarely possible

Extract 70

RN_3 {Autonomy}{Overseeing}{Collaboration}

RN: I think it is quite important I I've been through all the sort of scenarios in my time at Monotype erm I I've seen sort of committees put together to judge typeface the progress of a typeface erm and I seen individuals have the responsibility and so on and I think trying to design to satisfy a committee is never a good idea really erm it's hard enough sometimes you know when you've got a customer to satisfy erm and that customer often you know often you're dealing with people that don't really know are not really type people

MH: hm

RN: so they're not confident in making a judgment so they show it around to all the people that are involved in the project perhaps (laughs) and if if they're people that work in a bank you get all sort of strange comments and (laughs)

MH: I can imagine (laughs) yeah

RN: so I think it is important in a project that there is one person that has a responsibility for the design yes

4.3.4.5 Envisioning context and usage

Context plays an important role in Attenuating beyond knowledge of context purely in the sense of Historical Immersion:

{Projecting_user_usage}
Extract 73 (GU_1, lines 68–71)

> '…the most important thing in my thinking … when I think of type design immediately I form the image of someone holding a reading surface and reading intently…'.

Envisioning context accounts for the ways in which expert designers are able to Attenuate envisioned contextual scenarios in order to situate or

justify the context for which a developing design will fit to or against. Envisioning such contextual fit may derive from Attenuating purely practical or functional issues in relation to the developing typeface design and its proposed foreseen use:

{Ref_Context}{DesignSpaceID}
{DesDelimiters_Client}
{DefDesSearch}
Extract 71 (ES_1, lines 146–147)

> '…it's nothing to do with fashion it has to do with the physical … readability issues…'.

However, expert designers also able to envision themselves as users in terms of how a typeface may be perceived contextually when in used. Both the functionality of the type and the envisioned contextual perception of the type can be aspects that the expert designer finds themselves Attenuating:

{Ref_Context}
Extract 72 (JT_2c, lines 95–98)

> '…you are putting things into it which then aid it's readability if you like but the way it works in context … so I was looking at that and thinking well you can do like a Poliphilus and fake it up or you can work within the constraints of what you have now a days…'.

Envisioning context and usage sees the designer Attenuating – checking, testing, judging etc. – not only for the usability of a design but also its envisioned contextual acceptability in use:

{Ref_Context}{DesignSpaceID}
{DesDelimiters_Client}
{DefDesSearch}
Extract 71 (ES_1, lines 139–141)

> '…they don't want the serif they think the serif is old fashioned they want everything in sans even if you can't read the bloody thing…'.

Attenuating a balance between such oppositional factors is aided by the designer's ability in Envisioning contextual fit in terms of both functionality and contextual acceptability.

Extract 71

ES_1 {Ref_Context}{DesignSpaceID}{DesDelimiters_Client}{DefDesSearch}	
137	if you + I I
138	have this argument all the time with the engineering guys + at Bosch where we
139	did the typeface both the sans and the serif + they don't want the serif they
140	think the serif is old fashioned they want everything in sans even if you can't
141	read the bloody thing the annual reports you can't read shit but oh this serif
142	stuff yeck (dismissive gesture with hand) and then you tell that sans two
143	hundred years old and they don't want to hear that + no no no no this is modern
144	you know Arial is modern Avant Garde Gothic is even more modern + because it's
145	more modern it's more constructed they don't understand that it's boring that
146	it's nothing to do with fashion it has to do with the physical erm readability
147	issues and all the rest of it and tone of voice or what have you + so the
148	historical models if you look at why they existed in the first place look at
149	physical constraints technical constraints and a certain yeah and they have left
150	us with a taste that we do think serifs are bookish or magazine-ish and sans are
151	+ eh corporate you know it's it's may be rubbish but it does exist and prejudice
152	and as our mothers would say you know where there's smoke there's fire there is
153	something in it and you have to take it into account

Extract 72

JT_2c {Ref_Context}	
95	they are idiosyncrasies you're putting elements you are putting things into it
96	which then aid it's readability if you like but the way it works in context so
97	so I was looking at that and thinking well you can do like a Poliphilus and fake
98	it up or you can work within the constraints of what you have now a days and and
99	find a way of doing it erm now the way that I did that was + (5 secs) adding a
100	slight slope and it was an odd thing because it didn't work in some places

Extract 73

GU_1 {Projecting_user_usage}	
68	that's right that's the most important thing in my
69	thinking + when I think of type design immediately I form
70	the image of someone holding a reading surface and reading
71	intently

4.3.4.6 Reflection, Envisioning and Attenuating

For the expert text typeface designer Attenuating goes beyond solely working on a current or ongoing design. Active Attenuation by the expert of their own past work or the work of other designers allows for the opportunity to learn reflectively from experiences of designing and from the designs themselves. Learning from past experiences and developing

critical appraisals of incongruity in past design output enables the designer to envision where Attenuation in terms of new or future designs may be required:

{Ref_Own_Prior}
{Ref_Act_Design_learn}
{Ref_Reflection_learning}
Extract 74 (MM_2, lines 136–137)

> '…mostly it's like I did something here and I'm going to do it different here because I know it didn't work there … you know you learn from your own mistakes…'.

Attenuating existing work by means of identifying incongruity is important in terms of reflective practice for text typeface designers. This allows designers not only to reflect on past or current design but allows them to project or envision where and what they will attenuate in developing or future designs:

{Ref_Reflection_learning}
{Ref_Own_Prior}{Numerals}
Extract 75 (ES_1, lines 208–210)

> '…I used to have them exactly on the … x-height maybe a little above now I've put them way above a least by one stroke because I always find them too small…'.

The expert typeface designer envisions themselves as active agents in the process of Attenuating their work. In this respect it is not that designers are merely Attenuating design, but is dependent upon their insight, their reflection, their vision of what works and does not work gained with experience that enables them to attenuate to very exacting levels.

Extract 74

MM_2 {Ref_Own_Prior}{Ref_Act_Design_learn}{Ref_Reflection_learning}	
136	MM: mostly it's like I did something here and I'm going to do it different here
137	because I know it didn't work there + you know you learn from your own mistakes
138	of course + it's eh in Scala there's lots of mistakes I think eh I remember that
139	I wanted to make the oldstyle figures erm in the basic character set so if you
140	type you have the I was so busy with this idea I was so focused on this idea I
141	think I made the ascenders and descenders much too long the numbers too wide so
142	they stand out very much in the text in a way which was the blame I wanted to
143	extend them out like eh eh lining figures you know but now they stand out
144	because they are very big oldstyle figures that for me later I saw this and I I
145	realized these things I I tried in Nexis I corrected this sort of I made it in
146	the right proportions I think descenders and ascenders are not as long as the
147	letter descenders and ascenders the eh width is also not so wide + it's just
148	correcting what you made mistakes before

Extract 75

ES_I	**{Ref_Reflection_learning}{Ref_Own_Prior}{Numerals}**
204	there's more constraints there and I love that … you can have the up and
205	downs and I've done the semi-oldstyle figures and three quarter oldstyle figures
206	and I learnt when I did the first Meta oldstyles they were way too short too
207	small + they they should be higher and the same with caps eh low eh small caps
208	(unrecognizable word) I used to have them exactly on the eh on the x-height may
209	be a little above now I've put them way above a least by one stroke because I
210	always find them too small

4.3.4.7 Envisioning summary

The relationship between Envisioning and Attenuating sees the expert typeface designer identify themselves and their ability, skill and judgment as important to the ongoing development and improvement of a text typeface design. Moreover, this continual, critical concentration on improvement and development by way of reducing levels of perceived incongruity in design in turn informs and improves the designer's ability to design. The expert designer's sense of self is therefore important in the act of Attenuating, as it is dependent upon their perceived developed abilities in critically identifying and ameliorating incongruity that results in the kinds of high quality and contextually apposite artifice we associate with such expert designers.

4.3.5 Summary

The core category Attenuating describes the ways in which designers continuously and critically test and adjust for incongruity in developing text typeface designs. As a developed core category Attenuating includes the sub-categories Attenuation, Accretive Amelioration, Envisioning and Historical Immersion. Attenuating describes the on-going constant attentive and corrective nature of the designer's actions and decisions within the design process from the earliest stages of attending to the form or parts of form of single characters to testing contextually set text and typographic matter in order to determine the functionality, usability and acceptable contextual usage of the typeface. Attenuating is inexorably connected to both core categories Trajectorizing and Homologizing as part of the overall design process relative to text typeface design. Attenuating also describes

the designer's continual act of comparing, filtering, checking, correcting and adjusting in the design. Attenuating describes both the practical and the tacit in relation to how the text typeface designer perceives and judges appropriateness in terms of the functional and aesthetic qualities of the design throughout its development. The text typeface designer is involved the act of Attenuating at both micro and macro levels in the development of the typeface design. The corrective actions of Attenuating as a developed theoretical core category describes how the designer reduces disruption or noise in the system of design resulting in Attenuation. Attenuation is then conditional in so far that it becomes a condition of Attenuating. As a consequence of Attenuation, the subcategory Accretive Amelioration describes the consequential, continual improvement of text typeface design over time, through constant Attenuation facilitated via the testing of form and relative spacing. Incongruity becomes rarefied, the typeface thinned of distracting elements. The designers' reflexive ability in Envisioning problem and opportunity along with their critical sense of knowing and reference to known design and designing by way of Historical Immersion, enables and facilitates the steering and guiding of the design toward conclusion.

5.0 Discussion

Contents

5.0 Discussion

5.1 Introduction

This chapter brings together by discussion the developed core categories and their theoretical sub-categories from within chapter 4.0. It also reintroduces aspects from the literature relevant to the developed theory alongside additional references where pertinent or necessary.

This study focuses on the problem that has existed in terms of a lack of documented knowledge relating to text typeface design process. With respect to this, the research question – Can knowledge of text typeface design process be revealed and if so can this be explicated theoretically? – was developed. One of the aims of this research was to evaluate whether it is possible to provide evidence and theory of such process if discernible from accounts of practice given by expert text typeface designers. Experts were chosen as the focus of this research as their accounts might give deeper insight into the processes involved. A Grounded Theory Methodology was adopted as this research methodology would allow for the generation of theory in an area where there was little in the way of substantive research regarding the process or processes of text typeface design. Grounded Theory Methodology often finds application where little exists in terms of explaining what happens in these areas (Goulding 2002). Although research has been established in the areas of design process, particularly in other subject fields such as architecture, industrial design, product design and engineering design etc. to apply this thinking directly to text typeface design to begin with would have been to make assumption with regard to the processes of text typeface design as being similar to other fields when there is no substantive study that establishes such connections. In depth interviews with experts provided the rich primary data that was coded and analysed by constant comparative method in accordance with Grounded Theory Methodology. This was conducted with the aim of generating theory that would describe patterns of commonalities and differences in the accounts of text typeface design practice as evidenced by the expert participants.

The Grounded Theory that emerges from this research provides rich and in-depth explanatory theory that addresses issues raised in terms of the identified knowledge gap within the aims of this research. The three developed core categories **Trajectorizing**, **Homologizing** and **Attenuating** provide a rich elucidation of the deep structures that exist in relation to the processes of text typeface design.

The aim of this chapter therefore, is not only to broaden out into discussion the Grounded Theory developed within this research and the interrelationships of the core categories pertaining to this, but also to offer discussion as to the implications and possible applications of the Grounded Theory.

A developed Grounded Theory is by its nature internally self-validating, in that it develops over time via the constant comparison of emerging concepts developed from and grounded in the data – the testimonies of the research participants. Glaser describes this as:

> GT is induction, systematically generating concepts from systematically collected data – evidence – based on a unique methodology of constant comparison procedures, which constantly verifies validity of concepts as they are generated from data and related to each other as hypotheses. (Glaser 2003, p.129)

The Grounded Theory in this study then, can be described as a series of hypotheses developed as inductively generated concepts from the data and grounded by the data. This study in accordance with Grounded Theory Methodology generates substantive theory as hypotheses. That is to say, this study is not one of verification of existing theory or the further development of existing substantive theory toward formal or grand theory. However, this chapter offers by discussion and example how the concepts generated in this study as Grounded Theory inter-relate and extend explication of the generated theory in the preceding chapter.

This chapter will discuss the inter-relationship between major elements of three core categories: Trajectorizing, Homologizing and Attenuating.

Each core category renders explanatory theory that elucidates groups of actions, thinking and behaviours relative to the processes of text typeface design as evidenced in the primary data by text typeface design experts.

The core categories are presented within this research in order to give clarity to the underpinning deep structures within the processes of text typeface design. This chapter will include the use of diagrams and images where these help elucidate, clarify and extend the discussion of the developed theory. Example of designed output from Empathic Memoing (see Chapter 3.0, section 3.7.2) exercises will also be included where this will help give clarity and structure to the discussion. Aspects of the developed theory relative to the literature with respect to typeface design will also be discussed.

This chapter also discusses aspects of the developed theory in relation to the wider context of the literature relating to design process and where pertinent beyond this.

Finally, this chapter will discuss the implications of the developed theory as a model in relation to the practice of typeface design, the theory in relation to the teaching of typeface design as a model of understanding process and the theory in relation to research as a model for analysis.

5.2 Interaction of the core categories

This section will further elaborate upon the developed theory by discussing the interrelationships between the core categories. Figure 5.2.1 is reintroduced here to re-familiarise the reader with the structure and relationship between the three core categories. This takes the form of an Euler diagram, representing the relationship between the core categories Trajectorizing, Homologizing and Attenuating. This diagram also visually expresses the concept of Attenuating as having an enduring nature in terms of the overall process of text typeface design in relation to both Trajectorizing and Homologizing.

Figure 5.2.1
Relationship of core, causal, action categories linking Trajectorizing and Homologizing relative to Attenuating.

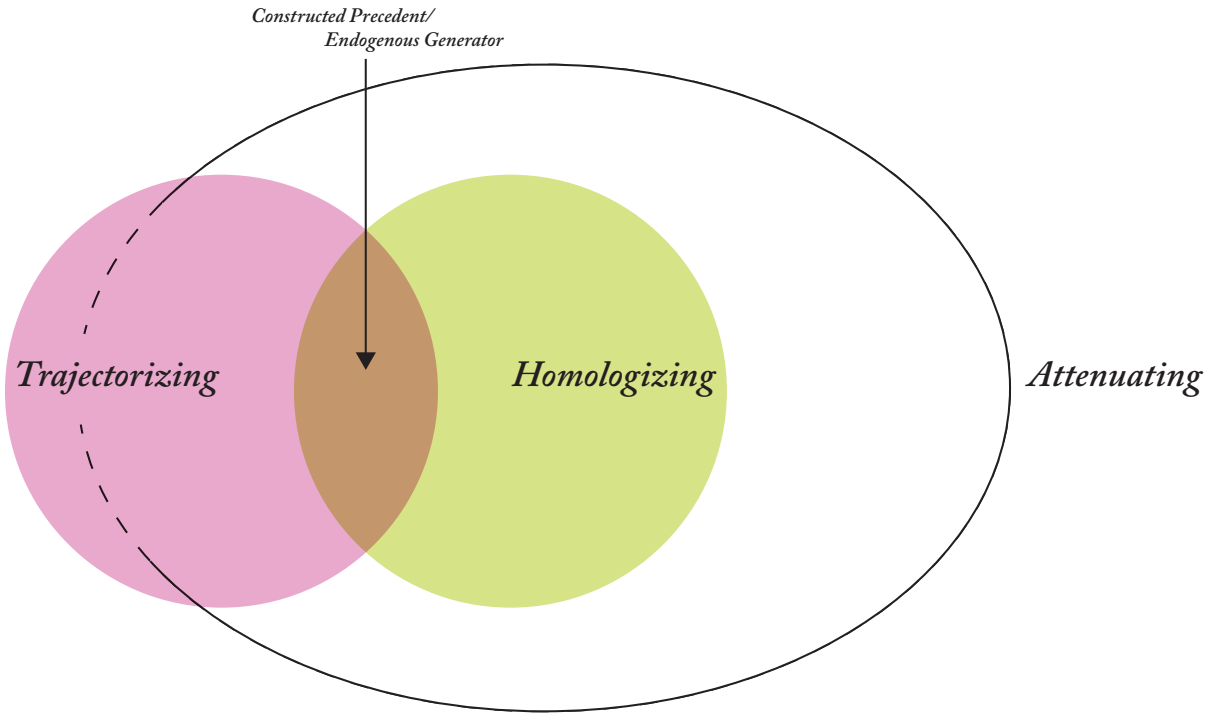
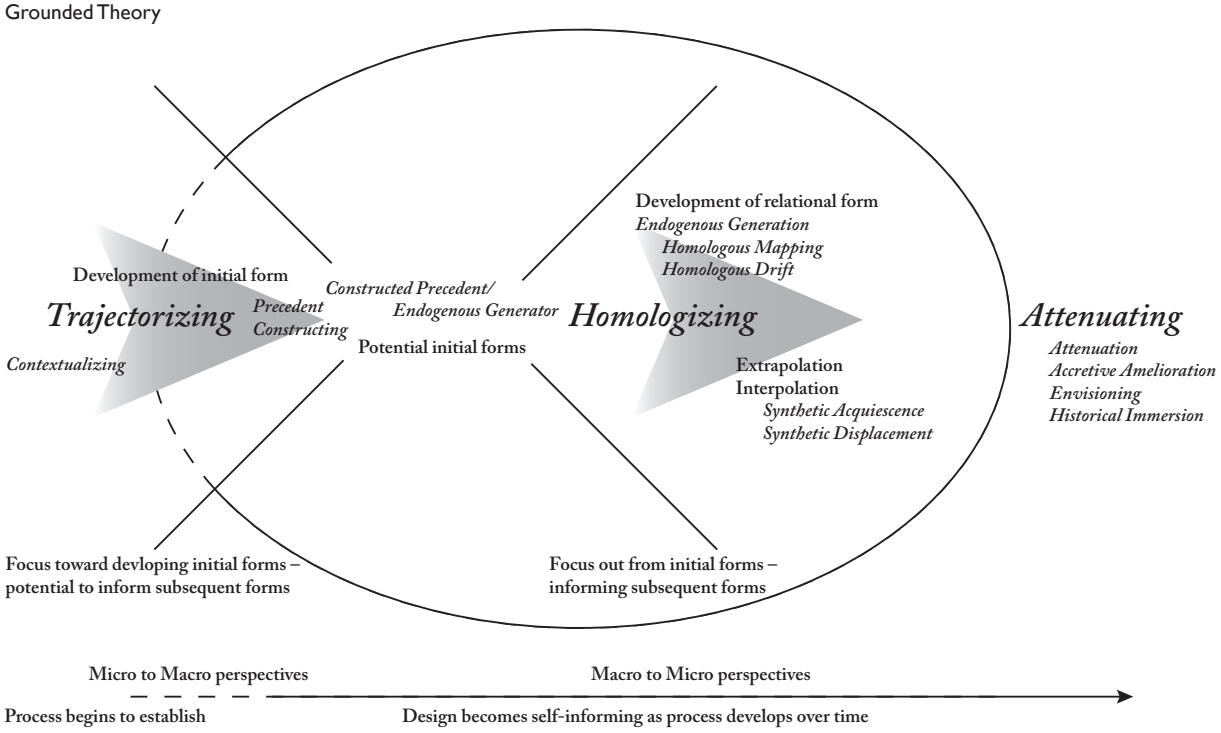


Figure 5.2.2 develops the simple Euler diagram, conceptually representing the same interrelationships between core categories but expanded with further detail with respect to the sub-categories and dimensions developed in this study. This diagram also represents the nature of the type design process over time relative to the inter-relationship of the core categories Trajectorizing, Homologizing and Attenuating. Highlighted is the shift that takes place in terms of the focus from micro to macro perspectives that inform and allow the text typeface design to control and navigate the development of design. It can also be noted the significance of Attenuation as a core category in relation to Trajectorizing and Homologizing. Whereas Trajectorizing and Homologizing actions have definitive and arguably, delimited roles within the development of text typeface design, Attenuating has an enveloping quality, that can be seen as constantly present throughout the process of text typeface design.

Figure 5.2.2
Typeface design process relative to core and sub-categories, including related phenomena as described by the developed Grounded Theory



5.2.1 Attenuation as constant

Expert text typeface designers engage in critically assessing the needs, potential and opportunities of text typeface design from its very early stages continuously through to its completion, release or capitulation. Even after completion of a design, identification of incongruence is still possible:

> '…so you know so everything … I've been involved with I think there were probably areas that could be improved…'.

{Improvement}{Ref_Own_Prior}
{Ref_Act_Design_learn}
{Ref_Reflection_learning}
Extract 76 (RN_2, lines 260–261)

Attenuation goes beyond the process of design. Incongruity may still be identified within a design even when the designer has decided that the point has been reached when the design work must stop.

Extract 76

RN_2 {Improvement}{Ref_Own_Prior}{Ref_Act_Design_learn} {Ref_Reflection_learning}	
257	RN: (laughter) yes I mean I I think there's precious little that I'd feel fully
258	satisfied with + erm but in a way I think that if you work in a sort of creative
259	environment if if you are totally happy with everything you do you sort of loose
260	the momentum a bit somehow it (laughs) so you know so everything I I've been
261	involved with I think there were probably areas that could be improved (laughs)

The designer attenuates incongruity in relation to Trajectorizing new form and also in Homologizing based on subsequent generated form. Any seemingly incongruent element can be identified as well as adjusted or improved. However, when a design has come to the point where it is deemed finished or complete, Attenuating may still take place in the form of identifying incongruity in a design, even if the designer does not attenuate such incongruity in terms of remedying:

{Des_Prob_Inherent}{Ref_Other_prior}
{Ref_Own_Prior_NEG}{Ref_Own_Prior}
{Corrective_Judgment}
Extract 77 (MC_3, lines 149–151)

'…I could probably find some things that I thought ah you know I wish I'd not done that and so on but I I wouldn't change it at this point…'.

Attenuating, then, can be seen as a constant feature of text typeface design as relating to expert designers. To be effective, Attenuation requires firstly comparison and secondly expectation in order to be effective. The level and success of Attenuation identified as necessarily required and achieved will be dependent upon the ability, knowledge and skill of the designer.

Extract 77

MC_3 {Des_Prob_Inherent}{Ref_Other_prior}{Ref_Own_Prior_NEG}{Ref_Own_ Prior}{Corrective_Judgment}	
148	don't often eh eh no I mean + you know I I'm not really tempted I'm sure if I
149	sat down with you and we looked at you know Galliard or something or other I
150	could probably find some things that I thought ah you know I wish I'd not done
151	that and so on but I I wouldn't change it at this point

5.2.1.1 Attenuation and comparison

Comparison for the text typeface designer is requisite. This is often simultaneously multivariate, requiring comparison at many levels from micro to macro and back again. Text typeface designers appear not to create leaps in terms of the notions of solving problems as described by Cross, Chritiaans et al. (1996). The text typeface designer appears to resolve a design

via constant Attenuation rather than by solving a design scenario:

{Working_Phase}{Testing}
{Ref_Context}{Proced_Dev}
Extract 78 (MC_1, lines 400–401)

> 'this…very long winded process of changing something and seeing the effect and may be makes it worse so you undo that and you go and change something else…'.

Many of the issues that text typeface designers face are, at least by expert testimony, well known to them, issues such as readability, legibility etc. which are inherent in the nature of what a text typeface design requires. However, each text typeface design will have its unique and particular inherent sets of tensions also. Such tensions appear to emerge and resolve through the processes of design as opposed to being solved. Text typeface designers go beyond mere conjecture in the initial forms they establish, they trajectorize, they lay down early precedent for themselves to follow, they attenuate form by means of continual generation and testing – perhaps a high frequency or micro version of the kind of generation and test identified by Newell & Simon (1972) – that may be found in other design discipline studies. Attenuating begins very early in the process of text typeface design:

{Mutability}{Ref_Context}{Testing}
{Proced_Dev}
Extract 79 (MM_2, lines 48–49)

> '[testing begins] almost immediately … if you have … n and an i and m you type nim …'.

and is intrinsic to both Trajectorizing and Homologizing, Attenuating being the constant sets of awareness and actions that filter, check and amend – Attenuating incongruity in the sense that the expert designers see this. Here there is something like the nature of what Christopher Alexander describes in ideas of fit and mis-fit in relation to examples of extended learning: 'The most important feature of this kind of learning, is that the rules are not made explicit, but are, as it were, revealed through the correction of mistakes' (Alexander 1974, p.35).

For the text typeface designer this perhaps connects to a process of learning also but the immediate similarity here is in the ways in which designers describe the actions of constant critical testing and identifying what they see as not working or incongruent. Attenuating leading to accretive improvement, but improvement 'revealed through the correction of mistakes', or more correctly improvement through the sense of the filtering of incongruity – Accretive Amelioration.

Extract 78

MC_1 {Working_Phase}{Testing}{Ref_Context}{Proced_Dev}	
400	this + very longwinded process of changing something and seeing the effect and
401	may be makes it worse so you undo that and you go and change something else

Extract 79

MM_2 {Mutability}{Ref_Context}{Testing}{Proced_Dev}	
48	MM: eh almost immediately + yeah eh if you have a eh n and an i and m you type
49	nim + (smiles) just to eh automatically you just do it you know so or if you
50	make the n and the m you cannot make a word so you you then start making the o
51	or the e just to have something you know

5.2.2 Trajectorizing and precedent

The Grounded Theory developed in this study highlights the importance of the role of precedent in the designing of text typefaces as a Trajectorizing element. It is important to note however, the distinction that this study gives in terms of two main kinds of precedent in connection with text typeface design. These are contextualising precedents and Constructed Precedents. To clarify, a contextualising precedent is one (or multiples of) that the designer may select either consciously and purposefully or by serendipity as the influence or basis upon which a text typeface will begin:

{PrimaryGen}{Ref_Other_prior}
{DesignSpaceID}
{Ref_Act_Design_learn}
Extract 80 (MC_1 lines 83–86)

> 'I mean that that is how I educate myself about something you know here's a nice typeface I've got a reasonably good specimen of perhaps most of the alphabet and so on let me scan it and put it in the background and eh and work over it and see where it takes me…'.

Extract 80

MC_1 {PrimaryGen}{Ref_Other_prior}{DesignSpaceID}{Ref_Act_Design_learn}	
83	MC: I mean that that is how I educate myself about something you know here's a
84	nice typeface I've got a reasonably good specimen of perhaps most of the
85	alphabet and so on let me scan it and put it in the background and eh and work
86	over it and see where it takes me

The employment of precedent in design process has been well documented and commented upon by others, eg. Goldschmidt (1998). A designer may use an initial precedent to work along with as a guide and then depart from this. However, Goldschmidt's view that '…the use of precedent is

counterproductive with respect to design creativity…' (Goldschmidt 1998, p.258) and:

> …using past examples is a relatively straight forward problem in cases of routine, non-innovative design. When we consider non-routine, innovative and ultimately creative design, the problem increases manifold. (Goldschmidt 1998, p.260)

Such views do not align clearly with the way in which expert designers in this study evidence the use of known and found sources, typologies etc. as impetus for initiating or targeting their own designs early in the process.

In terms of what this study identifies, these initial kinds of precedent can be seen as contextualising precedents in terms of text typeface design, the like of which have been discussed and identified before with either seemingly positive or negative connotation depending upon the individual researcher's point of view eg. Goldschmidt (1998). However, this research also identifies precedent that functions in a very different manner as to the kind described above. Goldschmidt's description of precedent (1998, p.262) also falls short of deeply examining parallels between precedent in law and how this may give insight to describing the use of precedent in terms of design. This second kind of precedent is named in this study as a Constructed Precedent. A Constructed Precedent is one where the designer develops form as a rule or guide in order that such form will have an influence on the design that is to be developed. In this respect, form is developed as a rule or guide that the designer sets in order that they will subsequently use and follow themselves:

{Mutability}{SystemNotion}
{FirstChars_lc}{Letter_parts}
{DesignSpaceID}{Proced_Dev}
Extract 81 (JFP_1 lines 325–337)

> '…the n is the basis of the most bigger group of letters … you have the m you have the u … you have the way that you have the stem with curve on this part on the top or sometime on the bottom … you connect to a curve you connect to a stem its something that is everywhere on the typeface…'.

The example in Extract 81 illustrates the expert participant describing the importance of specific aspects of form within the lowercase n and how these act as Constructed Precedents for subsequent letterforms.

Extract 81

JFP_1	**{Mutability}{SystemNotion}{FirstChars_lc}{Letter_parts}{DesignSpaceID} {Proced_Dev}**
325	JFP: For, for, for everything + because the n is the basis
326	of the most bigger group of letters + you have the m you
327	have the u + you have the way that you have the stem with
328	curve (gestures with hands to form an upright motion and a
329	connected curve motion) on this part on the top or sometime
330	on the bottom + you connect to a curve you connect to a stem
331	its something that is everywhere on the typeface. On the
332	bottom of the a on the a on the a lowercase (gestures again
333	to form the shape of a lowercase a) you have the a is there
334	(gesture to form the curve at the bottom of the lowercase a)
335	so is as the same things as on the u or on the top of of the
336	n so + this is a crucial decision + because if you have the
337	top of the n

Extract 82

JT_1a	**{Des_Macro}{Des_Micro}{FirstChars_lc}{Ref_Own_Prior}{Proced_Dev} {Working_Phase}{SystemNotion}**
422	ah this'll do ah this is Kingfisher + now this will will have
423	had a eh erm + this had a very long gestation period + right so this + ok + this
424	these aren't dated but these are pretty much + earlies this is erm Enigma on the
425	bottom and this is literally just very first sketches so this is the kind of
426	thing I will start with an l an n an i and an h whatever and this case very
427	simple because that's a variation of that the l's a variation of that the dots
428	you know just shorten that down and bung the dots on it so it's very easy

Figure 5.2.2.1
Video still from interview in relation to Extract 82

Extract 82 illustrates the participant describing the connection between initial letterforms in terms of Constructed Precedents leading to Endogenous Generation, Homologizing initial trajectorized form:

{Des_Macro}{Des_Micro}{FirstChars_lc}
{Ref_Own_Prior}{Proced_Dev}
{Working_Phase}{SystemNotion}
Extract 82 (JT_1a lines 426–428)

> '…I will start with an l an n an i and an h whatever and this case very simple because that's a variation of that the l's a variation of that the dots you know just shorten that down and bung the dots on it so it's very easy…'.

Figure 5.2.2.1 shows a still from the video footage of the interview corresponding to Extract 82 [time 00:33:50]. The video still shows the participant using a laser-proof from a previously designed text typeface to describe how initial forms are developed early in the process of design which are then subsequently used as the basis to generate further forms.

This distinction in the form of two kinds of precedent may be seen as something closer to the description of precedent in law as given by Siltala when describing terms of rules and principles such as 'precedent-identification and precedent-following' (Siltala 2000, p.59) that may lead to 'precedent-norm formation' (Siltala 2000, p.59). Siltala describes difference between two forms of precedent-norm, those that are formal '…follow the binary code of an on/off, all-or-nothing, or either/or type…' and less formal '…follow the "logic" of a graded code with more-or-less type of reasoning…' (Siltala 2000, p.60). What Siltala goes on to explain is that whereas the formal 'binary' precedent is of the fixed variety, the less formal precedent is subject to be 'modified' (p.60). Siltala later explains in terms of precedents that are open to being modified that:

> …practice of 'adapting and altering' a precedent, with an eye on the needs of the new context of adjudication, is in perfect accord with judicial revaluation… (Siltala 2000, p.125)

This view of precedent in light of the testimonies of designers in this research, goes some way to help draw distinctions and explain what appears in terms of designers not only selecting and following precedent, but actively modifying and setting new precedents for themselves to follow for the purpose of designing form subsequent to initial trajectorized forms. Again with reference to the expert practice of law and working with precedent,

Michael J. Gerhard argues that:

> When people steeped in law become public authorities, they enter office prepared to learn from and to justify actions in terms of precedent. They appreciate that precedent-based arguments are an important stock in trade and are aware that a natural part of their job is constructing precedents. (Gerhard 2008, p.148)

These parallels then appear to have much closer fit to the notion of precedent with respect to text typeface design. The Trajectorizing action of Precedent Constructing by the text typeface designer can be seen as imbuing the initial designed letterforms with potential to inform the developing design, design that is informed by a wealth of 'steeped' knowledge or rather Historical Immersion.

Figure 5.2.2.2 shows a lowercase n developed as part of an Empathic Memoing exercise in which the author produced the design in order to gain further clarity – to empathically understand – what was being evidenced in the primary data with regard to the concept of Precedent Constructing. The author recorded whilst designing, where decisions where made with regard to elemental, component form that makes up the design of a lowercase control character, in this example the lowercase n. The diagram highlights typical design decisions that could lead to the development of component Constructed Precedents, the likes of which that would have potential rule or influence over subsequent forms within a developing text typeface design. The diagram also includes a list of the individual elements and considerations produced by means of the author's Empathic Memoing that can be considered as Constructed Precedents.

Empathic memoing:
Decision-considerationfor initial lowercase n (precedent construction memo)

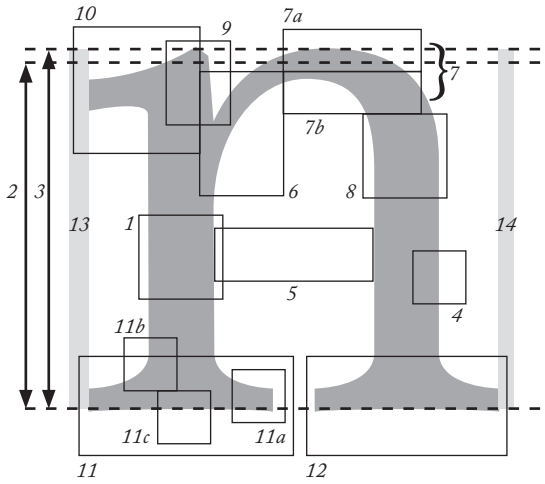


Figure 5.2.2.2
Empathic memoing used to simulate decision considerations within the initial stages of the type-design process for a serif typeface, with the lowercase n letterform as a starting point. Here conscious decision-making factors are highlighted and numbered. These pertain to general but non-exhaustive decisions that will have impact on the development of subsequent letterforms – elements of the lowercase n become 'Constructed Precedents'.

N.B. it should be noted that this is an empathic memo of designing and related thought toward decision making, not merely a diagram of the named parts of a letterform, the likes of which may be found within popular textbooks etc. on the subject of type and typography.

Typical non-exhaustive decision consideration for lowercase n (precedent construction memo)

1 *Stroke/stem width*

2 *x-height relative to baseline*

3 *Extention beyond x-height for curved elements etc. (over-shoot)*

4 *Quality of outline (smooth, rough etc.)*

5 *Width of counter (frequency between uprights)*

6 *Connection of curve to upright/width of Thin stroke/height of join relative to upright*

7 *Modulation of curved stroke (stress)*
- ***7a*** *Attributes of outside curve (position of curve peak – throw, relative to uprights)*
- ***7b*** *Attributes of inside curve (static/dynamic arch)*

8 *Connection of curve to upright/width of Thick stroke/height of join relative to upright*

9 *Attributes of top of terminating upright relative to curve (cut-in etc.)*

10 *Attributes of top serif (flag serif etc.)*

11 *Serif style/kind*
- ***11a*** *Termination and depth of serif*
- ***11b*** *Attributes of serif join*
- ***11c*** *Attributes of serif base (flat, cupped etc.)*

12 *Serif length/position left and right*

13 *Left side-bearing (spacing)*

14 *Right side-bearing (spacing)*

The notion of identifying the importance of elemental form in early stages of typeface design is inferred by W. A. Dwiggins in his letter to Rudolph Ruzicka (1940) with regard to experimental letter for his Falcon type. Although this example gives useful insight into the process of how Dwiggins used cut celluloid film to build letterforms from component parts in a stencil-like manner, it also infers something of a potential system that would be one of homogeneity rather than of homology. Figure 5.2.2.3 shows Dwiggins' illustrations depicting his system of letter parts. By way of using the developed theory in this study as an analytical tool, it can be argued that this example by Dwiggins displays a clear example of Precedent Construction.

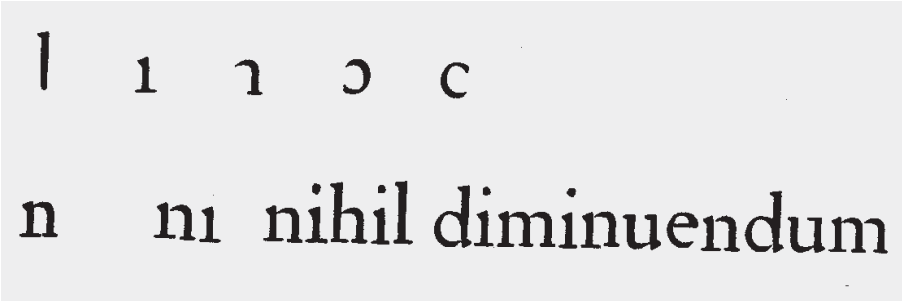


Figure 5.2.2.3
Dwiggins's Falcon type experimental letter parts. Top line shows the elemental component parts. Bottom line shows the combining of parts to create letterform.

However, this study also evidences that designers describe subtlety and mutability as important considerations in the development of type-forms. It is the experts' evidencing, the coding and raising of the category of Mutability in the comparative analysis, that then transforms what otherwise might be considered the straightforward replicating or repeating of component form as homogenizing of letter parts, to become a process of Homologizing form.

5.2.3 Trajectorizing for subsequent Homology – initial control characters

The initial characters that expert text typeface designers produce, sometimes referred to as 'control characters', offer ways into the process or sequences of design for the expert. Participants in this research related using or starting with different letterforms, however, the lowercase n appeared frequently referred to within the primary data. As was outlined within the Literature Review 2.0 of this research, little exists previously in terms of the insights

into the process of text typeface design. There are glimpses however within some texts such as that of Dwiggins (1940) mentioned above and Goudy (1940) where the choice of initial letters in establishing a design are mentioned 'I usually draw two lower-case letters, a p and an h…' (Goudy 1940, p.82). He also gives some insight as to why he begins with a lowercase p 'My drawing of the lower-case p permits me to strive for a movement in the round member – a movement that I attempt to retain throughout the face…' (Goudy 1940, p.83). In relation to the drawing of these initial letters, Goudy goes on to mention considerations that he gives:

> How shall the joining of the curve to stem at top and bottom be made, what thickness of serif, and what shape? If the face is to be 'old style', the decision with respect to relations and stress is partly settled already, and if it is to be a 'modern' face, while a different treatment is called for, the same points are also more or less settled in advance…
> (Goudy 1940, p.83–84)

In light of the developed theory within this research it can now be seen that this can be used as an analytical tool to explain what the likes of Goudy have mentioned in glimpses within the extant literature. In discussing the rounded bowl of the lowercase p, Goudy is describing Trajectorizing form that will lead to subsequent Homologizing of form '…a movement that I attempt to retain throughout the face…'. Decisions with respect to Precedent Construction are also given in Goudy's statements above, '… joining of the curve to stem at top and bottom…', '…thickness of serif…' and '…old style…' etc. These kinds of decisions that are made early in the process are made not only in and of themselves, but are made in order to lay down rule and guide for the text typeface designer as a basis to work from '…more or less settled in advance…'. With respect to initial characters within the design process, contextualised precedent may be used to set the style of a typeface design, whilst Constructed Precedents in the form of the component or vestigial forms within an initial letterform set the patterns from which designers will subsequently generate later homologized form. The theory developed in this research is able to explain and elucidate what previously may be considered tacit or esoteric descriptions or insights to process. To return to Goudy again:

> From humble beginnings I progress step by step, working back and forth from one letter to another as new subtleties arise, new ideas to incorporate, which may suggest themselves as the forms develop, until finally the whole alphabet seems in harmony – each letter the kin of every other and of all. (Goudy 1940, p.81)

What Goudy describes in the statement above is Trajectorizing form and via subsequent Homologizing and constant Attenuation of developing form, the completion of a design that harmoniously [congruently] self-informs. It can be seen then that the theory developed in this research from the primary evidence of expert design participants can also be applied to the descriptions of process of text typeface design found within extant texts. The value of this is two-fold, as it not only provides a model for the analysis of such descriptions but also facilitates explication of extant examples of description in order to go beyond the personal, tacit and esoteric. The theory developed within the research allows for the identification and categorization of existing descriptions and of personal accounts of process. This will help in the development of further research within the area of typeface design as the theory gives a basis upon which comparative studies can be made between designing differing forms of typeface design, for example non-latin, display type design etc. It also gives identity and language to identified actions and decisions text typeface designer make, this has potential to inform the orientation of future protocol studies where the focus would be analysing specific aspects identified by the developed theory in this research. In turn, development of research in the area of typeface design will lead to comparing knowledge, practice and processes across differing domains and disciplines of design.

5.2.4 Trajectorizing and search space

In relation to previous studies and descriptions that have focused on the way that designers negotiate initial approaches to design, these often make connections viewing and describing designing and problem-setting/problem-solving. In relation to studying the ways that designers negotiate initial approaches to design, Omer Akin (1986) described models of search

specifically in relation to architectural design. Akin describes search methods such as depth-first search (focus on details of design and designing) and breadth-first searches, that designers may adopt in order to negotiate problems in design and designing, relative to what and how to approach design by matching these against a priori or archetypal solutions (Akin 1986, p.90–93). Akin commentated that:

> The advantages of breadth-first search over depth-first search are largely a result of the greater likelihood of finding a solution in a shorter time, especially when there is a large repertoire of prototypical solutions available. (Akin 1986, p.93)

In terms of a general comparison, this may be seen as similar in the ways that text typeface designers work between micro and macro levels of attendance in designing. However, it can be argued, for the text typeface designer, many of the variables that may be considered relative to problem setting or narrowing search space, are intrinsic in the nature of designing text typefaces, eg. letterforms must conform to certain given norms in terms of form, they must also be legible to work at particular sizes etc. That is to say, to some extents, the parameters of what a design will need to fulfil are in many ways already predetermined or self-fulfilling – in order to be a text typeface design the design must function as a text typeface. The problem is self-evident yet paradoxical. Participants in this study described varied approaches to the very early stages of design. These were evidenced as similar to breadth-first approaches in terms of the purposeful selection of contextualising precedents and typologies etc. However, designers in this study also evidenced similar depth-first approaches where a micro-level detail may be the focus of initial attention eg. serif detail. Where there appears to be little relation what Akin describes however, is in that the notion of 'finding a solution' (Akin 1986, p.93) appears less obvious for text typeface designers. The notion of initial search space as far as this research is concerned, is rather more aligned to the concept of the designer aiming along a path, or at a target, whilst developing potential or momentum to continue along such paths, or find such targets – Trajectorizing – as opposed to problem-solving. The notion of a target in terms of context may be similar to what Schön describes as 'framing' in terms of problem-setting (Schön

1991, p.41). Text typeface designers may clearly initially contextualise their search space or frame of reference at the outset of the process. However, text typeface designers in this study also evidence developing such context through the process of designing itself. In this sense, the path or target emerges as a result of and along with the initial design activity. What Schön does offer as useful to consider here in relation to notions of framing, problem-setting, problem-solving and search space is:

> When ends are fixed and clear, then the decision to act can present itself as an instrumental problem. But when ends are confused and conflicting, there is as yet no 'problem' to solve. (Schön 1991, p.41)

He continues:

> It is rather through the non-technical process of framing the problematic situation that we may organize and clarify both ends to be achieved and the possible means of achieving them. (Schön 1991, p.41)

In terms of the statements above and in relation to the concept of Trajectorizing, text typeface designers describe working in such ways that context can either be clearly defined in the initial stages of design or this can emerge along with the initial design. In this sense the notions of problem-setting and problem-solving are not always as clearly apparent as may be articulated in other areas of design. Certainly, the notion of the 'problem' was not always clearly evident in the testimonies of the type design experts. Schön's notion of framing does appear to have some relevance with respect to the initial stages of text typeface design as far as the phenomena of Contextualising the initial design is concerned. That is to say, helping shape the path or target initially. This initial contextualisation however, may emerge with the initial design activity as opposed to enabling the setting of the initial design activity. Trajectorizing may have greater similitude then with Christopher Alexander's notions of 'fit' in the respect that context and form are simultaneously independent and interdependent. He offers that:

> …every design problem begins with an effort to achieve fitness between two entities: the form in question and its context. The form is the solution to the problem; the context defines the problem. (Alexander 1974, p.15)

However, although this description has some degree of resonance with the descriptions the participants in this research gave with respect to the initial stages of design, the notions of problem and solution do not clearly align with testimonies in the primary data. In terms of Trajectorizing, what text typeface designers evidence is something more akin to context and positioning in relation to their descriptions of design and designing. Aligning with selected, given, identified or developed contexts in opposition to problematizing the notion of context.

5.3 A general model for text typeface design process

This research determines that within the initial stages of text typeface design there can be many factors that initiate the process of design from the purposefully selected contextualising precedent to ideas and concepts that develop serendipitously. Designers might instigate the process themselves or receive requests to design a typeface. It has been established within the Grounded Theory that contextualising precedents also play an important role in the initial development of text typeface design. Again, this can be in the form of a singleton precedent or may consist of multivariate precedents. These too can be selected purposefully or derived serendipitously via knowledge and experience.

There is however, a point early in the process of text typeface design that design experts will focus on the designing of the physical form of the type itself, as opposed to outlining the contextual search space that a design will occupy or initially occupy before developing further. At the point when designing the initial characters for the typeface design begins, a discernible pattern of decisions, actions and behaviours is identified in this research as outlined in the Grounded Theory chapter 4.0 etc. From the developed theory, patterns of process can be mapped in the form of algorithmic flow diagrams. Routine and sub-routine mapped against the categories of the theory. Process for text typeface design can be elucidated in such a manner that visual diagrams describe the deep patterns of design behaviour that account for the individual core categories Trajectorizing, Homologizing and Attenuating and the relationship between these three categories.

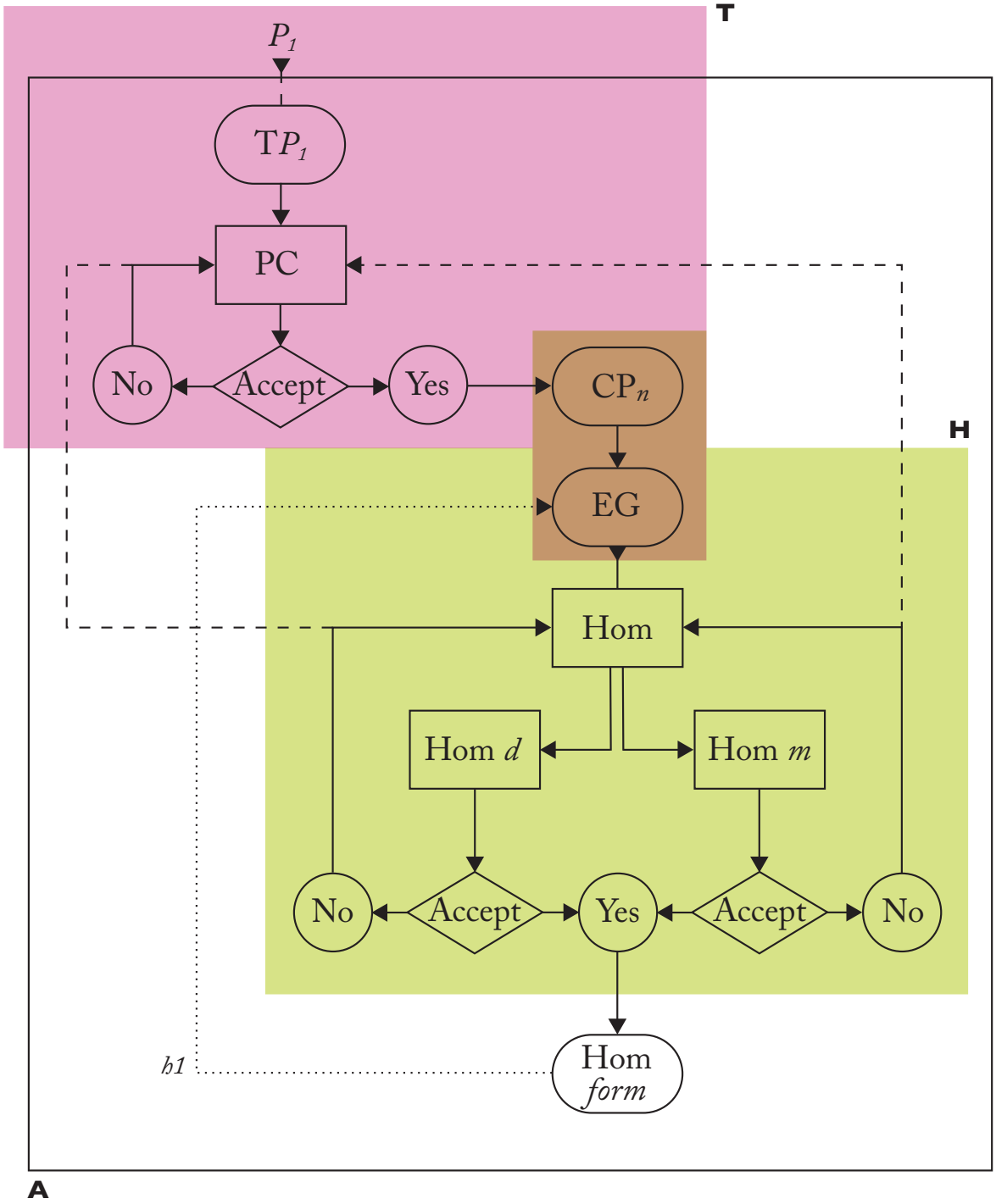
A further detailed algorithmic flow diagram is presented in this discussion that represents the process(es) of Extrapolation and Interpolation.

5.3.1 General flow model for text typeface design process

The three core categories developed within this research, Trajectorizing, Homologizing and Attenuating can be represented in terms of their inter-relationship relative to the process(es) of text typeface design. Figure 5.3.1.1 shows a flow/algorithm for the relationship of Trajectorizing (T), Homologizing (H) and Attenuating (A). The labelled bounding boxes represent the three core categories. The flow/algorithm diagram can be followed for a sequence of events where an extraneous Precedent (P1) begins the sequence of decision-making and design actions/output that may result in Homologized form (Hom form).

5.3.1.1 Trajectorizing in relation to the general flow model

In figure 5.3.1.1, P1 represents a precedent that can be considered derived via purposeful selection or serendipitously. However, once the designer is aware of the use of such initial precedent(s) and this becomes purposeful toward the development of the design, such precedents can be described a Trajectorized precedent (TP1). At this point also Attenuation (A) begins, the selection of the precedent is scrutinized, compared, contrasted and contextualised as to how it will facilitate the development of the design. The initial Trajectorized precedent (TP1) can be seen as a contextualizing precedent that aids constructing new form – Precedent Constructing (PC). If the attempt to construct new form is unsatisfactory, shaping is repeated until an agreeable or acceptable form is derived. Again, Attenuation is constant, the designer checking/testing/comparing etc. for what they determine as congruity and incongruity. When the designer decides that the form produced will be acceptable or useful to allow development to continue, this form becomes a Constructed Precedent (CP). As described above in section 5.2.2, an initial letterform or control character – eg. the lowercase n – may consist of a number of Constructed Precedents (CPn). It is at this stage Trajectorizing of a single character or the component parts thereof may be complete to the point to allow other subsequent forms



Key

P1 *Precedent*
TP1 *Trajectorized precedent*
PC *Precedent constructing*
CPn *Constructed precedent(s)*
EG *Endogenous generator*
Hom *Homology*
Hom m *Homologous mapping*
Hom d *Homologous drift*
Hom form *Homologized form*
h1 *Hom form becomes EG*

Begin/end
Process, task, action or operation
Decision
Evaluation

Figure 5.3.1.1
Flow/algorithm diagram for representing routines for Trajectorizing, Homologizing with Attenuating as constant.

to develop from this as a guide or rule. It is at the point CPn within the process of design where the designer has trajectorized an aspect of the design, contextually aimed and loaded this with potential to inform the development of subsequent form.

For the sake of this discussion, it could be considered that CPn represents a lowercase n based upon or influenced by an initial 'old style' precedent such as Bembo. The newly designed n would comprise a number of Constructed Precedents that have the potential to inform subsequent letterforms in the design. In terms of developing newly trajectorized form, this part of the process could repeat. For example, if a designer decided to attempt a lowercase o after completing what was considered a workable and useful lowercase n at this point, the designer could return to Trajectorizing new form for the lowercase o. However, if the designer decides to produce form using the newly trajectorized lowercase n as a basis to work from, the designer moves from actions/decsions etc. relative to Trajectorizing, to those relative to the core category Homologizing.

5.3.1.2 Homologizing in relation to the general flow model

To continue with the discussion of the example of process above, once the designer decides to utilize a newly formed Constructed Precedent or group of such precedents to inform subsequent design, the designer switches from actions and decisions pertaining to Trajectorizing to those of Homologizing (H). Homologizing describes the way in which the designer produces relational form within a text typeface design. Again, to return to the example above of CPn representing the lowercase n, Trajectorizing sees the designer laying down rule and guide in the form of Constructing Precedents internal to the process of the newly developing design. Designers in this sense then are setting precedents to follow at a point subsequently within the process of design. When a designer decides to use a Constructed Precedent or group of Constructed Precedents as the basis to develop subsequent form, eg. CPn lowercase n. The lowercase n in this example then becomes an Endogenous Generator (EG) in the process of design. A selected form, produced internally in the process of the design that will be

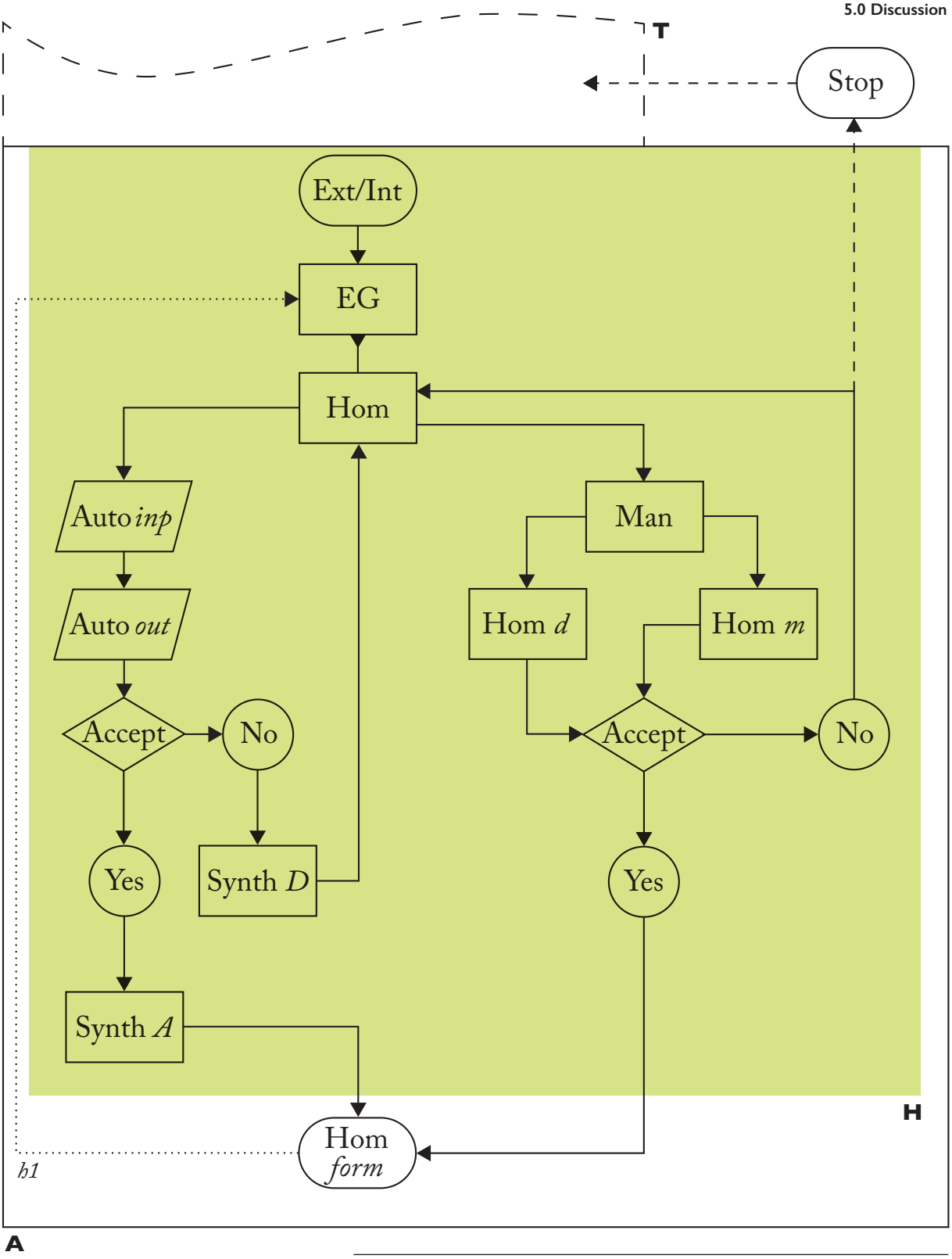
used to develop subsequent form. The switch from Trajectorizing, where the designer develops Constructed Precedents, laying down potential in the forms for potential rule and guide, to Homologizing, sees the designer picking up and following previously set rule and guide. The switch then is from setting precedent to following precedent internal to the process of design. Homologizing sees the designer producing relational form from earlier trajectorized form. In the example given above, the lowercase n could be used to provide the basis of other lowercase characters such as m, u, h, l, i etc. (see figure 5.2.2.1). Homologizing accounts for degrees of mutability in order to render relational form. For example, although the lowercase m may appear to be constructed from a duplication of the curve and right-hand side upright of the lowercase n, this in reality would be a much more subtle variation in mutable form. However, such forms may derive from a direct influence of the initially trajectorized lowercase n. Homology (Hom) then consists of two dimensions Homologous Mapping (Hom m) and Homologous Drift (Hom d). To develop this example in terms of discussion, if a designer had produced a sans serif lowercase n that subsequently was utilised as an Endogenous Generator (EG) to develop a lowercase u, dependent upon the design, the form of the n may only require rotation by 180 degrees in order to satisfy the design. The form of the lowercase n would not have needed altering in order to produce the lowercase u, only rotation. This would be an example of very close Homologous Mapping of form. If conversely, the lowercase n was used as the basis to create a subsequent lowercase m, this may require considerable Homologous Drift from the original form. Yet this may still satisfy the designer that there was enough adherence to the rule and guide of the Constructed Precedents that constitute the lowercase n that translate to the Homologized form (Hom form) of the lowercase m. In this example there would be a degree of Homologous Drift from the original form but not so much that it deviated so far from the rule and guide set in the original Constructed Precedents as to cause discernable incongruity between the new form and prior form. Too much drift in terms of homology and the designer may have to return to a fresh round of Precedent Constructing (PC) in order to derive a useful and workable form. This latter example may result when there is not enough information in the original Constructed

Precedent to follow as a guide for subsequent form. By means of illustration, an example here could be to consider the attempted development of a lowercase p from a lowercase n. There may be something of useful precedent in terms of stem width and the curve and connection found at the top of the lowercase n but not enough information in terms of how round the bowl of the lowercase p would be or how it should connect at the at the bottom of the bowl to the upright etc. These latter decisions would see the designer drifting too far from the original Constructed Precedent(s) in the lowercase n for them to be of use to aspects of the lowercase p. This would require constructing new precedents that would inform the lowercase p. Such newly Constructed Precedents for the rounded bowl would also have potential to inform subsequent forms with similar rounded elements.

5.3.1.3 Models for Extrapolation and Interpolation

As is mentioned above Figure 5.3.1.1 shows flow modelling that represent the core categories Trajectorizing, Homologizing and Attenuating in relation to text typeface design. This visual modelling of process is developed from the developed Grounded Theory in order to further elucidate the theory as part of this discussion. In Figure 5.3.1.1, Homology (Hom) is represented in relation to the process(es) of generating relational form relative to initially Trajectorized new form for the typeface design. However, once Homologized form (Hom form) has been created, this in turn has the potential to become an Endogenous Generator (EG) within the scheme of the design process (see line h1). For the purposes of example, a lowercase h, generated as homologized form from a lowercase n, could give rise to producing a lowercase l from the extended stem of the left-hand side of the n forming the h. In this case the lowercase h would become the Endogenous Generator for the lowercase l.

The general term Homologizing also applies to the Extrapolation and Interpolation of form. Figure 5.3.1.3.1 shows an algorithmic/flow model representative of the process(es) of Extrapolation and Interpolation with respect to text typeface design as developed from the Grounded



Key

Ext/Int *Extrapolation/Interpolation*
EG *Endogenous generator*
Hom *Homology*
Man *Manual*
Hom m *Homologous mapping*
Hom d *Homologous drift*
Auto inp *Automated input*
Auto out *Automated output*
Synth A *Synthetic Acquiescence*
Synth D *Synthetic Displacement*
Hom form *Homologized form*
h1 *Hom form becomes EG*

Begin/end
Process, task, action or operation
Decision
Evaluation
Input/output

Diagram 5.3.1.3.1
Flow/algorithm diagram for representing routines for Homologizing in terms of Extrapolation and Interpolation with Attenuating as constant.

Theory in chapter 4.0 etc. Within this flow model, the sequences relate to the manual (Man) production of Homologizing form with respect to Extrapolation and Interpolation and the automated production of such form (Auto inp + Auto out). It can also be noted that in this representation of actions and decisions, Trajectorizing (T) is outside the normal bounds of the process. Here Homologizing is the focus of activity whilst Attenuation remains constant as the background activity. Trajectorizing (T) only becomes employed if satisfactory Homologizing of form becomes impossible to achieve and the designer must resort to creating new form.

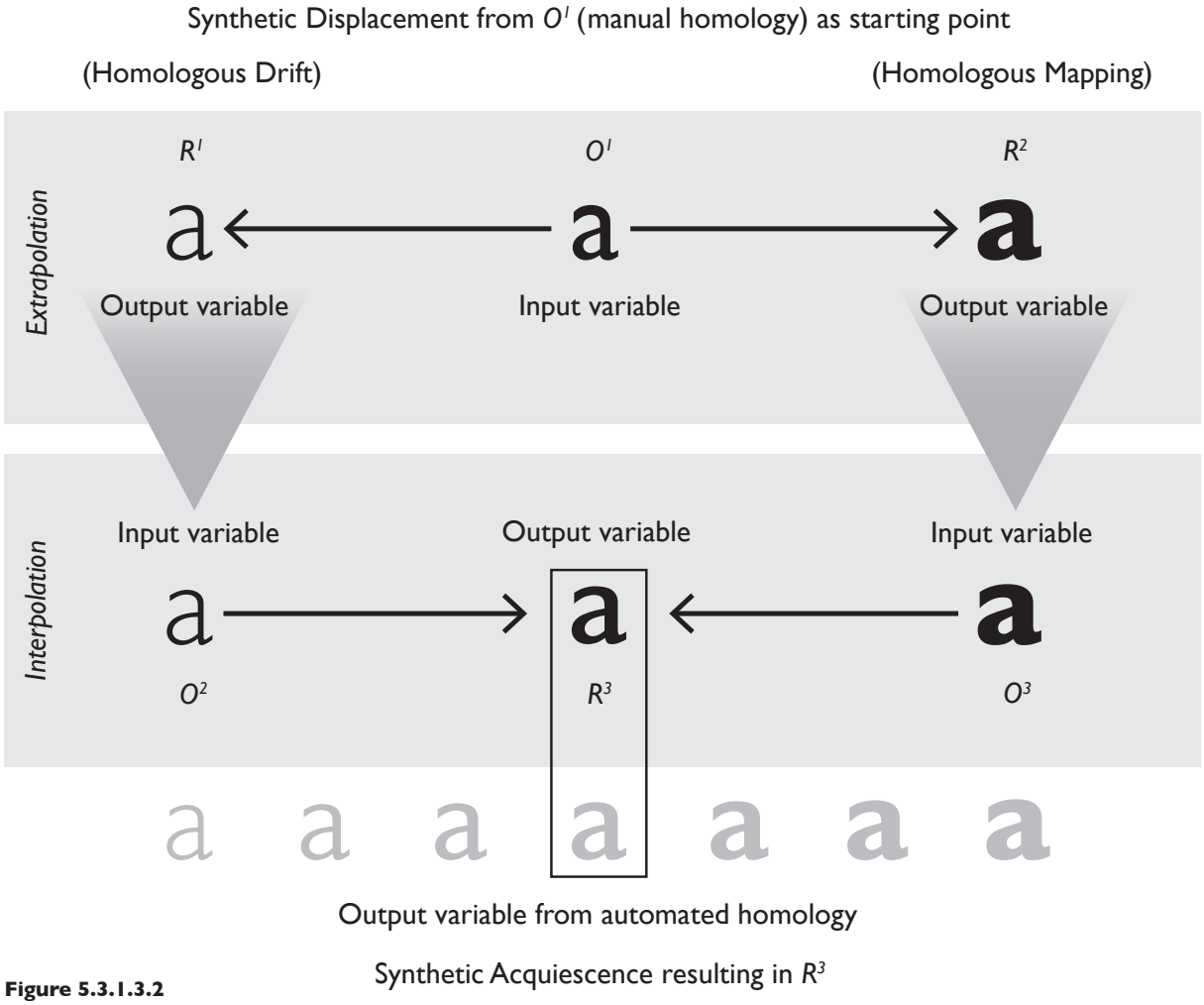


Figure 5.3.1.3.2
Matrix of Homology with respect to Extrapolation and Interpolation where O = origin and R = resultant. This shows the example of resultant forms of manual Extrapolation becoming the input variables for automated Interpolation.

Figure 5.3.1.3.2 represents a matrix of homology with respect to Extrapolation and Interpolation including representation of Synthetic Displacement and Synthetic Acquiescence, this also includes incidences of Homologous Drift and Homologous Mapping for the process of Extrapolation. The matrix represents possible homologous results for input variable O^1. In this example a lowercase a is used to illustrate the different categories of homology and their causal effects on a single character. The original design of the normal weight of the typeface is seen at O^1. This can be considered as an Endogenous Generator in this system of homology. In the top row of the diagram resultant outputs R^1 and R^2 can be seen as Synthetic Displacement of form in the manual transformation of outlines that produce a Lightweight variant (R^1) and an Ultra-bold variant (R^2). That is to say that the weighting/shaping of the forms have not been produced by wholly automated means, a degree of manual manipulation of the outlines has been employed in order to produce the resultant forms. The point of origin – variant O^1 – is therefore extrapolated as a single source to multiple targets, in this example this is represented by output variables R^1 and R^2. It can also be seen that in terms of the dimensions of homology – Homologous Mapping and Homologous Drift – there are discernable qualities in the transformation of form from the standard weighting of the form O^1 to the lightweight variant at R^1. Although the overall width of the character has not changed considerably, the overall appearance of the form at R^1 has lost the essential qualities of weighting and contrast of strokes found in O^1. There has been a noticeable degree of Homologous Drift in R^1 from O^1. However, this has not been so much so that the relationship between R^1 and O^1 has been destroyed or lost, there remains a good degree of homologous similarity. The relationship between O^1 and R^2 can be considered more successful in retaining qualities of the weighting and balance of strokes between the pairing, even given that R^2 is wider and heavier in weighting. In this latter pairing O^1 and R^2, a good degree of Homologous Mapping can be seen to exist, essential qualities of O^1 have not been compromised as far as in the pairing between O^1 and R^1. The synthesis of form $O^1 \rightarrow R^1$ and $O^1 \rightarrow R^2$ have been created by intervention of the designer manipulating the forms manually from source of origin to target in order to achieve a desired homologous relationship between the pairings.

Results have been achieved by means of Synthetic Displacement.

The second row in the matrix represents a process of Interpolation where **Synthetic Acquiescence** is represented. In this example the resultant forms of Extrapolation R^1 and R^2 as discussed above, now become the input variables, or points of origin O^2 and O^3. The target output in this example is given as resultant R^3. In this example, modifications are made to the Bezier points in O^2 and O^3 that will allow for a smooth transition of computer generated automatic interpolations. The transitions of interpolative steps can be seen in the lowest row of repeated lowercase a at the bottom of the diagram. The interpolated mid-weight character R^3 is the automated synthetic resultant. This is an example of Synthetic Acquiescence whereby the designer allows automated synthesis to produce the resultant form. In terms of homology, the relationships between O^2, R^3 and O^3 can arguably be considered to have closer Homologous Mapping than the relationship between R^1, O^1 and R^2. However, it can also be noted that the subtly designed qualities of weighting and balance of strokes in O^1 are lost in the auto-synthetic counterpart R^3. These are the kinds of complex differences of quality that Attenuation by designers would detect for and ultimately make decisions for. In the case of this example, a designer may argue in terms of Attenuation, that incongruity exists in the example of the auto-generated mid-weight R^3. Although, seamlessly congruent in terms of the synthesis of O^2 and O^3, it could be argued that this appears too mechanical in terms of a synthesised form relative to its points of origin. If this were the case, and the resultant R^3 is attenuated, this would result again in Synthetic Displacement by virtue of the designer's manual intervention, reworking or reshaping the resultant form.

5.4 Potential applications of the theory

The developed theory in this research and the visual modelling produced to accompany this by way of discussion above, offer potential for further applications and usage beyond that of the description and explanation of text typeface design process outlined in this research report. The theory and visual modelling detailed in here not only have the power and ability to

explain text typeface design process from the perspective of expert witnesses. As well as the theory's explanatory ability, this has the potential to be applied as both an analytical and prescriptive tool.

5.4.1 Theory as analytical tool

By way of example, this section will give a brief account on the analytical potential of the theory developed in this research. The theory applied as an analytical tool can be considered useful in further study of text typeface design process, knowledge and artifice. The immediately obvious usage would be in applying the concepts of the theory in studying further conversations with text typeface designers. In this application the developed theory hypotheses and concepts would become an analytical tool for verification testing. This could be seen to be useful where the theory as developed from the perspective of expert participants aligns or deviates from the testimonies or actions of mid-weight or novice designers with respect to text typeface design.

The theory developed in this research also comes from the perspective of focusing expert knowledge toward the Latin alphabet. Applying the theory as an analytical tool toward the designing of other language/script bases would allow a useful starting point where little recorded knowledge or research is available to refer to.

The theory may also prove useful as a tool in terms of the analysis of extant design artifice also. Using the explanatory theory to study the output of text typeface designers may be useful in terms of understanding text typeface design from the perspective of the designed forms – the knowledge embedded within the objects of design. In this manner the theory may allow for more insightful understanding of how and why a design may be successful or unsuccessful due to the inherent nature of it's construction. This kind of analysis may also aid the practicing designer gain greater insight and understanding as to the nature of approaching the process of designing text typeface design.

5.4.2 Theory as prescriptive tool

With reference to the above, the theory also has the potential to inform instruction of text typeface design. As a prescriptive tool, the theory offers a guide to follow in terms of the processes or routines encountered in the designing of text typeface design. The algorithm/flow diagrams 5.3.1.1 and 5.3.1.3.1, it is anticipated, could aid mapping out the possible steps and routines that need to be considered or observed in developing the text typeface design. In terms of approaching design or the instruction of design, concepts such as Precedent Constructing not only make clear what aspects require consideration but why they are important in terms of what they will facilitate and inform within a developing design. Theoretical concepts such as the switch between Trajectorizing and Homologizing by means of Endogenous Generation not only help to explain what happens in terms of design but in terms of applying these concepts to designing itself, would help contain and delimit routines for designers and instructors. Seeing Attenuation as a constant, the way in which expert designers describe this may help novice or less experienced designers go beyond what may be habits of Generate And Test, where the gaps between generation and testing are left too long or infrequent to suffice for successful text typeface design.

5.5 Summary

This discussion extends the developed theory in this research, supporting and further elucidation by means of visual modelling and example given in the sections above. This demonstrates that the theory is workable, adaptable and robust as far as the substantive area of text typeface design in this study is concerned. The theory can be seen not only as a model for describing and explaining text typeface design process but also as a tool for the analysis of design knowledge, activity and artifice with respect to text typeface design. It has also been discussed how the theory may be used as a prescriptive tool in terms of design activity and pedagogy with respect to instruction of design process via mapping activity to the models of description and flow that the theory and visual modelling facilitate. In this respect, the developed Grounded Theory of Contemporary Processes of Text Typeface Design offers a 'theoretical completeness' (Glaser 1978, p.125). This can be seen not

only in the concepts raised in this research, in that they offer powerful stand-alone and interrelated descriptions and explanations of text typeface design process, but also in that it can be argued and demonstrated that the theory can be extended and applied toward further study, practice and pedagogy in terms of adoption as analytical and/or prescriptive tools. It is with this in mind that the developed theory in this research should and conveniently does, resolve also by means of a mnemonic. Terms used to describe the developed theory in this research attempt to convey as accurately as possible the nature of the collections of concepts, actions and phenomena. It is the naming of the higher order resolved core categories however, that resolve this research with respect to text typeface design process. These offer immediate conceptual 'grab' (Glaser 1978) as portable, useable concepts and tools with which to describe, study and apply to the practice of text typeface design. With respect to text typeface design, the terms: Trajectorizing, Homologizing and Attenuating as theory resolves conveniently as the mnemonic – THAt.

6.0 Conclusion

Contents

6.0 Conclusion

6.1 Introduction

This chapter summarises the research and theory generation presented. Here results of the research are considered with respect to the initial aims and intentions set out at the beginning of this thesis. This chapter also presents the unique contributions of the research, its limitations and implications. Also set out are considerations for possible further work and applications of the developed theory within the areas of design practice and pedagogy. Finally, this chapter considers the generated theory in relation to what Glaser (1998) describes as a successful Grounded Theory.

6.1.1 The original aims and the contributions of this research

As set out in the first chapter, Introduction 1.0 of this thesis the original research question is:

Can knowledge of text typeface design process be revealed and if so can this be explicated theoretically?

The aims of this research in relation to the research question were as follows:

1. To reveal and describe processes of text typeface design from accounts given by type design experts.

2. To evaluate whether it is possible or not to construct theory or theories of type design process from the accounts of practice and procedure given by type design experts.

3. To offer possible, descriptive and/or generative theory/theories that will allow further study to develop in the area of text typeface design process as well as informing practice.

The research aims 1 and 3 are satisfied by the development of the Grounded Theory that emerges from this study (Chapter 4.0). Research aim 1 is also in-part satisfied by means of the body of collective conducted interviews in this study. The interviews conducted with type design experts offer a unique body of collective knowledge and contribute to the knowledge in the field of text typeface design as a body of recordings that are epistemologically rich in nature. The employment of Grounded Theory Methodology in terms of its analytical constant comparative rigour and concept and theory development methods satisfies research aims 2 and 3. This was facilitated via the coding and constant comparison of the transcribed data analysed in conjunction with the video recordings of the interviews with text typeface design experts. From this, identified patterns in the data and coding were raised to a conceptual level of explication via the Grounded Theory method of Memoing. The author also devised a new method, Empathic Memoing (see Chapter 3.0, section 3.7.2). This contributes to knowledge not only in terms of the devised method itself but also in the output produced from this method. This is by means of experiential engagement with aspects of the practice of type design, empathetic to testimony given by the expert participants in this research. Examples of output from Empathic Memoing (see sections: 3.7.2, 5.2.2) facilitated a deeper understanding in relation to aspects of the participants' testimony. This allowed the author to experience first hand, phenomena discussed within the data and gain greater understanding of the participants' descriptions of design process.

The resolving of codes and categories by way of the three emergent core categories, their sub-categories, dimensions and codes satisfy research aims 2 and 3. These aims are satisfied by means of the presented developed Grounded Theory in this study. Chapter 4.0 renders this developed Grounded Theory in terms of theoretically describing and explaining text typeface design process, relative to and grounded by the primary data. Chapter 5.0 Discussion, offers examples of how it is anticipated that the developed theory may be considered, not only in explaining text typeface design process, but also how the developed theory may be applied as an analytical and prescriptive tool in terms of possible future usage. Implications with respect to this are outlined and extended further in this chapter below.

The development of the theory in this research constitutes an overall contribution relative to the identified knowledge gap with respect to text typeface design process. It is the author's belief that this study presents for the first time, a theory of text typeface design process, derived via research, based on and grounded by primary data from testimonies of expert participants.

6.1.1.1 The contributions of this research

This section sets out claims to the contributions to knowledge that this research provides and are as follows:

1. The body of knowledge generated by the conducted interviews.
These offer a unique set of interviews with contemporary pre-eminent type design experts, which are focused by the remit of this research, the research aims and the method of conducting the interviews (open-ended and semi-structured in manner). This has allowed for breadth and depth in the capturing of data. These offer an epistemologically rich rendering of specialist expert knowledge with respect to text typeface design process. (See chapter 3.0, section 3.4.5 and also Appendix 4.0, 5.0, 5.1, 7.0 for example and explanation of the primary data collected)

2. The development of each of the core, sub-categories and dimensions:

2.1 Trajectorizing

2.1.1 Contextualizing

2.1.2 Precedent Constructing & Constructed Precedent

2.2 Homologizing

2.2.1 Endogenous Generation & Endogenous Generator

2.2.2 Homologous Drift

2.2.3 Homologous Mapping

2.2.4 Synthetic Acquiescence

2.2.5 Synthetic Displacement

2.3 Attenuating

2.3.1 Attenuation

2.3.2 Accretive Amelioration

2.3.3 Envisioning

2.3.4 Historical Immersion

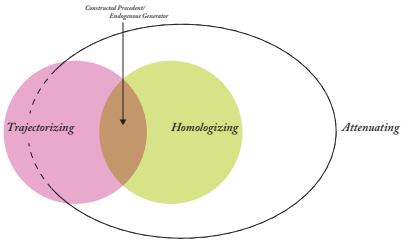
Each of the above core categories, sub-categories and dimensions conceptualise and present aspects of the expert participants' knowledge, design thinking, decision-making and actions relative to the processes of text typeface design. This presents unique insights and explanatory renderings of text typeface design practice in a resolved cogent form that collectively contributes original knowledge. The collective core categories, sub-categories and dimensions resolve as the central, most significant, contribution to knowledge in the substantive area by means of theoretical renderings offered by this research. Each of the categories etc. offer a conceptualised rendering that account for and compile relationships between fragmented instances within the collected primary data, in accordance with Grounded Theory Methodology. (See chapter 4.0 and sections 4.1, 4.2 and 4.3)

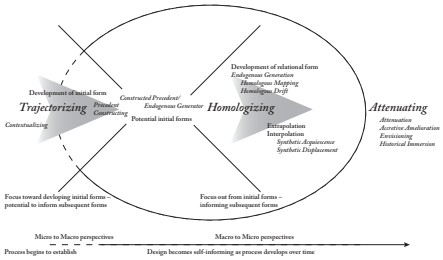
3. The creation of a new method – Empathic Memoing – as part of the overall Grounded Theory Methodology.

The creation of the Empathic Memoing research method contributes to the general practice of research. This was devised as a unique methodological tool to deepen understanding via experiential engagement with the nature of the subject matter under scrutiny. Initially this has been devised as part of this study's overall Grounded Theory Methodology. However, it is anticipated by the author that this method may provide opportunity for other researchers who engage with practice, to better understand experiential insight with respect to focused aspects of similar analysis. Empathic Memoing in this research was facilitated via producing designed visual exercises that were also valuable in supporting and illustrating aspects of the developing theory and its later discussion. (See chapter 3.0, section 3.7.2 for a description and discussion of this developed method and chapter 5.0 section 5.2.2 for examples of visual materials that enabled and supported instances of Empathic Memoing with respect to this research.)

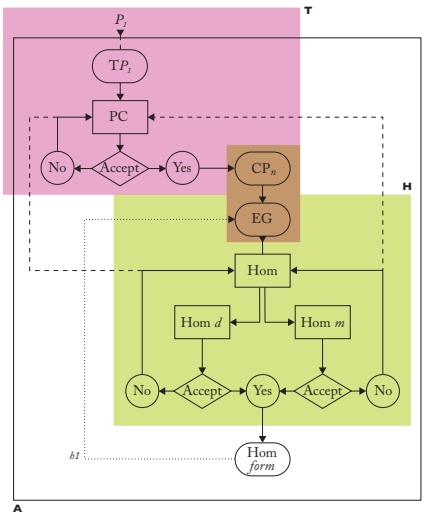
This research also includes contribution to knowledge via its discussion by means of visual diagramming in support of the developed theories:

4.0 Visual diagramming as overview of the process of text typeface design (See chapter 4.0, section 4.04 and chapter 5.0 section 5.2, figures repeated below). These diagrams aid and support the conceptual overview of the developed core categories, their relationship to each other and the relationships of respective sub-categories to the core categories.

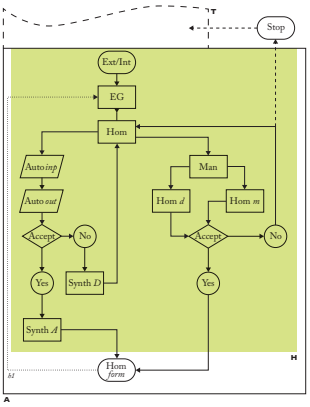


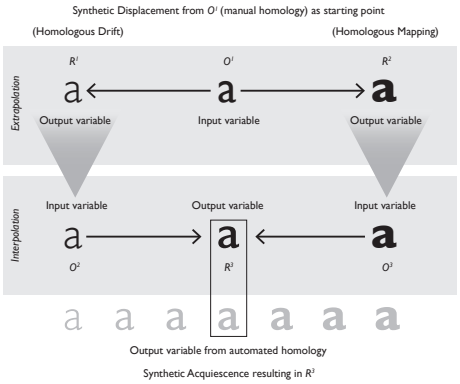


4.1 Visual diagramming of the routines and subroutines of design in accordance with the developed theory for Trajectorizing and Homologizing relative to Attenuating (See chapter 5.0 section 5.3.1.1, figure repeated below). This flow/algorithm diagram represents routines and relationships for the three core categories, their sub-routines and related decision-making options.

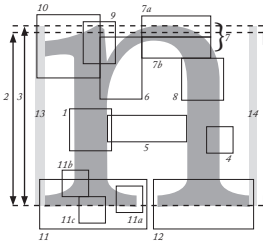


4.2 Visual diagramming of the routines and subroutines associated with the design activity of Homology in relation to Extrapolation and Interpolation and the identified sub-categories and dimensions pertaining to this identified in this study (See chapter 5.0 section 5.3.1.3, figures repeated below). These diagrams aid in supporting the developed theory with regard to the ways in which the manipulation and development of relational and mutable form is considered. These diagrams also visually encompass and situate extrapolation and interpolation as preexisting phenomena relative to the developed theory in this research.





4.3 Visual diagramming that emanates from Empathic Memoing (See chapters 3.0 section 3.7.2 and chapter 5.0 section 5.2.2, figures repeated below). These diagrams illustrate created visual phenomena in relation to Empathic Memoing as a contribution to knowledge. These diagrams are examples of acts of practice undertaken by the author in order to gain further understanding in relation to the data in order to aid the development of theory within this research.



6.2 Limitations of the research

This research was conducted in order to evaluate whether theory could be developed via the collection and analysis of data in the form of testimonies from text typeface design experts, that would describe and explain process or processes of text typeface design.

The methodology used to conduct this research was Ground Theory Methodology. Although competing blends/perspectives of Grounded Theory Methodology are argued for (Glaser & Strauss 1967, Glaser 1978, 1998, 2003, Strauss & Corbin 1990, Charmaz 2006), it was decided to apply Grounded Theory Methodology in accordance with Glaser's principals in terms of methodological fit (See chapter 3.0 and see Appendix 1 for full discussion).

Grounded Theory Methodology is a theory generating methodology, one that requires conceptual saturation of generated ideas through the emergence of concepts related directly to patterns and instances in the data. In order to survive, concepts must also fit and re-fit to the data as the researcher works across existing and emerging data in the development of the research. Concepts and ideas describe what is 'going on' in the data and emerge, compete and remain only when they are grounded by the data (Glaser & Strauss 1967, Glaser 1978, 1998, 2003).

This research has in-part been necessarily limited in terms of the kinds of participants involved. The study has focused upon expert knowledge of process within the field rather than novice or intermediate knowledge, or indeed combinations of these different perspectives. Gender of participants was not determined as a distinct variable within the research due to the nature of what emerged from the testimonies of the participants and the theoretical sampling conducted. The content of the gathered testimonies inferred nothing in terms of any gender specific bias in knowledge of process. Again, although the study includes participants of different ages and nationality, these are variables in themselves that could be studied specifically in relation to the subject matter. These aspects can be seen as limitation and this is also acknowledged by the author.

By default, any single approach to research will have its limitations. This research offers theory generated via Grounded Theory Methodology, specifically from the substantive area of interest. This research does not claim to offer results derived as research of verification or of a comparative study nature. Consequently, this research does not claim for results derived from applied research in the form of hypothesis testing or from the observation of enacted practice. These limitations are also acknowledged by the author. However, theory that does emerge from this research provides a set of 'grounded' hypotheses that will enable future research to develop by offering themes and concepts, along with the limitations mentioned here as possible future starting points for further enquiry.

6.3 Implications of the research

6.3.1 The literature in terms of text typeface design

The gap in knowledge identified in this research was with respect to a lack of recorded knowledge – particularly evident in terms of research-based knowledge – relating to the processes of text typeface design. It was identified that such paucity had endured for a considerable period of time. Notable reference works such as Moxon's seventeenth century accounts of printing trade and practice, Fournier's eighteenth century account of type-founding and Legros & Grant's early twentieth century study of printing technology, although authoritative works in themselves, offer little that refer to the designing of types within an overall commentary of either survey or personal perspective of practices. It was highlighted with the Literature Review 2.0, that with respect to these authoritative works, none offer an adequate overview on the process or processes of designing text typefaces.

This research offers a major contribution to knowledge by means of a workable theory, generated from the analysis of accounts of knowledge of practice given by text typeface design experts. This research therefore contributes to the extant body of knowledge that exists for the subject domain literature. From this research, the author also anticipates producing further publications in the form of journal articles and research informed

publications such as text books or contributions to chapters within edited books etc. in order to aid the dissemination and contribution to subject knowledge that this study offers. It is anticipated that the author will also disseminate theory and outcomes from this research through conference papers, workshops and invited talks/lectures (eg. conferences such as those organised by Association Typographique Internationale) in the future.

6.3.2 Further work

It is anticipated that this research will act as a base or foundation upon which further research in the area of text typeface design process will develop. In this sense, it is hoped that this research establishes a positive contribution to knowledge in the subject area through its evidenced based explication of practice related knowledge. Such evidenced-based or research-based work is important in an area where much of the subject knowledge still appears to reside as tacit knowledge – in many ways, the preserve of those who know how to do through the experience of doing. Going beyond tacit acknowledgement of subject expertise and establishing consensus with regard to formalising concepts and descriptions of design knowledge and activity in the specialist subject area may take some time to develop. However, it is the author's hope that the results of this research in some way aid furthering discussion in the subject area with regard to the relationship between practitioner knowledge, knowledge of practice and how such knowledge is described and disseminated. Establishing clear concepts that describe the subject area through evidenced based research will also facilitate describing the subject beyond an homogeneous audience. That is to say, beyond the bounds of those within and connected to the subject area specifically. It is the author's hope that explication of the concepts that describe the subject will allow for dialogue between subject disciplines to develop, where such dialogue can be evidenced based rather than merely based upon speculation or aphorism. In this regard contributing to the developing professionalisation of the subject area.

Research in this study has been intentionally limited to the collection and analysis of data from type design experts that discusses and describes

designing with respect to Latin category typeface design. This research is potentially useful as a basis in order to explore other language bases with regard to typeface design.

At the time of writing, the author has had the opportunity to utilise aspects of the developed theory by applying these within his own teaching practices. This has been at both undergraduate BA(Hons) level and Master of Arts level where students have been developing typeface designs. For the students, this proved to be beneficial for understanding key aspects of the processes of design. In these cases concepts described as Trajectorizing and Homologizing were simplified by the author in order to discuss and explain notions with regard to the 'trajectory' of design and the 'mutable' nature of 'relational' form. These discussions enabled students to think about initial micro elements within the forms of early letters they were designing and how this would have an overall influence on form that was to be subsequently developed. This allowed students to consider the micro and macro nature of approaches to typeface design, something as novice designers that they had not previously considered. This brief example illustrates how theory from this study has been directly applied to the contexts of teaching and the practice of designing type. The terms created in this research have been developed to provide clear conceptual delineation. It is anticipated that the terminology within this study will be adapted for use over time within the fields of education and practice. However, what is important to note is that the developed terms aid conceptual distinction. In the example above students were introduced the concept of 'trajectory' in relation to their own design thinking and decision-making. This was then supported and reinforced by linking to the theoretical gerund Trajectorizing relative to describing expert practitioner knowledge.

Intention and motivation of this research focused on the collection of data relating to expert knowledge. Analysis and development of conceptual explication from the data generated theory specific to text typeface design process. Although some parallels have been drawn between this research and existing research and thinking towards design process generally (see chapter 5.0 sections 5.2.2, 5.2.4), it is anticipated that further future research may

evaluate possible connections with what is described here as design process for text typeface design and design process research in other domains.

Beyond the scope of text typeface design this research may provide useful insights and applications toward future research in other related areas of design. Subject areas such as Graphic Design generally but also specialist subject domains such as Typography, Book Design, Information Design and Exhibition Design etc. where at present little exists in terms of research in relation to expert knowledge of design process. Subject areas such as Architecture and Product Design may also find use for some of the concepts developed in this study. Aspects of theory in this research such as micro and macro approaches, together with concepts of trajectory, mutability of relational form and constant attenuation toward design may find resonance beyond the substantive subject level offered here. Such concepts may offer starting points or hypotheses upon which further applied research in related fields may find use for evaluating similarities and/or differences between discrete disciplines.

This research has concentrated upon testimonies of expert participants. It is also anticipated that the theory generated from this study may be useful in terms of studying and analysing the behaviour of design novices or design students in terms of the ways in which they understand and approach text typeface design. To extend this research along such paths may provide useful means by which to understand the nature that experts differ from novices with approaches to text typeface design. Also that the generated theory from this research may provide a useful basis in order to theoretically frame the practice in terms of education and instruction. This could prove useful for both educators and those who whish to gain insight to the process of text typeface design for self-instruction and practice.

It is anticipated that theory developed in this research will find use as an evaluative tool both for manifest design and also enable text typeface design activity to be analysed. As text typeface design appears to involve lengthy periods of time in order to produce workable or finished versions of the designs, longitudinal studies may be required to observe and analyse

a complete process of design from beginning to end. The theory produced in this study may be useful as a base or starting point from which to orientate such studies. It may be used as a descriptive framework against which observations could be made or tested. The theory produced in this research may also prove useful for shorter protocol studies where parts of the processes of design are observed. Again the theory produced within this research would assist in the framing and scoping of such studies in terms of what may be identified and for what specific purposes. This research offers a series of grounded hypotheses that reveal and explicate deep connections in terms of thinking, actions and results with regard to the process of text typeface design. Such theory can offer initial hypotheses as the basis upon which comparative and verification type studies may develop in future.

6.4 In summary of the Grounded Theory

This research resolves in three core categories. These are: **Trajectorizing**, **Homologizing** and **Attenuating**. The resolved core categories of the developed theory also allow for the neatly fitting acronym and mnemonic, by which the theoretical categories may easily be recalled – THAt.

The theory developed as a result of this research can be seen to have 'theoretical completeness' (Glaser 1978), insofar that it not only aligns with what Glaser deems as necessary for a grounded theory to fulfil the qualification of 'completeness' but in that the theory also fulfils the original aims of this research.

In his book 'Doing Grounded Theory: Issues and Discussions', Glaser gives four clear criteria by which a grounded theory generated in a '…close, cogent way…' (Glaser 1998, p.18) to the data may by judged. Firstly Glaser outlines what he determines as 'fit' in terms of generated grounded theory:

> Fit is another word for validity. Does the concept adequately express the pattern in the data which it purports to conceptualize. Fit is continually sharpened by constant comparisons. (Glaser 1998, p.18)

The theory developed in this research aligns with what Glaser describes

above. Concepts generated by this research have emerged from the data. They have been developed through the rigorous constant comparison of instances identified within the data and the patterns of such instances that appear. These in turn have led to the generation of concepts that capture and explicate, concepts that get to the heart of 'what is going on' in the data via instances and their relative patterns that appear in the data. The concepts of the theory in this research 'fit', they are valid in that they emerge from the data and data patterns. Fragmentary instances within the data are captured and conceptualised, thus presented coherently within this research as a conceptual/theoretical package that allows the reader and user of the theory to grasp and understand what hitherto lay as latent or hidden connections regarding knowledge of text typeface design processes.

Fit then leads to what Glaser secondly describes as 'workability'. He explains thus:

> Workability means do the concepts and the way are related into hypotheses sufficiently account for how the main concern of participants in a substantive area are continually resolved.
> (Glaser 1998, p.18)

This research presents three individual core categories where each one resolves and hypothecates what has emerged from the data. The core categories also resolve in terms of each other. This research presents a resolved, workable, conceptual theory. Theory that not only describes and explains what happens with respect to text typeface design process but a theory that may be applied as an analytical and/or prescriptive tool in terms of framing possible future study, research, pedagogy and practice. It is anticipated the theory developed in this thesis will enable future hypothesis testing, comparative and observational studies to develop. The illustrations developed in the Discussion (chapter 5.0) of this research demonstrate the 'workability' of the developed theory.

This research also anticipates potential future uses and applications for the developed theory that have relevance toward the substantive subject

area of text typeface design practice. Glaser's third point in describing the usefulness of a generated Grounded Theory is in its relevance 'Relevance makes the research important, because it deals with the main concerns of the participants involved…' he continues 'Relevance, like good concepts evoke instant grab' (Glaser 1998, p.18). This research presents relevant theory that can be linked directly to the knowledge, thinking and actions described by the participants.

Glaser's fourth criterion relates to the ability of the theory to adapt to new data if and as it emerges:

> Modifiability is very significant. The theory is not being verified as in verification studies, and thus never right or wrong … it just gets modified by new data to compare it to … New data never provides a disproof, just an analytical challenge. (Glaser 1998, p.19)

The terms and language developed for the theory in this research represent a formalised view of describing text typeface design process at the substantive level. The Grounded Theory presented in this research works by generating theory that is grounded at each and every stage of the analysis and development of the theory. The aim was to generate theory where insufficient explanation of text typeface design process existed previously. The theories presented in this study are open to modifiability as in accordance with Grounded Theory Methodology. It is anticipated by the author that such modifiability may come through future applied and experimental research, it is hoped that such future research will add to, extend and enrich what has been initiated and set forth in this thesis.

Bibliography

Bibliography

Adamson, G. (2007) *Thinking Through Craft*. Oxford: Berg

Ahrens, T. (2006) *A Multiple Master based method for scaling glyphs without changing the stroke characteristics*. Retrieved From: http://remix-tools.com/about/Tim_Ahrens_MM_method.pdf

Akin, Ö. (1986) *Psychology of Architectural Design.* London: Pion

Alexander, C. (1964) *Notes on the synthesis of form.* Cambridge: Harvard University Press

Almquist, J. & Lupton, J. (2010) Affording Meaning: Design-oriented research from the humanities and social sciences. *Design Issues, 26*(1), 3–14

Anderson, B. F. (1975) *Cognitive Psychology – The study of knowing, learning and thinking*. New York: Academic Press

Anderson, J. R. (1996) *The Architecture of Cognition*. Mahwah: Lawrence Erlbaum Associates

Ashcraft, M. H. (2002) *Cognition* (4th ed.). London: Pearson

Atman, C. J., Turns, J., Cardella, M. E. & Adams R. S. (2003) The Design Processes of Engineering Educators: Thick Descriptions and Potential Implications. In Cross N. & Edmonds E. (Chairs) *Proceedings of Design Thinking Research Symposium 6: Expertise in Design.* Sidney: University of Technology

Avis, F. C. (1967) *Edward Philip Prince – Type Punchcutter*. London: Glenview Press Ltd.

Ball, J. (1973) *William Caslon 1693–1766: The ancestry, life and connections of England's foremost letter-engraver and type-founder.* Kineton: The Roundwood Press

Baines, P. & Haslam, A. (2002) *Type & Typography*. London: Laurence King

Benner, P. E. (1984) *From novice to expert: excellence and power in clinical nursing practice.* California; London: Addison-Wesley

Baudin, F. (1989) *How Typography Works (and why it is still important)*. London: Lund Humphries

Baudin, F. & Hoeflake N. (1973) *The type specimen of Jacques-François Rosart – Brussels 1768: A facsimilie with an introduction and notes.* Amsterdam: Van Gendt & Co.

Bauermeister, B. (1988) *A manual of comparative typography – The Panose System.* New York: Van Nostrand Reinhold Company

Bayazit, N. (2004) Investigating Design: A review of forty years of design research. *Design Issues, 20*(1), 16–29

Birks, M. & Mills, J. (2011) *Grounded Theory: a practical guide*. Los Angeles and London: Sage

Blackwell, A F., Eckert, C M., Bucciarelli, L L., & Earl, C. F., (2009) Witness to Design: A phenomenology of comparative design. *Design Issues, 25*(1), 36–47

Blades, W. (1875) *Some Early TypeSpecimen Books of England, Holland, France, Italy and Germany*. London: J.M. Powell

Bousbaci, R. (2008) Models of Man in Design Thinking: The bounded rationality episode. *Design Issues, 24*(4), 38–52

Brawne, M. (2003) *Architectural Thought, the design process and the expectant eye*. Oxford: Architectural Press

Briem, G. (1998–2001) *Notes on Type Design, Type, Handwriting and Lettering.* <http://briem.ismennt.is>

Bringhurst, R. (2005) *The Elements of Typographic Style* (3rd ed.). Point Roberts: Hartley & Marks

Bryant, A. & Charmaz K. (Eds.) (2007) *The Sage Handbook of Grounded Theory.* London: Sage

Bucciarelli, L. L. (1994) *Designing Engineers.* Cambridge, Mass. and London: The MIT Press

Buchanan, R. (1999) Design Research and the New Learning. *Design Issues, 17*(4), 3–23

Burke, C. (1995) *Paul Renner and German typography, 1900–1950.* Department of Typography & Graphic Communication. Doctoral Thesis

Burke, C. (1998) *Paul Renner, The art of typography*. London: Hyphen

Carter, H. (Ed.) (1930) *Fournier on Typefounding – The text of the Manuel Typographique (1764–1766) translated into English and edited with notes*. London: Soncino Press

Carter, H. (1937) The optical scale in typefounding. *Typography 4*, Autumn, 2–6.

Carter, H. (1969) *A view of early typography – up to about 1600: The Lylle Lectures 1968*. Oxford: Clarendon Press

Carter, H. (1955) *Letter Design and Typecutting*. Bristol: College of Technology

Carter, H. & Vervliet, H. D. L. (1966) *Civilité Types*. Oxford: The Oxford Bibliographical Society, Oxford University Press

Carter, S. (1995) *Twentieth Century Type Designers*. New York: Norton

Charmaz, K. (2006) *Constructing Grounded Theory: A practical guide through qualitative analysis*. London: Sage

Charmaz, K. & Bryant T. (Eds.) (2007) *The SAGE handbook of grounded theory.* London: SAGE

Cheng, K. (2005) *Designing Type*. London: Laurence King.

Clair, C. (1960) *Christopher Plantin*. London: Cassell

Child, H. (Ed.) (1971) *Edward Johnston – Formal Penmanship*. London: Lund Humphries.

Cross, N. (2001) Designerly Ways of Knowing: Design discipline versus design science. *Design Issues, 17*(3), 49–55

Cross, N. (2003) The Expertise of Exceptional Designers. In Cross N. & Edmonds E. (Chairs) *Proceedings of Design Thinking Research Symposium 6: Expertise in Design.* Sidney: University of Technology.

Cross, N. (2007) *Designerly Ways of Knowing.* Basel: Birkäuser

Cross, N., Dorst, K., and Christiaans, H. (Eds.) (1996) *Analysing design activity*. Chichester: Wiley

Darke, J. (1979) The Primary Generator and the Design Process. *Design Studies 1*(1), 36–44

Davis, H. & Carter, H. (Eds.) (1958) *Joseph Moxon – Mechanick Exercises on the Whole Art of Printing (1683–4)*. London: Oxford University Press.

DeRose, K. (2005) *What is Epistemology?: A brief introduction to the topic*. Retrieved from: http://pantheon.yale.edu/%7Ekd47/What-Is-Epistemology

Design Museum (2010) *How to Design a Typeface*. London: Conran Octopus

De Vinne, T.L., (1885) *Historic Printing Types*. New York: The Grolier Club

De Vinne, T.L. (1900) *The Practice of Typography. A Treatise on the Processes of Type-Making, the Point System, the Names, Sizes, Styles, and Prices of Plain Printing Types*. New York: Century Co.

Detrie, T. (1999) *Font Fundamentals: Font Design*. Retrieved from: http://www.public.asu.edu/%7Edetrie/pages/fundamentals_fonts/pages/font_design.html

Dey, I. (1999) *Grounding grounded theory: Guidelines for qualitative inquiry.* San Diego: Academic Press

Dorst, K. (2006) Design Problems and Design Paradoxes. *Design Issues, 22*(3), 4–17

Dreyfus, H.L. & Dreyfus, S.E. (1986) *Mind Over Machine: The power of human intuition and expertise in the era of the computer.* New York: Free Press

Dürer, A. (1535/1965) *Of The Just Shaping of Letters – Translated by RT. Nichol from the latin text of the edition of MDXXXV*. New York: Dover

Dwiggins, W. A. *WAD to RR. (1940) A letter letter about designing type.* Cambridge, MA: Harvard College Library

Earls, D. (2002) *Designing Typefaces*. Mies: Rotovision

Eastman, C. M. (1970) On the analysis of the intuitive design process. *New Directions in Environmental Design Research: proceedings of EDRA 9*. Washington, EDRA. 325–337

Fallman, D. (2008) The Interaction Design Research Triangle of Design Practice, Design Studies, and Design Exploration. *Design Issues, 24*(3), 4–18

Farleigh J. (1945) *Fifteen Craftsmen on Their Crafts*. London: Sylvan Press

Feyerabend, P. (1978) *Against Method: Outline of an anarchistic theory of knowledge*. London: Verso

Folkmann, M. N. (2010) Evaluating Aesthetics in Design: A phenomenological approach. *Design Issues, 26*(1), 40–53

Fournier, P. S. (1995) *The Manuel Typographique of Pierre-Simon Fournier le Jeune: Together with Fournier on Typefounding* (1764-1766) (transl. H. Carter, H. ed.; Mosley, J). Darmstadt: Technische Hochschule

Gerhard, M. J. (2008) *The Power of Precedent*. Oxford: Oxford University Press

Gettier, E.L. (1963) Is justified true belief knowledge? *Analysis 23*, 121–123

Gill, E. (1931/2007) *An Essay on Typography.* Jaffrey: David R. Godine

Gill, E. (1940) *Autobiography*. London: Jonathan Cape

Given, L. M. (Ed.) (2008) *The Sage Encyclopedia of Qualitative Research Methods*. California: Sage

Glaser, B. G. (1978) *Theoretical Sensitivity*. California: Sociology Press

Glaser, B. G. (1998) *Doing grounded theory: Issues and discussions*. Mill Valley: Sociology Press

Glaser, B. G. (2003) *The grounded theory perspective. Vol.2, Description's remodeling of grounded theory methodology*. Mill Valley: Sociology Press

Glaser, B. & Strauss A. (1967) *The Discovery of Grounded Theory: Strategies for qualitative research*. New York: Aldine

Goldschmidt, G. (1998) Creative architectural design: Reference versus precedence. *Journal of Architectural and Planning Research, 15*(3), 258–270

Goldschmidt, G. (2003) Expert Knowledge or Creative Spark? Predicaments in Design Education. In Cross N. & Edmonds E. (Chairs) *Proceedings of Design Thinking Research Symposium 6: Expertise in Design*. Sidney: University of Technology.

Goldschmidt, G. (2011) Avoiding design fixation: Transformation and abstraction in mapping from source to target. *Journal of Creative Behavior, 45*(2), 92–100

Goudy, F. W. (1922) *Elements of Lettering*. New York: Mitchell Kennerley

Goudy, F. W. (1933) O*n Designing a Type Face. The Dolphin – A Journal of the making of books*. Number one, 3–23

Goudy, F. W. (1940) *Typologia – Studies in Type Design and Type Making with Comments of the Invention of Typography – The First Three Types – Legibility and Fine Printing*. Berkerley and Los Angeles: University of California Press

Goudy, F. W. (1989) *The Alphabet and Elements of Lettering*. London: Bracken Books

Goulding, C. (2002) *Grounded Theory: A Practical Guide for Management, Business and Market Researchers*. London: Sage

Graß, T. (2008) *Schriftgestalten – Über scrift und gestaltung*. Sulgen: Niggli

Gregory, R. L. (1987) T*he Oxford Companion to the Mind*. Oxford: Oxford University Press

Grey, N. & Nash, R. (1976) *Nineteenth Century Ornamented Typefaces*. New edn. London: Faber & Faber.

Hanington, B. (2003) Methods in the Making: A perspective on the state of human research in design. *Design Issues, 19*(4), 9–18

Hansard, T. C. (1841) *Treatises on Printing and Type-Founding*. Edinburgh: Adam and Charles Black

Harland, R. (2011) The Dimensions of Graphic Design and its Spheres of Influence. *Design Issues, 27*(1), 21–34

Hartz, S. L. (1958) An Approach to Type Designing. *The Penrose Annual 52*, 39–42

Harvey, M. (1996) *Creative Lettering Today*. London: A&C Black

Hersch, R. D. (1993) *Visual and Technical Aspects of Type*. Cambridge: Cambridge University Press

Hess, S. (1972) *The Modification of Letterforms*. New York: Art Direction Book Company

Heylighen, A., Cavallin, H. & Bianchin, M. (2009) Design in Mind. *Design Issues, 25*(1), 94–105

Hofstadter A. and Kuhns R. (1976) *Philosophies of Art and Beauty – Selected readings in aesthetics from Plato to Heidegger*. Chicago: University of Chicago Press

Hu, C. & Hersch, R. (2001) Parameterizable fonts based on shape components. *IEEE Computer Graphics & Applications, 21*(3), 70–85

Hunter Middleton, R. (1965) *An Essay on the Forgotten Art of the Punchcutter.* California: University of California

Hutchings, R. S. (1963) *The Western Heritage of Type Design*. London: Cory, Adams & Mackay Ltd.

Hutt, A. (1972) *Fournier – the compleat typographer*. London: Muller

http://www.fontbureau.com/historical/ChaunceyGriffith/

http://www.fontbureau.com/historical/WilliamDwiggins/

James, W. (1890/1950) *The Principles of Psychology: Volume one*. New York: Dover

James, W. (1890/1950) *The Principles of Psychology: Volume two*. New York: Dover

Jammes, A. (1965) Académisme et Typographie – The making of the Romain du Roi. *Journal of the Printing Historical Society 1*, 71–95

Jarma, M. (2003) *Form and Proportion in a Text Typeface: A few guidelines*. Retrieved from: http://www.typeculture.com

Jaspert, W. P., Berry, W. T. & Johnson, A. F. (1983) *Encyclopaedia of Typefaces* (rev. ed.). London: Blandford

Johnson, A. F. (1966) *Type Designs* (3rd revised ed.). London: Andre Deutsch

Johnston, E. (1935) *Writing & Illuminating & Lettering* (16th ed.). London: Pitman.

Kapr, A. (1983) *The Art of Lettering – The history, anatomy, and aesthetics of the roman letterforms*. München: Saur

Karow, P. (1987) *Digital Format for Typefaces*. Hamburg: URW Verlag

Karow, P. (1998) Two decades of typographic research at URW: A retrospective, Lecture Notes. *Computer Science, 1375*, 265–280 Springer

Keinonen, T. (2009) Immediate and Remote Design of Complex Environments. *Design Issues, 25*(2), 62–74

Kinross, R. (1992) *Modern Typography: An essay in critical history.* London: Hyphen Press

King, E. (1999) *New Faces: type design in the first decade of device-independent digital typesetting (1987-1997)*. Doctoral Thesis

Kolko, J. (2009) Abductive Thinking and Sensemaking: The drivers of design synthesis. *Design Issues, 26*(1), 15–28

Klein, M., Schwemer-Scheddin, Y. & Spiekermann, E. (1991) *Type & Typographers*. London: Architecture Design and Technology Press

Knuth, D. E. (1986) *Computers and typesetting/E – Computer Modern Typefaces*. Reading: Addison Wesley

Kvale, S. & Brinkmann, S. (2008) I*nterViews: Learning the craft of qualitative research interviewing*. (2nd ed.). London: Sage

Labuz, R. (1988) *Typography & Typesetting, Type Design and Manipulation Using Today's Technology. New York: Van Nostrand Reinhold*

Lawson, A. (1990) *Anatomy of a Typeface.* London: Hamish Hamilton

Lawson, B. (1997) *How Designers Think: The design process demystified* (3rd revised ed.). Oxford: Architectural Press

Lawson, B. (2003) Schemata, Gambits and Precedent: Some factors in design expertise. *Expertise in design, Design thinking symposium 6*, University of Technology, Sydney, Sydney: Creativity & Cognition Studios Press, 37–50

Lawson, B. (2004) *What Designers Know*. Oxford: Architectural Press

Leach, M. (1960) *Letter Design in the Graphic Arts*. New York: Reinhold Publishing Corporation

Legros, L. A. & Grant, J. C. (1916) *Typographical Printing Surfaces – The technology and mechanism of their production*. London: Longmans, Green and Co.

Lemon, D. (2005) *Basic Type 1 Hinting*. <http://www.adobe.com/type>

Lommen, M. (2003) *Bram de Does – Typographer and type designer*. Amsterdam: Uitgeverij De Buitenkant Publishers

Mardersteig, G. (Translated by Mosley, J.) (2005) Alberti and the revival of the roman letter. *Typography Papers 6*, 49–65

Margolin, V. (2010) Doctoral Education in Design: Problems and Prospects. *Design Issues, 26*(3), 70–78

Marples, D. (1960) *The Decisions of Engineering Design*. London: Institute of Engineering Design.

McDonnell, J., Lloyd, P. & Valkenburg, R. (2003) Encouraging the Development of Design Expertise through the Construction of Video Stories about the Design Process. In Cross N. & Edmonds E. (Chairs) *Proceedings of Design Thinking Research Symposium 6: Expertise in Design*. Sidney: University of Technology.

McDonnell, J. & Lloyd, P. (Eds.) (2009) *About Designing: Analyzing design meetings*. London: CRC Press

McLean, R. (1995) *Typographers on type*. London: Lund Humphries.

McMurtrie, D. C. (1924) *American Type Design in the Twentieth Century – With specimens of the outstanding types produced during this period*. Chicago: Robert O. Ballou

McRae, J. F. (1920) *Two Centuries of Typefounding – Annals of the letter foundry established by William Caslon in Chiswell Street, London, in the year 1720*. London: H. W. Caslon & Co. Ltd.

Macmillan, N. (2006) *An A–Z of Type Designers*. London: Laurence King.

Meggs, P. B. & McKelvey, R. (2000) *Revival of the Fittest – Digital versions of classic typefaces*. New York: RC Publications

Middendorp, J. (2004) *Dutch Type*. Rotterdam: 010 Publishers

Middendorp, J. (Ed). (2010) *Creative Characters – The MyFonts interviews, vol. 1*. Amsterdam: BIS

Moran, D. (2000) *Introduction to Phenomenology*. London: Routledge

Morris, R. A. & André, J. (1991) *Raster Imaging and Digital Typography II*. Cambridge: Cambridge University Press

Mosley, J. English Vernacular – A study in traditional letterforms. *Motif 11(4)*, 3–55, Winter 1963

Morison, S. (1926) *Type Designs of the Past and Present*. London: The Fleuron Ltd.

Morison, S. (1949) *The Typographic Arts: Two Lectures*. London: The Sylvan Press

Morison, S. (1968) *Letterforms, Typographical and Scriptorial: two essays on their classification, history and bibliography*. London: Nattali & Maurice

Moxon, J. (1676) *Regulae Trium Ordinum Literarum Typographicarum; or the Rules of the Three Orders of Print Letters, viz.: the Roman, Italick, English, – Capitals and Small; showing how they are compounded of Geometrick Figures and mostly made by Rule and Compass. Useful for Writing Masters, Painters Carvers, Masons and others that are Lovers of Curiosity*. London: Sign of the Atlas

Moye, S. (1995) *Fontographer – Type by Design*. New York: MIS Press

Narváez, L. M. J. (2000) Design's Own Knowledge. *Design Issues, 16*(1), 36–51

Nelson, H. G., and Stolterman, E. (2012). *The Design Way: Intentional Change in an Unpredictable World*. Cambridge and London: MIT Press

Newell, A. & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.

Newland, P. M. (1990) *Understanding designers' knowledge acquisition processes: a potential for enhancing information transfer*. Portsmouth: Portsmouth Polytechnic (Doctoral Thesis)

Noordzij, G. (2000) *Letterletter – An inconsistent collection of tentative theories that do not claim any other authority than that of common sense*. Point Roberts, WA & Vancouver, BC: Hartley and Marks Publishers Inc.

Noordzij, G. (2005) *The Stroke – Theory of writing*. London: Hyphen Press.

Osterer, H. & Stamm, P. (Eds.) (2009) *Adrian Frutiger – Typefaces: The complete works*. Basel: Birkhäuser

Pardoe, F. E. (1975) John Baskerville of Birmingham – Letter-founder & printer. London: Muller

Patton, M. Q. (2002) *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks/London/NewDelhi: Sage

Pike, K. L. (1967) *Language in relation to a unified theory of the structure of human behavior*. The Hague, Mouton & Co.

Plaat, F. (Translation)(1960) *Wolgang Fugger's Handwriting Manual – Entitled, A practical and well-grounded formulary for divers fair hands, compiled by Wolfgang Fugger citizen of Nuremberg 1553.* London: Oxford University Press

Polanyi, M. (1967) *The tacit dimension*. London: Routledge and Kegan Paul

Polanyi, M. (1969) *Knowing and Being*. London: Routledge & Kegan Paul

Polanyi, M. (1973) *Personal Knowledge – Towards a post-critical philosophy*. London: Routledge & Kegan Paul

Popovic, V. (2003) General Strategic Knowledge Models Connections and Expertise Development in Product Design. In Cross N. & Edmonds E. (Chairs) *Proceedings of Design Thinking Research Symposium 6: Expertise in Design.* Sidney: University of Technology

Pye, D. (1968) *The Nature and Art of Workmanship*. London; Cambridge University Press

Rathgeb, M. (2006) *Otl Aicher*. London: Phaidon

Russell, B. (2009) *History of Western Philosophy*. London: Routledge

Reber, A. S. (1993) *Implicit Learning and Tacit Knowledge – An essay on the cognitive unconscious*. New York: Oxford University Press

Reed, T. B. (1952) *A history of the old English letter foundries: with notes, historical and bibliographical* (new ed. revised.). London: Faber

Rotenstreich, N. (1977) *Theory and Practice – An Essay in Human Intentionalities*.The Hague: Martinus Nijhoff

Rust C. (2004) Design Enquiry: Tacit knowledge and invention in science. *Design Issues, 20*(4), 76–85

Ruggles, L. (1983) *Letterform Design Systems. Technical Report STAN-CS-83971*. Department of Computer Science, Stanford University

Sassoon, R. (Ed.) (1993) *Computers and Typography*. Oxford: Intellect Books

Sassoon, R. (Ed.) (2002) *Computers and Typography 2*. Bristol: Intellect Books

Scarfe, L. (1954) *Alphabets: written and printed letter forms*. London: Batsford

Schön, D. (1985) T*he Design Studio – An exploration of its traditions and potential*. London: RIBA

Schön, D. (1991) *The Reflective Practitioner – How professionals think in action*. Aldershot: Ashgate

Schneider, U. (1998) DaType: A Stroke-Based Typeface Design System. *Computers & Graphics, 22*(4), 515–516.

Sennett, R. (2008) *The Craftsman*. London: Allen Lane

Silver, R. G. (1965) *Typefounding in America, 1787–1825.* Charlottesville: University Press of Virginia

Silverman, D. (2006) *Interpreting Qualitative Data* (3rd ed.). London: Sage

Sitala, R. (2000) *A Theory of Precedent: From Analytical Positivism to a Post-Analytical Philosophy of Law*. Oxford: Hart Publishing

Smiejers, F. (1997) *Counterpunch: Making Type in the Sixteenth Century, Designing Typefaces Now*. London: Hyphen.

Smiejers, F. (2003) *Type Now plus Work so Far*. London: Hyphen

Smitshuijzen AbiFarès, H. (2007) *Typographic Matchmaking – Building cultural bridges with typeface design*. Amsterdam: Bis

Southall, R. (2005) *Printer's Type in the Twentieth Century: Manufacturing and design methods*. London: The British Library

Spencer, H. (1969) *The Visible Word: Problems of Legibility* (2nd ed.). London: Lund Humphries

Stienberg, S. H. (1961) *Five Hundred Years of Printing* (2nd ed.). Middlesex: Penguin

Stones, C. & Cassidy, T. (2010) Seeing and discovering: how do student designers reinterpret sketches and digital marks during graphic design ideation? *Design Studies, 31*(5), 439–460

Strauss, A. & Corbin, J. (Eds.) (1997) *Grounded Theory in Practice*. Thousand Oaks, CA: Sage.

Strauss, A. & Corbin, J. (1998) *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.

Tan, S. & Melles, G. (2010) An activity theory focused case study of graphic designers' tool-mediated activities during the conceptual design phase. *Design Studies, 31*(5), 461–478

Tory, G., (1529) *Champ Fleury* – Electronic resource retrieved from: http://www.archive.org/details/fre_b1888652

Tracy, W. (1986) *Letters of Credit – A View of Type Design*. London: Gordon Fraser.

The Monotype Recorder – *Fifty years of type-cutting 1900–1950. 39*(2)

The Monotype Recorder – *Commemorating the exhibition of Lettering and Type Designs by Eric Gill held at the Monotype House, London in October 1958*. *41*(3) 1958

Tulving, E. (1972) Episodic and Semantic Memory in Tulving & Donaldson *Organization of Memory* (Eds). New York: Academic Press. 382–402

Updike, D.B. (1937) *Printing Types, Their History, Forms and Use – A Study in Survivals* (2nd ed.). London: Oxford University Press

Unger, G. (2005) *While You're Reading*. New York: Mark Batty

Van Krimpen, J. (1957) *On Designing and Devising Type*. New York: The Typophiles

Van Krimpen, J., Hofer, P., & Dreyfus, J. (1972). *A letter to Philip Hofer on Certain Problems Connected with the Mechanical Cutting of Punches*. Boston: David R. Godine

Van Veggel, R. J. F. M. (2005) Where the Two Sides of Ethnography Collide. *Design Issues, 21*(3), 3–16

Vanderlands R., Licko, Z. & Gray, M. E. (1993) *Emigre – Graphic Design into the Digital Realm*. New York: Van Nostrand Reinhold

Wallis, L.W. (1999) Legros & Grant: the typographical connection. *Journal of the Printing Historical Society 28*, 5–39

Wang, D. & Ilhan, A O. (2009) Holding Creativity Together: A sociological theory of the design professions. *Design Studies, 25*(1), 5–21

Wylant, B. (2008) Design Thinking and the Experience of Innovation. *Design Issues, 24*(2), 3–14

Zapf, H. (1970) *About Alphabets – Some marginal notes on type design*. Cambridge (MASS); London: MIT Press

Zapf, H. (1993) About micro-typography and the hz-program. *Electronic Publishing, 6*(3), 283–288

Glossary

Glossary

Text typeface design

Apex

The 'peak' of a letter such as often found on the pointed top of the uppercase A.

Arm

The horizontal extension of a letter, often from the vertical stem such as found on the uppercase E, F, L etc.

Ascender

The part of lowercase letters that protrudes above the x-height. (see x-height)

Baseline

The invisible line on which the characters in a typeface sit. (The imaginary line upon which the uppercase letters appear sit is often a useful way to visualise the baseline within a typeface design.)

Bowl

The curved extension of a letter, often adjoined to an upright stem, that forms a loop with an often enclosed 'counter'. For example letters such as b, B, d, D, p, P have bowls with counters.

Bracket

Curves that connect and partly form the serif and adjoining stroke. (In this sense the word bracket refers to a 'bracketed serif', not the symbol of a bracket in terms of parentheses)

Cap height

The height from the baseline to the top of the uppercase letters.

Character

Commonly used to indicate a letterform, numeral or symbol (see Glyph).

Counter

The internal space within a type-form, often completely enclosed by a bowl (see examples under Bowl). The term counter or counter-space is derived from the early process of type-founding, whereby the punch-cutter of types would create a 'counter-punch' in order to strike the end of a bar or rod of metal, this would form a 'counter'. It was around this 'negative' counter shape that the punch-cutter would shape the letterform for the punch.

Descender

The part of a lowercase letter that descends below the baseline.

Diacritical marks

For example, a mark used above, below or through a letter to indicate stress or pronunciation, eg: ç ö è etc.

Display typeface

A typeface that has been designed to work optimally at larger point sizes. These can often have decorative qualities or details. At small point sizes display typefaces may not render well in terms of legibility.

Extrapolation

To extend a known variable state toward an estimated variable state. In typeface design for example, to develop a variant relational weight of character or typeface design from a pre-existing weight.

Finial

Often 'shaped' ending to a letter stroke/terminal such as can be found on the overhanging elements of the lowercase a, f, r etc. within many serif typeface designs.

Fitting

This term refers to the spacing of letters relative to their side bearings (see Side bearing) and each letter to one another. Historically, this would relate to the positioning of letters relative to the metal body on which they sat (also termed justifying), leaving enough space either side of the letter so that when combined with other letters in a sequence for printing, these would appear to sit correctly.

Font

A font is sometimes referred to as a collection of characters of one typeface design but can include a suite of typeface designs, realted or unrelated (see Font family and Type family).

Font family

A font family is sometimes referred to as a collection of characters of a typeface design. This can include related variants, eg. Roman, Bold, Italic etc. See Type-family, these terms are often used interchangeably.

Glyph

Glyph is used to indicate a single character within a font. This can be a letterform, punctuation, numeral or symbol etc.

Interpolation

To create or interpret a new set or sequence of values that are relational between two known or given nodal variables. For example in typeface design, creating a medium weight by interpolating between a lightweight and heavyweight character or character set.

Italic

A slanting or script-like variant of a typeface. Upright variants are usually referred to as roman.

Latin

The standard character set for most Western and Central European language bases and other languages derived from these.

Leg

The down-stroke found in letters such as k, K and R.

Point

A unit of typographic measurement. There are approximately 72 points to the inch. One digital postscript point is equal to 0.353mm.

Point size

The measurement usually given for type. This is often the height of the 'body' or space upon which the letter sits (traditionally, the literal height of the cast metal body of an individual type).

Roman

The upright version of a typeface. Often considered the normal or average variant of a typeface design.

Sans serif

A typeface without serifs.

Serif

Small strokes included at the terminals of the main strokes of a letter.

Shoulder

The curved stroke that extends from the upright stem found in letters such as lowercase h, n and m.

Side bearing

The space designed to work either side of an individual letter, numeral or symbol.

Spacing

With respect to typography, spacing refers to word spacing and letter spacing, the latter is often associated with side bearings (see above) in typeface design.

Spine

The main diagonal stroke found in letters such as lowercase 's' and uppercase 'S'.

Stem

The main, often upright strokes of a letterform.

Stroke

The constituent structural parts of a letterform. The term is derived from letterforms constructed by traditional writing methods, eg. Pen, brush, reed and stylus etc. forms. The influence of the kind of writing tool and the incidence in which that this would by applied in practice is considered in many typeface designs.

Terminal

The terminating end of a stroke.

Text typeface

Type specifically designed to be set and read as continuous reading matter usually set at small sizes eg. 9, 10, 11, 12pt (generally below 14pt).

Type family

A collection of typefaces designed to work together and usually sharing common attributes across several related variants eg. Roman, Bold, Italic etc. (see also Font family).

Typeface

Letters, numbers, and/or symbols of collectively relational character design. A typeface can also be part of a larger group of related sets of designs eg. bold, italic etc. Traditionally in metal type, the typeface was literally the design on the raised face of the type used as the surface from which a printed impression would be made.

Width

One of the possible variations of a typeface design. Condensed and expanded are examples of width variants.

Weight

The relative boldness or darkness of characters considered as variants of a typeface design. For example: light, bold, extra-bold, and black.

x-height

Traditionally the height of the lowercase letter x. It can also be referred to as the height of the body of lowercase letters in a font, excluding the ascenders and descenders. X-heights may vary greatly in different typefaces yet still having the same point size.

Grounded Theory Methodology – general

Category

An analytic unit that conceptually organizes phenomenon in relation to the prior or continuing process of coding. A category may also arise from the organisation of groups of categories or the relation between categories and codes through a process of sorting.

Code

A literal or conceptual label used to tag and identify an item or section of specific interest within collected data.

Coding

The arrangement and systematisation of ideas, concepts, and categorisation through the application of codes to the data.

Constant Comparison

A key method as part of the Grounded Theory Methodology by which the researcher constantly compares incidents, codes, categories and themes in the emerging analysis and theory development.

Core category

A thematic, conceptual/theoretical category within (or around) which other related developed categories are organized. A Core Category 'resolves' a group of theoretically related coded and categorised phenomena.

Dimension

The property of a code or category where two or more relational properties are identified as attributable phenomena specific to such a code or category.

Memoing

The act of recording reflective notes, concepts etc. as a result of studying the collected data in order to develop conceptual/theoretical meaning and interpretation.

Sorting

The process of organising the developing theory from memoing and coding/categorizing stages through to the writing stages of Grounded Theory Methodology.

Theoretical sampling

Sampling determined on the basis of the emerging themes, concepts and theory development from analysis of the data.

Grounded Theory – developed theory in this research

Accretive Amelioration

The holistic improvement of design over a period of time and the result of multiple interventions that combine to 'resolve' in a design, not merely producing a design with the intention of problem-solving.

Attenuating

Accounts for the ways in which expert designers continuously and critically test and adjust for incongruity in developing text typeface designs.

Constructed Precedent

An initiating form with potential to inform subsequent form.

Contextualizing

The use of singular or multiple known or exiting precedent(s) relative to situating and initiating the text typeface design, affording orientation of initial design trajectory. Contextualizing may be defined from the outset of a process of design or can emerge along with and within the initiating process of design.

Empathic Memoing

A method developed by the author of this research that allows for insight to develop via enacted experience – through practice for example – relative to phenomena identified within the data, in order that reflective notes, concepts etc. emerge that aid and develop analysis and theory development.

Endogenous Generator

A form that is specifically and purposefully utilised within a developing scheme of design in order to generate further relational form.

Envisioning

Where the expert designer identifies themselves, their ability, skill and judgment as a contributing factor, significant in the development and improvement of design.

Historical Immersion

Accounts for the ways in which designers' historical and contextual subject knowledge directly contributes to the ways in which they Attenuate.

Homologizing

Phenomena relating to the development of relational form within the processes of text typeface design.

Synthetic Acquiescence

A dimension of Homologizing related to Extrapolation and Interpolation, whereby the designer allows a design, or part of a design, to be created wholly by means of an automated software and/or programming routine.

Synthetic Displacement

A dimension of Homologizing related to Extrapolation and Interpolation, whereby a designer imposes manual intervention in adjusting a design or part of a design that would otherwise be derived wholly by automation via software and/or programming.

Trajectorizing

The various purposive beginnings and initiations relative to the processes of designing text typefaces.

Appendices

Expanded from 3.3.9 – Grounded Theory perspectives

The term Grounded Theory was originated by Barney Glaser and Anslem Strauss in 1967, in their book *The Discovery of Grounded Theory – Strategies for Qualitative Research*. The book argues for a systematic yet flexible approach toward a general research methodology (Glaser & Strauss 1967). The original version of Grounded Theory Methodology set out by Glaser and Strauss, is claimed by some (eg. Bryant & Charmaz 2007) to espouse a broadly objectivist/positivistic, approach. In response, and to clarify and refine understanding of the methodology, Glaser published the *Theoretical Sensitivity* (1978). This elucidates and elaborates on the original text by working more as a guide to the methodology. Strauss and Corbin's book *Basics of Qualitative Research* (1998) offered a distinct variation of the method and although largely still espousing a positivistic approach, this offered further developed rationale toward coding conventions – axial coding – and introduced a conditional matrix to map actions and conditions against which emphasize verification (Given 2008, p.376). Charmaz (2006) *Constructing Grounded Theory* and Bryant & Charmaz (2007) offer a constructivist approach to what they see as earlier objectivist/positivist methods.
These latter approaches retain key facets of the earlier methods – coding data, emerging categories, developing concepts, memoing and constant comparison but the position is taken that the researcher has an active role in constructing the research at each level. Charmaz argues that: 'a constructivist approach places priority on the phenomena of the study and sees both data and analyst as created from shared experiences'. (Charmaz 2006 p.130)

Arguments with regard to positivist or constructivist views of Grounded Theory Methodology are nuanced and often based upon the type of language used to describe the approach. However, Glaser has also argued that other perspectives and approaches miss the point of what Grounded Theory Methodology is, and that such remodelling of the methodology reduces it merely to a form of Qualitative Descriptive Analysis, which he argues it is not:

> Constructivist GT is a misnomer. GT can use any data; it remains to figure out what it is … It means exactly what is going on in the research scene is the data, whatever the source, whether interviews, observations,

> documents, in whatever combination. It is not only what is being told, how it is being told and the conditions of its being told (Glaser 2003, p.167).

Glaser also argues that Charmaz's claim for Constructivist Grounded Theory is 'too simple a statement' (Glaser 2003, p.168) and that with respect to the original form of Grounded Theory 'The constant comparative method discovers the latent pattern in the multiple participant's words' (Glaser 2003, p.169). The point that Glaser makes is that Grounded Theory Methodology deals with multivariate data. It is through the constant comparison, coding, memoing etc. that patterns emerge, and that 'the GT focus is on the conceptualization of latent patterns' (Glaser 2003, p.169). Indeed with reference to arguments as to whether Grounded Theory Methodology is either positivist or constructivist, Glaser himself can be quoted within *Theoretical Sensitivity* as describing part of the Grounded Theory Methodology involving 'constructing', well before the likes of Charmaz and Bryant etc. use the term:

> the analyst enters the field to collect the data, his[/her] method of collection and codification of the data, his[/her] integrating of the categories, generating memos, and constructing theory (Glaser 1978, p.2).

In terms of this study, the author acknowledges that the use of terms such as positivist or constructivist over simplify a methodology that allows for multivariate data to be compared, coded and analysed, terms not associated with the methodology itself but imported from other methodologies and theoretical perspectives. Glaser claims this as 'all is data' (2003, p.167). This then creates a reflexive position from which analysis and theory can be produced based upon the researcher's own interpretations as well as testimony of the participants (Charmaz 2006, p.130). However, it is the constant comparison of data, coding, memoing and raising concepts that develop from the latent patterns within the data that in turn become Grounded Theory. This research adopts a Grounded Theory Methodology that draws from the positions of Glaser as originator and subsequent developer of Grounded Theory Methodology whilst acknowledging the contributions and offerings that others have made.

Consent form

I understand that I have given my consent to be interviewed about my current practices with regard to the processes of type design. My interview will be recorded and documentary evidence that illustrates my approach to the working processes of type design will be collected as agreed.

I understand that my involvement in this study, and any collected data will remain strictly confidential. This will only be shared with the supervisors of this project for relevant evaluation purposes. I also understand that data will be archived to DVD on completion of this project and will not be used in any other way without further written consent.

I have read, and been given a copy to keep, the information supplied regarding this research project in which I have been invited to participate.

What is going to happen and why it is being done has been explained to me and I have been given the opportunity to discuss the details of this and ask questions.

Having given my consent, I understand that I have the right to withdraw from the research programme at any time without any disadvantage and without giving any reason.

I hereby fully and freely consent to participation in the study that has been fully explained to me.

Name of Participant (please print):

……

Participant's signature:

…… Date: ……

Principal staff/research student's name (please print):

……

Principal staff/research student's signature:

…… Date: ……

Name of witness (please print):

……

Witness' signature:

…… Date: ……

Consent form/Ethical approval
Documentation produced to inform and enlist participants as part of this study, and to comply with university ethical approval procedure.

Interview guide

Conversational/open approach

Themes for discussion:

How does a typeface begin?

Factors that influence the shaping of letters

Historic or contemporary references if any

Control characters – the sequence of the design of characters if any
(How does this begin and for what reasons? How does this continue?)

Design and testing – the relationship between designing and testing
(Where does this begin and how does it continue?)

Spacing – side bearings, kerning etc.

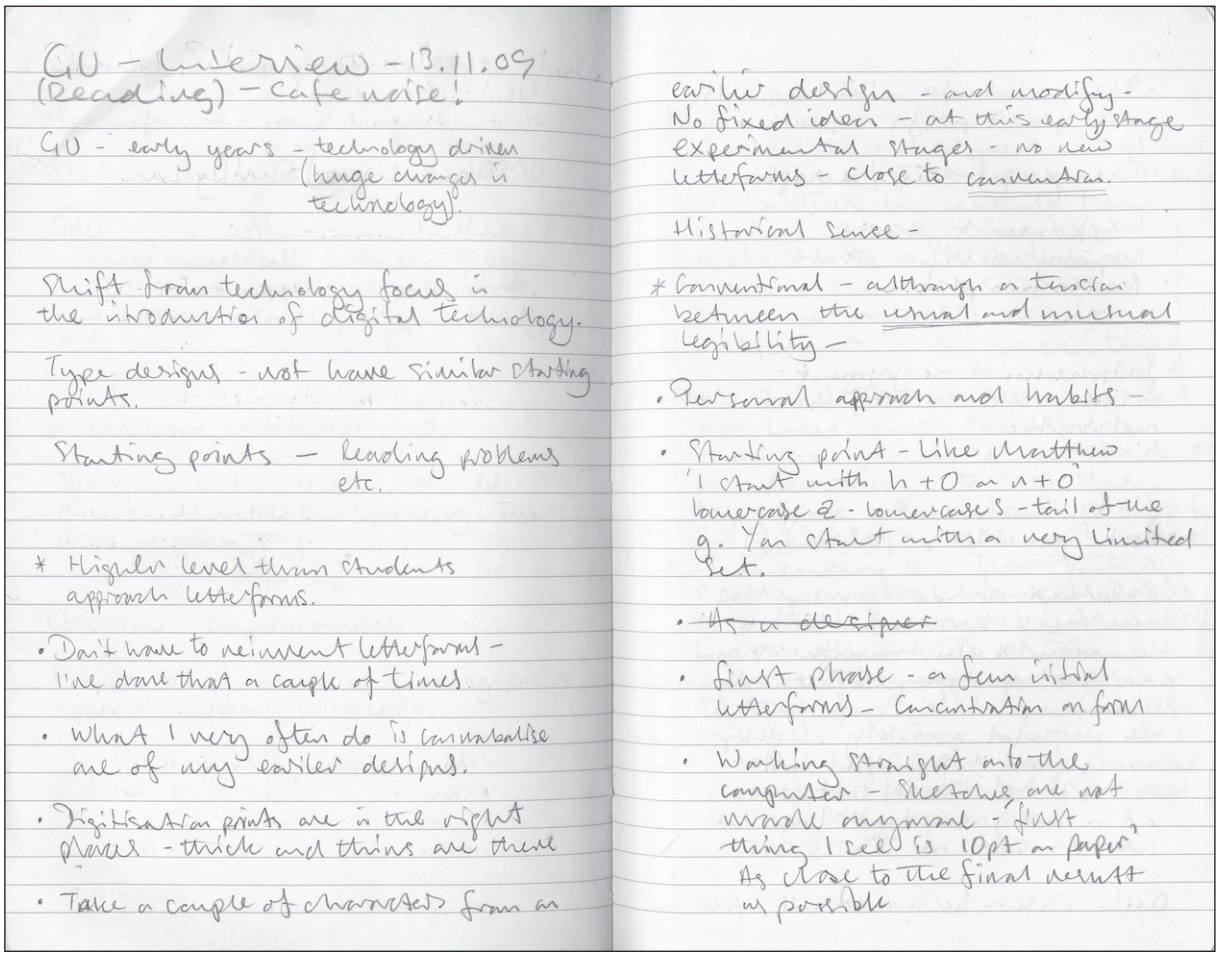
Hinting

Variants and weights etc.

What factors or decisions determine the success of the design

The role of technology and its influence if any on the design

Interview guide/schedule
Interview guide produced in order to outline broad themes to be covered within the interviews.



GU – Interview – 13.11.09
(Reading) – cafe noise!

GU – early years – technology driven (huge changes in technology).

Shift from technology focus in the introduction of digital technology.

Type designs – not have similar starting points.

Starting points – Reading problems etc.

* Higher level than students approach letterforms.

• Don't have to reinvent letterforms – I've done that a couple of times.

• What I very often do is cannabalise one of my earlier designs.

• Digitisation points are in the right places – thick and thins are there

• Take a couple of characters from an earlier design – and modify – No fixed idea – at this early stage experimental stages – no new letterforms – close to conventions.

Historical sense –

* Conventional – although a tension between the visual and structural legibility –

• Personal approach and habits –

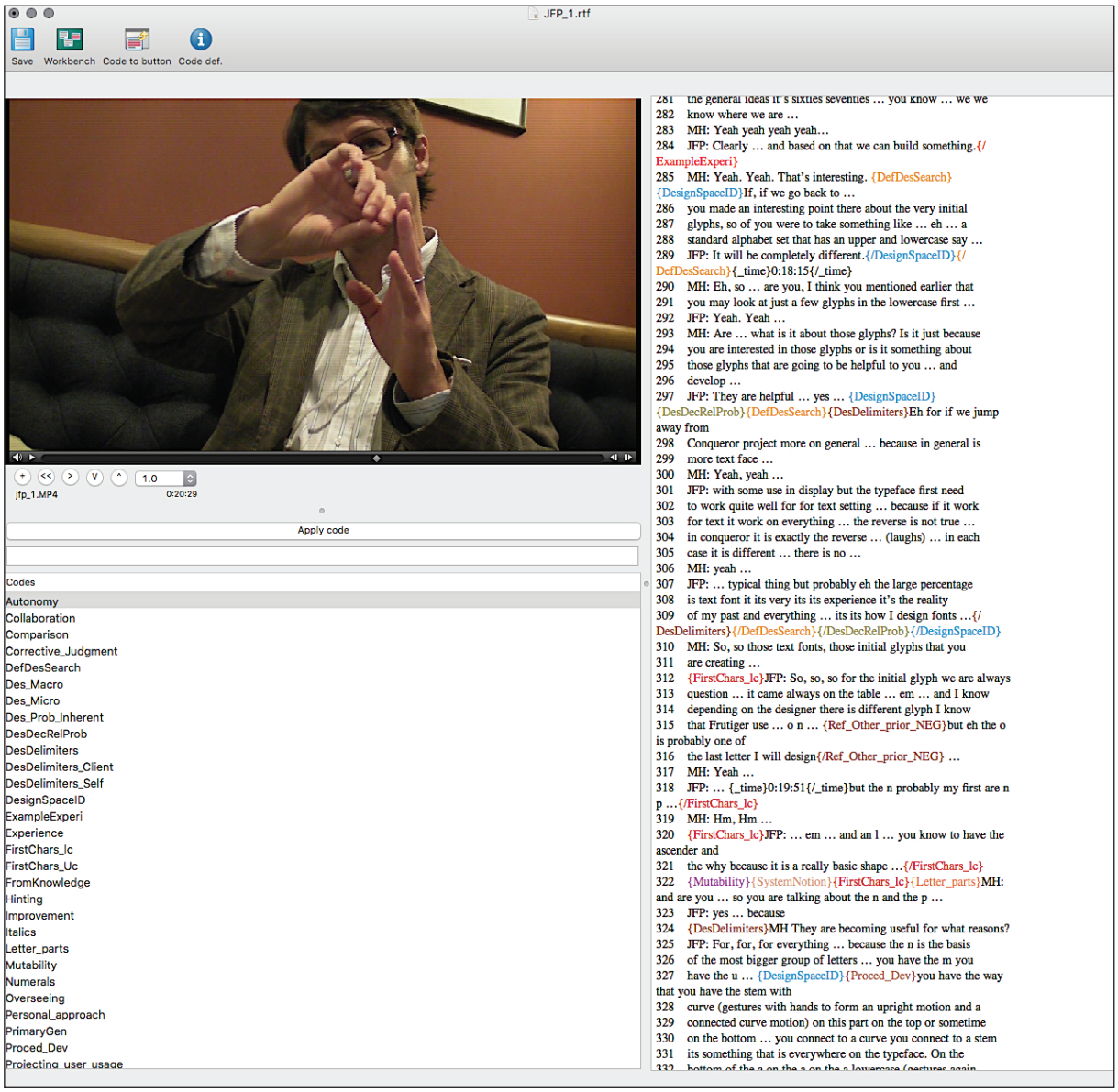
• Starting point – like Matthew 'I start with h + O or n + O' lowercase e – lowercase s – tail of the g. You start with a very limited set.

• ~~As a designer~~

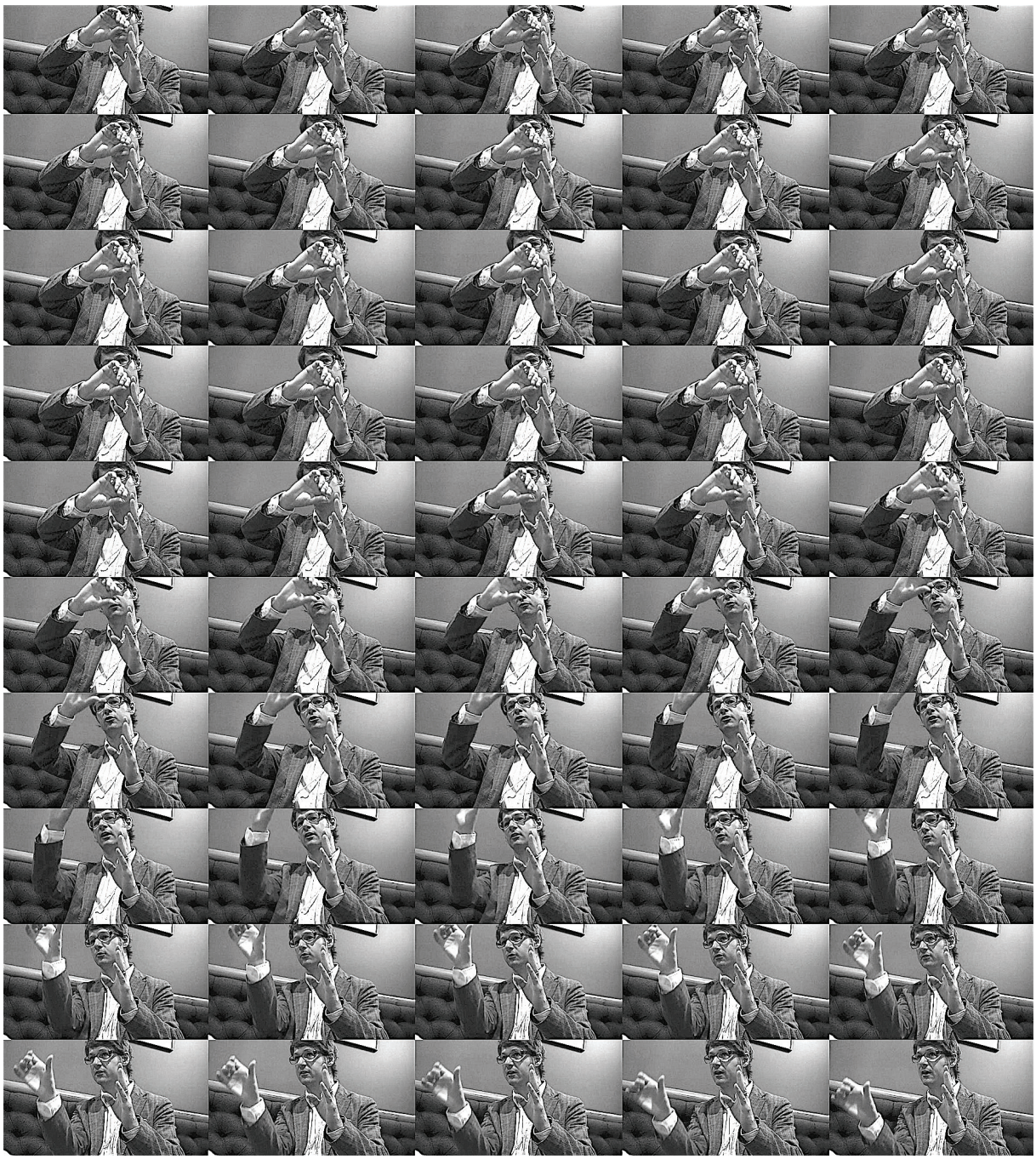
• First phase – a few initial letterforms – Concentration on form

• Working straight onto the computer – Sketches are not much original – first thing I see is 10pt on paper, As close to the final result as possible

Example: Field notes
Field notes were taken during interviews to aid with gathering and understanding data as the research progressed



Example: Transcribed and coded interview
The above example shows the transcribed interview data as text alongside the recorded, filmed interview. Below the film media file, the list of developed codes can be seen. The combination of elements are seen together within the TAMS Analyzer software package.



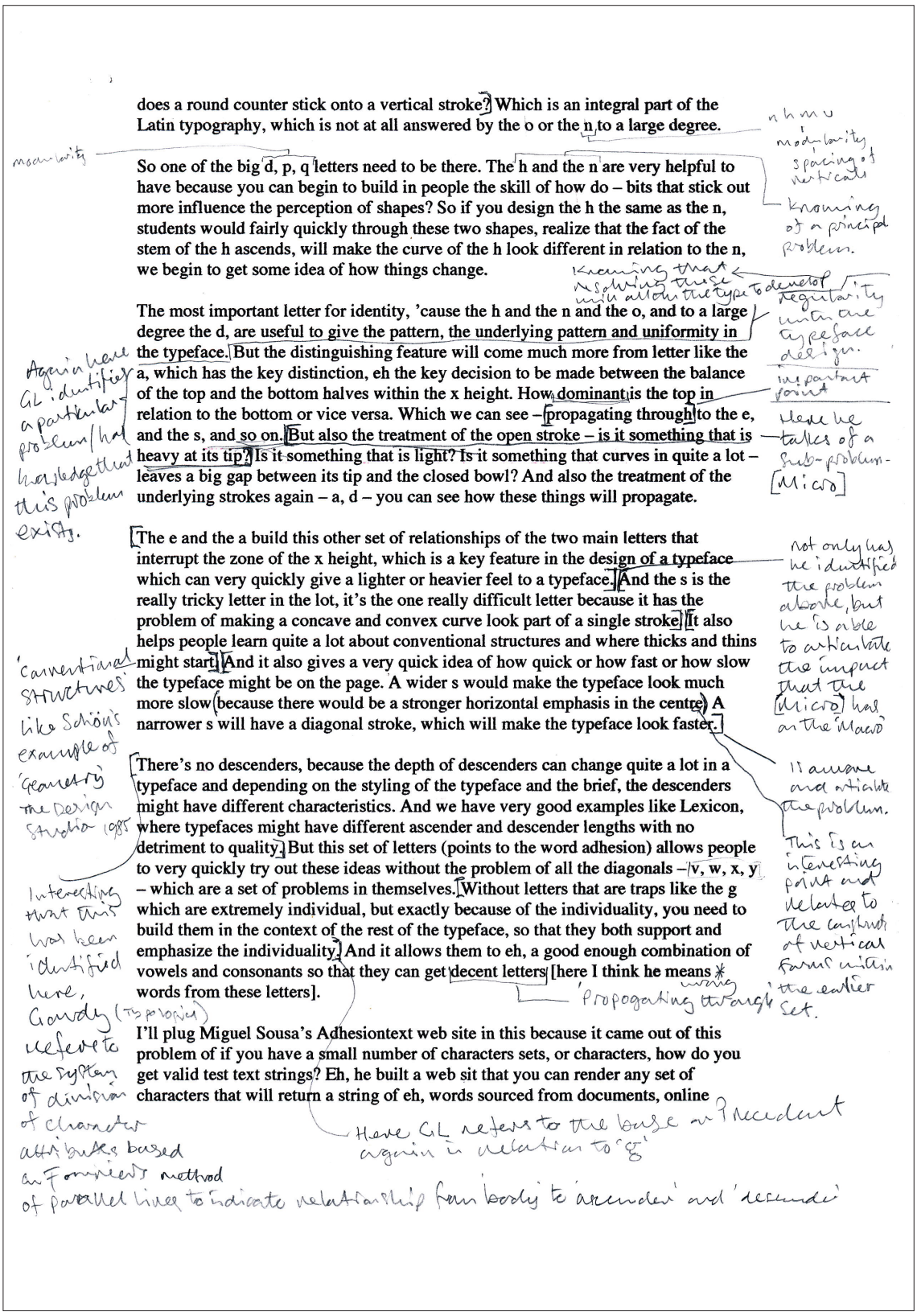
Example: Detail from filmed interview
The method of filming interviews afforded the author the ability to observe details recorded at the time in relation to the transcription with respect to analysis. The example above shows the participant describing the connection between curved and upright strokes of the lowercase n as an important feature of the developing typeface design. Sequence is from 00:20:29 to 00:20:31 relating to JFP_1 file.

TAMS Analyzer description

TAMS stands for Text Analysis Markup System. *TAMS Analyzer* is a software program for coding and analysing qualitative, textual and audiovisual information including interviews, observations/field notes/ videos etc. It was created by Dr. Matthew Weinstein, Assoc. Professor of Science Ed., University of Washington-Tacoma. *TAMS Analyzer* is a native Open Source, Qualitative Research Tool designed for the Macintosh computer. The program also includes full support for transcription. Further information can be found here: http://tamsys.sourceforge.net/

The software aided in refining transcriptions in this research as well as allowing the author to tag codes to transcriptions whilst tracking video playback. The software also allowed for assigning codes that the author generated in this research in relation to the developing grounded theory. Once codes were tagged within the transcription, the data and codes then became indexed and searchable. The software aided the constant comparative nature of Grounded Theory Methodology analysis and theory generation via its powerful database features. This allowed for comparison of data to data, code to data and code to code to be made. Codes were also grouped within the software to allow for categories and concepts to be developed and finally organised. In turn, the software also allowed for the organised codes etc. to be 'grounded' in and by the data, again, in-line with Grounded Theory Methodology.

TAMS Analyzer
A brief description of the qualitative data analysis software, TAMS (Text Analysis Markup System) Analyzer and its use in this research.



does a round counter stick onto a vertical stroke? Which is an integral part of the Latin typography, which is not at all answered by the o or the n to a large degree.

So one of the big d, p, q letters need to be there. The h and the n are very helpful to have because you can begin to build in people the skill of how do – bits that stick out more influence the perception of shapes? So if you design the h the same as the n, students would fairly quickly through these two shapes, realize that the fact of the stem of the h ascends, will make the curve of the h look different in relation to the n, we begin to get some idea of how things change.

The most important letter for identity, 'cause the h and the n and the o, and to a large degree the d, are useful to give the pattern, the underlying pattern and uniformity in the typeface. But the distinguishing feature will come much more from letter like the a, which has the key distinction, eh the key decision to be made between the balance of the top and the bottom halves within the x height. How dominant is the top in relation to the bottom or vice versa. Which we can see – propagating through to the e, and the s, and so on. But also the treatment of the open stroke – is it something that is heavy at its tip? Is it something that is light? Is it something that curves in quite a lot – leaves a big gap between its tip and the closed bowl? And also the treatment of the underlying strokes again – a, d – you can see how these things will propagate.

The e and the a build this other set of relationships of the two main letters that interrupt the zone of the x height, which is a key feature in the design of a typeface which can very quickly give a lighter or heavier feel to a typeface. And the s is the really tricky letter in the lot, it's the one really difficult letter because it has the problem of making a concave and convex curve look part of a single stroke. It also helps people learn quite a lot about conventional structures and where thicks and thins might start. And it also gives a very quick idea of how quick or how fast or how slow the typeface might be on the page. A wider s would make the typeface look much more slow (because there would be a stronger horizontal emphasis in the centre) A narrower s will have a diagonal stroke, which will make the typeface look faster.

There's no descenders, because the depth of descenders can change quite a lot in a typeface and depending on the styling of the typeface and the brief, the descenders might have different characteristics. And we have very good examples like Lexicon, where typefaces might have different ascender and descender lengths with no detriment to quality. But this set of letters (points to the word adhesion) allows people to very quickly try out these ideas without the problem of all the diagonals –/v, w, x, y – which are a set of problems in themselves. Without letters that are traps like the g which are extremely individual, but exactly because of the individuality, you need to build them in the context of the rest of the typeface, so that they both support and emphasize the individuality. And it allows them to eh, a good enough combination of vowels and consonants so that they can get decent letters [here I think he means * words from these letters].

I'll plug Miguel Sousa's Adhesiontext web site in this because it came out of this problem of if you have a small number of characters sets, or characters, how do you get valid test text strings? Eh, he built a web sit that you can render any set of characters that will return a string of eh, words sourced from documents, online

Example: Early initial coding of data
Initial coding began as thoughts and reflections written as marginal notes alongside the early transcribed text. This was then developed into more formal coding structures.

List of codes and definitions

Autonomy: Participant describes having/needing to have a single view of design process/decision-making

Collaboration: Participant describes aspects of design collaboration with another designer(s)

Comparison: Participant describes making comparisons within the process of designing type

Corrective Judgment: Participant describes making judgments in identifying and improving elements perceived to be incongruous in relation to the overall design of the typeface

DefDesSearch: Participant Defining the search space (heuristic)

Des Macro: Participant describes/acknowledges details relating to a macro level view/notion of design

Des Micro: Participant describes/acknowledges details relating to a micro level view/notion of design

Des Prob Inherent: Participant identifies an inherent problem/area in approaching text typeface design

DesDecRelProb: Participant describes Design decision related to problem

DesDelimiters: Participant outlining the design perimeters for specific problem(s) – general

DesDelimiters Client: Participant describes Client outlining the design perimeters for specific problem(s)

DesDelimiters Self: Participant describes Self outlining the design perimeters for specific problem(s)

DesignSpaceID: Participant identifies distinction in approach to design.

ExampleExperi: Participant Gives account of specific design example from experience

Experience: Participant identifies an element where experience/ability/appreciation bears upon the process of designing type.

FirstChars lc: Participant describes Letters designed initially for the lowercase.

FirstChars Uc: Participant describes Letters designed initially for the UPPERCASE.

FromKnowledge: Participant Drawing from prior knowledge – initially declarative

Hinting: Participant describes hinting within the process of designing or producing type

Improvement: Participant describes decision making in terms of Improvement

Italics: Participant describes italic forms in the process of creating type

Letter parts: Participant describes/is aware of the component parts that make up letterform

Mutability: Participant describes mutable differences in similar character shapes

Numerals: Participant describes development of numerals

Overseeing: Participant describes the importance of a single person's overview in relation to collaborative work.

Personal approach: Participant offers opinion or thinking toward personal approach or philosophy of design

PrimaryGen: Participant describes Initial design influence or influence prior to the process of design

Proced Dev: Participant's Statement shows insight to procedural development of design

Projecting user usage: participant projects how the design may may used

Punctuation: Participant describes development of punctuation

Redefining brief: Participant describes scenario where the client brief is redefined

Ref Act Design learn: Participant references the Act of 'doing' design and learning through 'doing'

Ref Context: Participant referring to context (of use) as important in the development of the typeface design

Ref Conv Broad: Participant makes reference to broad or general established method or pattern of description/classification

Ref Conv Spec: Participant makes SPECIFIC reference to methods/methodologies/practices etc. that inform conventional notions of the subject. Eg. the use of the broad-nib pen in calligraphy informing the oblique axis of a typeface design etc.

Ref Epistemic Prob: Participant makes reference to inherent problems relating to subject epistemology

Ref Know Hist Cont: Participant refers to knowledge/influence of history and context of subject area

Ref Originality: Participant makes reference to originality in work

Ref Other prior: Participant states making reference to OTHER prior work to develop the typeface design

Ref Other prior NEG: Participant states NOT making reference to OTHER prior work to develop the typeface design

Ref Own Prior: Participant states making reference to their OWN prior work to develop the typeface design

Ref Own Prior NEG: Participant states NOT making reference to their OWN prior work to develop the typeface design

Ref Reflection learning: Participant makes reference to reflection/learning

Repertoire: Participant indicates that an existing repertoire of actions or decision making in relation to type design is used.

Repertoire Neg: Participant indicates that an existing repertoire of actions or decision making in relation to type design is not used.

Skillset prior non TD: Participant makes reference to non typeface design prior knowledge or skill set as being important

Spacing: Participant describes SPACING of characters

SystemNotion: Participant describes or intimates Notion of, or reference to a system or framework

Tech as tool: Participant describes using technology as a tool in the process or generation of design

Tech Constrain: Participant describes constraining effects of technology and how this affects design development in some way

Testing: Participant describes testing of characters eg. introduced to form words etc.

Variants: Participant describes consideration of other design variants in the design process

Working Phase: Participant identifies discrete phases in the process of designing type

Resolved codes
The fifty-three resolved codes and their definitions developed from the analysis in this study.

Memo

Auto-hermeneutical

Date: June 2013

Notes:

Theoria	Poiesis	Praxis
Theory	Transformational Skilful Manufacture	Action The Act of doing

'Auto-hermeneutical' – itself revealing/self-revealing
The direction of interpretation

Theoria	Poiesis	Praxis
Describe	Prescribe Predict	Actuate

Memo
Until the design reaches a point where it becomes self-informing, the precedent or precedents take the form of 'Auto-hermeneutical precedents' within the design process.

This is a working of the design often drawing upon existing influences directly or indirectly until the point where the designer is satisfied with what has been produced at that stage will inform the typeface design. This may be restricted to just a few characters initially (MC's DNA) that the designer knows that this will successfully allow development of the other characters.

It is then that this can be described as the stage of the 'endogenous generation'. Endogenous generation occurs when the initial influence of the external precedents have help the design shape a form or forms. This form or forms are then 'Actuated', legitimised as form themselves in the view of the designer. It is when this 'actuated' form then becomes the influence internal to the system of design that the 'endogenous generator' is active. This new form contains what Matthew Carter describes as the 'DNA' of the typeface design.

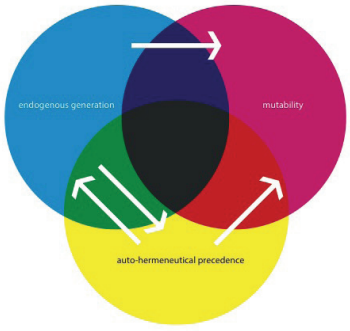
It is the combination of the stages of the 'auto-hermeneutical precedence' and 'endogenous generation' that allows the direction and flow of the system or process of type design to develop.

An example here is when Matthew Carter explains about starting with 'something in the background' or Robin Nicholas describes basing and idea or concept on something or parts of things that have gone before. Using a limited set of characters, designers/type design experts then work on these until satisfied that this will allow the typeface design to develop. The elements such as curves, arches, strokes etc., not only define and construct the type – they describe the possibility of the type design – they also become the 'endogenous generators' for the remaining, developing design, whether it is lowercase, uppercase etc.

The 'endogenous generator' appears when an 'instance' or influence from the 'hermeneutical precedent' is 'situated' or 'actuated'.

For example, the curve or modulation within a stroke may become a precedent for the way strokes appear within a new design – once situated. E.g. in the initial 'n' for example – this then becomes an 'internal' or 'endogenous' generator for the behaviour of curves in other letterforms – m, h, u etc. Depending upon the particular design this may also influence further sets of letterforms directly – b, d, p, q etc. However, as mentioned this may well depend upon the kind of design developed.

Groupings are identified, however, it is something 'endogenous' in relation to the qualities of the particular designed initial characters that allow for subsequent propagation/generation.



Example: Memoing
The memo as theoretical snap-shot in this example shows what eventually became a discarded theoretical theme: Auto-Hermeneutical Precedence.

However, this memo was an important step in developing the resolved theory presented in this research, as it allowed for the concepts Endogenous Generation and Mutability to develop.