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Where is the mind of the media editor?

An analysis of editors as intermediaries between technology and the cinematic experience.

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Abstract

What space does the mind occupy? A standard response to this question might be to locate the mind within the brain. However some argue that our mental processes also extend beyond the boundaries of the brain. Gallagher & Zahavi (2008) have termed these two views of the mind: internalism and externalism. In cinema, the role of editor as mediator between the cognitive activities of filmmakers, audiences and the editing equipment, makes their practice particularly suited for investigating these two seemingly incompatible views. When editors cut or join chunks of sound and image, they assemble externally what some would recognise internally as the mind's fluctuations between one object of attention and the next. Their activities reveal a side of cinema, but also of the mind, which is usually hidden from view. The purpose of this thesis will therefore be to show how studying the process of editing contributes to our understanding of the relationship between mind and world.

In order to address the question of where the editor's mental processes are located, this study applies a phenomenographic methodology. Rather than attempt to understand cognition from a preconceived or objectively constituted position, phenomenography starts by examining variation in how a group of individuals view a particular process. This leads toward research findings that are presented from a 'second-order perspective' (Marton, 1981). In this thesis an understanding of how audiovisual material is selected and sequenced is revealed through fourteen interviews with British editors and directors. From the analysis of these interviews a framework emerged of five critical interrelated ways to approach the editing process. This evidence suggests that the cognitive process occurs in virtue of an editor's physical activities, the editing equipment, plus a broader network of social and cultural relations that support the filmmaking environment. Refuting the belief that the mind is separate from the world, the editor's mental processes are to be found distributed amongst a variety of internal and external features of their environment.

The outcome of this thesis is a phenomenographic perspective on the editing process. This, I conclude, will help to inform cognitive scientists of the kinds of mental processes that editors are aware of. It also provides a wider audience of scholars with a framework for further research on variation in the process and practice of editing.

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Introduction

0.1 Preface – Editing in the Real World

There are a number of ways to understand the kind of thinking that goes on in and around the editing environment. As an editor myself, I am interested not only in the understanding presented by other editors and filmmakers, but also in the philosophical concepts used to explain how consciousness and technology are related. However, my own experience of spatial and temporal mislocation during the editing process was what first caused me to think more about what the editing practice might reveal about our relationship to the world and, moreover, about the capacity that the process and practice of editing presents for transforming our awareness of the world.

As far as I was concerned, I was working in the production company's editing suite, but when I turned away from the screen I became aware, all too quickly, that I was in fact at my desk in my flat, two miles away from where I thought I had been. This experience, despite its brevity, was disorientating, and even though, on the one hand, it was easy to dismiss it as a brief lapse in my short-term memory, I also felt a mixture of unease and curiosity in relation to my everyday assumption that where I think I am is where I am. For if I had not been where I thought I had been – where had I been?

My initial response to this problem was to reflect on the experience in relation to what I had been doing. I had been working every evening that week, digitising and logging the rushes for a documentary series called *CSI Wild*. It was a fairly monotonous, time-consuming job and a relatively typical task for an assistant editor. I had decided to take the six remaining tapes home and complete them there. It was now five in the morning. The unusual hours I was keeping – arriving at the company's offices at 6pm and leaving at around 2am – were also fairly typical for an assistant editor, whose job of preparing the rushes that the editor will work with is often carried out in the hours when the rest of the office has gone home, or when the company's editing equipment is not in use. Consequently, I was tired due to a lack of sleep. However, had I really spent two hours thinking I was somewhere I was not?

Despite this uneasy state of mind, as I reflected on the experience, I could see its connection to aspects of cinematic storytelling and, in particular,

the editing process: from the selection and sequencing of particular elements of an event, to editing devices such as temporal ellipsis. In short, excluding relatively insignificant events from a narrative is something editors do. At the same time, it has been said that editing in films is something we hardly notice unless it is done badly (Kermode, 2015). And this is precisely the insight offered by my brief moment of spatial and temporal mislocation; my experience of the event appeared to have been noticeably edited. Some of the evening's events had been cut out, while others, made available by a range of conscious experiences, were joined together.

A similar, and perhaps more familiar, example of a continuity error occurring in everyday life is cited by the philosopher Daniel Dennett (1969, 1991). He provides the example of a driver who emerges from the depths of a conversation or his own inner machinations and is surprised to discover that he has no memory of where he has been driving, or, more pressingly, ever being in control of his vehicle. Questions inevitably arise for the driver, such as: 'How did I get here?' 'What happened on the road?' 'Did I shoot any red lights?' and 'What else did I miss?' This is a phenomenon that has been explained by Dennett and others as 'unconscious perception with intelligent action' (Dennett, 1969: 117) or, more recently, as an instance of 'rolling consciousness with swift memory loss' (Dennett, 1991: 137).

Nathaniel Dorsky (2005), a proponent of 'devotional cinema', refers to this same example as a case of 'intermittent awareness'. He believes that our relationship to the world around us is far more punctuated than we would care to admit. And in relation to the cinematic experience, he believes that we are so accustomed to this intermittence that, were it absent from an edited film, we would find its likeness to our familiar experience unconvincing:

> In a sense, for film to be true, it has to trust this intermittence. Its montage has to present a succession of visual events that are sparing enough, and at the same time poignant enough, to allow the viewer's most basic sense of existence to "fill in the blanks." If a film fills in too much, it violates our experience. (Dorsky, 2005: 29)

Verisimilitude between what our relationship to the world is like and what it is like to watch films is achieved, according to Dorsky, when filmmakers

recognise that we continually cut and join aspects of our environment throughout our everyday experience. From here, another related way to understand my experience of mislocation emerges. It could have been that I was so absorbed in my task at the editing desk that I had simply 'cut out' – for a brief moment in time – any information related to my location. The screen images had focused my attention to the point where I had inadvertently disregarded the change in my environment and effectively edited out my journey home, temporarily forgetting where I was and assuming myself to be where I wasn't. That moment, when my attention was focused intently upon the task at hand, could be termed 'being in the zone' or being in the 'flow'. Now a part of everyday speech, a theory of 'flow' was developed by Mihaly Csikszentmihalyi in 1975 to describe a state of concentration said to be so engaging and so exhilarating that one's sense of time duration is altered and the usual concerns of the self and one's surroundings evaporate.

Csikszentmihalyi (1996: 112) studied 'flow' in athletes, musicians and 'creative people', and he describes their experience of '[stepping] out of the boundaries of the ego and [of becoming] part, at least temporarily of a larger entity'. Interestingly, some editors also described similar-sounding experiences in relation to their own practices:

> Editors will continually refer to that "other consciousness" that taps a source of inspiration far beyond common sense. To enter this dimension, editors have to become absorbed in the film and the cutting so that time, personal problems, the entire room disappear. (Oldham, 1992: 6)

There is a strange paradox here; there is clearly a visual aspect to these activities and yet, despite engaging intently with them, an awareness of where they are located might slip from view. Editors, in other words, appear to engage with some aspects of the world that can be seen, while other aspects of the practice are active but unseen. If one considers what editors do in order to assemble sequences of audiovisual material – viewing footage on a screen, conceiving of a system through which the material might be brought to order, visualising or imagining the assembled sequence as it plays out, cutting and assembling the actual material, watching, reflecting on and re-watching the se-

quence, and, if necessary, reordering and reassembling the material – how could aspects of the individual and their location disappear from this process? And where, if we consider this, might we find the active cognitive features that are responsible for this process?

When I worked as an assistant editor, I was able to observe experienced editors demonstrating speed and precision in what they did. However, it appeared that they did not necessarily have to look at the equipment they were operating. It appeared that they were able to carry out some of the aforementioned activities (reordering and reassembling of editing material, etc.) without any interruption to the intentional flow between themselves and their editing interface. The same could be said of the daydreaming driver (Dennett, 1991; Dorsky, 2005), or the athlete who is in the 'flow' (Csikszentmihalyi, 1975, 1990): at a certain level of competence and attention or intensity of concentration, there is a shift in how the tool user experiences that technology. At the same time, in spite of or via this technological activity, their awareness of the world surrounding them might also undergo a transformation. What these examples of 'intermittent awareness' and 'flow' indicate is that our relationship to our environment, in particular the tools we operate within it, can be far from fixed. Instead, this relationship appears to fluctuate between what is visible and what is not.

This idea that our relationship with technology is not fixed, that our awareness of tools as objects fluctuates, was put forward by Martin Heidegger (1927) through his analysis of tool use. According to Heidegger, 'where something is put to use', our awareness of the object 'withdraws' and our relationship to it as 'equipment' becomes available, hence 'tools-in-use become phenomenologically transparent' (Wheeler, 2011), or when we use equipment 'it has a tendency to disappear' (Rowlands, 2010: 158). Heidegger's analysis of tool use famously collapses the distinction between subject and object (Ihde, 2010). Subsequently, we are presented with an understanding of the relationship between tool and tool user, not as two distinct parts of the world, but as one way of being-in-the-world.

A potential consequence of this fluid view towards the boundaries between tool and tool user is that how we come to know the world, or what we make of the world, has the potential to be transformed in conjunction with the

characteristics of the tool that is in use. For instance, Turkle (2004: 26), in her study of the relationship between self and technology, states that 'the tools we use to think, change the way in which we think'. Meanwhile, the editor Walter Murch (2001: 43) suggests that the 'tools you edit with can have a determining effect on the final product'. These are both salient points when one considers the changes that have occurred in the production and the consumption of moving images over the last 50 years.

From my own understanding, the most recognisable of these changes would be that:

- Recording and projection technologies have evolved from analogue to digital.
- There has been an increase in the availability and portability of moving image technologies.
- These technological changes have affected the structures of workflow for post-production, distribution and projection.

Identifying or evaluating the impact of these changes, from a position working within the post-production environment, for me, resulted in a fairly loose understanding of what an editor's experience can reveal about our relationship to technology.

While working as an editor, I found that some people working within post-production held the view that, despite the range of new technological capabilities and the diminishing costs of hardware and software, some questionable practices had accompanied the development of cinematic technology. The consideration being taken when recording or documenting experience was seen by some to be in decline. Widespread use of the phrase 'fix it in post' typifies this position. A culture has emerged in which poor production skills or decision making have become acceptable, only because the editor and the editing technology are now able to accommodate these mistakes. But, at the same time, these new capabilities appeared to extend the network of possibilities imagined by the filmmaker and editor in relation to the audiovisual material. I also noticed that these changes led to an increase in the number of tasks (from colour grading to visual effects, previously outside their professional remit) expected of editors. Hence, the motivation underlying this thesis is to conduct a more rigorous investigation of the editor's thinking and the editing environment.

What interests me most about the experiences and ideas described above are the direct challenge they present to the notion that how we think about the world is in some way fixed, or that our thinking is fixed to a particular location. It appears that not only can an awareness of self and objects be driven by our beliefs about what we are doing in the world (which in itself is bound to fluctuate), but we are also driven to do things in a particular way as a result of the tools we use.

0.2 The World Within and the World Outside

The continuity, or lack thereof, described above – between our physical location and what we experience as thoughts or perceptions within this environment – inspires fundamental questions about our understanding of the mind. To some, it may appear that the ideas we carry about the world or that drive our decision-making process are independent of the un-thinking matter we find ourselves surrounded by. Hence, the qualitative distinctions between a subject's perceptual experience and the objective world have led to what William James described as 'one long wrangle over the paradox that what is evidently one reality should be in two places at once, both in outer space and in a person's mind' (James, 1904: 481).

In this respect, what is 'in a person's mind' could be considered an internal representation of the world. These representations are experienced as thoughts, perceptions, memories or beliefs. Traditional cognitive science has been driven by a view of the mind where 'perceptual processes in the brain create detailed inner representations of the external environment' (Menary, 2006: 3). However, in recent years, a 'new science of the mind' has emerged that does not locate mental processes or states 'exclusively in the head' (Rowlands, 2010: 1–2). This view is partly a critique of the internal, neural micro focus adopted by much of cognitive science and is partly a condensation of the insights revealed to us through the phenomenological tradition.

This new approach to the study of mental processes is driven by a shift in philosophical discourse from the question 'what is the mind?' to the question 'where is the mind?' This debate presents us with two opposing positions regarding the location of mind and is characterised by the terms internalism and

externalism (Gallagher & Zahavi, 2012). Internalists locate mental processes entirely within the mind of a subject. These processes, according to internalist thought, occur independent of the subject's environment. Thus, internalists present an understanding of cognition that is located exclusively within the structures and activities of the brain. Externalism, on the other hand, proposes that mental processes are also driven by the subject's environment, and thus 'experience depends upon factors that are also external to the subject' (Gallagher & Zahavi, 2012: 139). For example, Clark (2003: 11) suggests that we should seek to understand human thought and reason by studying the 'looping interactions between material brains, material bodies and complex cultural and technological environments'.

The structure of this debate can be seen to be of particular interest to the arts (Manzotti, 2011). However, the 'kind of matching of inner and outer environments' (McLuhan, 1968: 92) that makes up the artistic experience should also be of value to cognitive science. Of particular interest – and the focus of this thesis – is the relationship between the mind and cinema. With cinematic technology, we are able to record unfolding audiovisual phenomena that were, prior to film's invention, only ever experienced from one subject's viewpoint. The images recorded on film and video present a realistic semblance of how we see movement in the world 'out there': motion observed and recorded from what might appear to be one person's perspective, or even multiple perspectives. As well as combining sounds and images to communicate ideas as one would with collage, the process of editing can be employed to represent a sequence of events as they might appear to mind from one moment to the next. Matching together what appears to mind with how it appears to mind has been claimed by some to be the primary objective of film editing. As Ernest Lindgren famously proposed:

> … the fundamental psychological justification for editing as a method of representing the physical world around us lies in the fact that it reproduces the mental process in which one image follows another as our attention is drawn to this point and to that in our surroundings. In so far as the film is photographic and reproduces movement, it can give us a life-like semblance of what we see; in so far as it employs editing, it can reproduce the manner in which we normally see it. (Lindgren, 1948: 213)

Underlying the relationship between the way we experience the world and what is represented on screen are a set of processes – usually hidden from the audience – that order the images presented to us on the screen. It is the premise of this thesis that uncovering these processes will provide a way to understand more about the cinematic experience.

By framing this investigation from the perspective of the editor, this thesis seeks to reveal some of the hidden processes that bring cinema to the screen. As one editor in an online forum put it, 'a film is made in the edit suite; before that, you just have ideas and raw footage' (TheactweacT, 2015). But the editor sits between more than just ideas and raw footage; in many projects there are in fact a range of tools and elements (from script to soundtrack) and people whose thinking is shared, directly or indirectly, with the editor while they carry out their work. It appears, therefore, that editors are situated appropriately, *in media res*, to bridge our understanding of how internal awareness and external media are linked.

In contrast to actor-network theory, which uses the term 'intermediary' to distinguish a closed process, 'where input predicts output', from the uncertainties of a process that is open to the actions of a 'mediator' (Latour, 2005: 57), the term 'intermediary', as it is used in the title of this thesis, establishes the case for investigating the actions connecting people and technologies within the editing environment. Positioning the editor as an intermediary between the filmmakers' thinking, the technology of filmmaking, and what appears on screen is not intended to diminish their active role in the filmmaking process. On the contrary, the value of this intermediary position lies in the knowledge of how the editor's activities manage to unite those of all the other participants in the filmmaking process and to bring cohesion to raw footage that they are presented with. Rather than provide a fragmentary account of cinema's constituent parts, the analytical skills of the editor could provide insight into the actions that match the filmmakers' inner and outer worlds, as they occur during the editing process.

Maurice Merleau-Ponty sets an appropriate philosophical pretext for this investigation into editors as intermediaries between technology and the cinematic experience, in his 1947 essay *Film and the New Psychology*. For Merleau-

Ponty 'the world and the thought it indicates' should not be correlated by separate 'methods of interior observation and physiological psychology' (1964: 53). He characterises his philosophical project as; 'an attempt to make us *see* the bond between subject and world, between subject and others, rather than to *explain* it as the classical philosophies did' and in this he finds cinema as; 'peculiarly suited to make manifest the union of mind and body, mind and world, and the expression of one in the other.' (1964: 58) While Merleau-Ponty's essay pioneered the argument for treating cinema as a philosophical project, this proposition should be distinguished from the claims that certain film narratives raise philosophical issues or can be used to record philosophical arguments (Wartenberg, 2009). According to Merleau-Ponty (1964: 59) "if philosophy is in harmony with cinema, if thought and technical effort are heading in the same direction, it is because the philosopher and the moviemaker share a certain way of being, a certain view of the world'. In this context what special insight might the editor's experience of the filmmaking process reveal? At the end of *Film and the New Psychology* Merleau-Ponty contemplates whether cinema will eventually show that, 'modes of thought correspond to technical methods and that, to use Goethe's phrase, "What is inside is also outside."' (1964: 59) Given an intimate understanding of both technological processes and a filmmaker's thinking, if anyone will be in a position to comment on this correspondence it will be the editor.

At the heart of it the central question of this thesis brings into focus a debate between internalist and externalist views of the mind, and related disputes over which structures constitute the mind. Herein, the process and practice of editing can be linked to a range of philosophical ideas underlying 'the new science of mind' (Rowlands, 2010: 1). Some of these ideas, such as 'active externalism' (Clark & Chalmers, 1998), claim that elements of our environment play an active role in our mental processes. Some, such as 'distributed cognition' (Hutchins, 1995), present an understanding of thinking that extends beyond the boundaries of objects and is instead shared between a network of relations. And some, such as 'situated aesthetics' (Manzotti, 2011) and 'extensionism' (Pepperell, 2011), challenge the idea that our experience of art is reducible to independent objects or events. These ideas support fields of study committed to investigating mental process beyond a context limited to neural activity

alone. Activities in and around the editing environment appear to invite a similar approach.

Overall, then, this thesis presents a unique opportunity to situate different ways of thinking about the mind, whether internalist or externalist, in relation to the practical context provided by the process and practice of editing.

0.3 Why Study the Mind of the Editor?

The focus of this thesis will be the relationship between the mental processes involved in the practice of editing and the environment in which this process occurs. This is a departure from prevailing approaches to film studies, which since the 1960s have focused on understanding the cinematic experience from the perspective of either the director – central to auteur theory – or from the perspective of an idealised audience – central to theories of spectatorship, such as apparatus theory or feminist film theory. There are two key reasons for this: the first is that claims to understand the cinematic experience without investigating the process or place where its various features are brought together appear to be misinformed, at least partially. This is a point articulated by Stan Brakhage, who:

> [Discovered that it was] impossible to communicate certain aesthetic information to technically ignorant audiences… for there is a vast area of any art where the grammar of that art and its techniques are interrelated and even synonymous. (Brakhage, 2003/1966: 29)

By investigating activities within and around the editing environment, this thesis aims to reveal where the critical features driving the editing process are situated. However, if the cases of tool use described earlier – 'intermittent awareness' (Dorsky, 2005), 'flow' (Csikszentmihalyi, 1975, 1990), and 'phenomenological transparency' (Wheeler, 2011) – indicate our general capacity to edit out certain aspects of our everyday environment, this investigation may also help to reveal an understanding of conscious experience beyond that of cinema alone. As psychologists and philosophers James (1897) and Merleau-Ponty (1945/2012) have observed, during perception there is a selection process that leads certain objects temporarily to the foreground of our attention. This would

include the unseen objects of our imagination, as well as the objects of our surrounding environment. So, while editing is an activity usually associated with media professionals, it could be argued that the way we encounter daily life is both mediated and edited through a process that bears similarities to the specific role the editor plays in selecting and sequencing audiovisual material. Hence, a second reason to focus upon the process of editing would be the insights it might reveal about the processes underlying human perception, especially in relation to tool use. By doing so, this thesis aims to develop an understanding of the editing process and, by extension, the underlying structures behind our technologically mediated and edited encounters with the world.

The study of editing, and, similarly, any knowledge of the process and practice of editing, holds a central yet often overlooked within the world of cinema. Even though the art of cinema is in many ways defined by the editing process (Münsterberg, 1916; Arnheim, 1957; Merleau-Ponty, 1964), the editor's place in this is much neglected. In popular entertainment, editing is broadly regarded as an invisible craft. Continuity editing, in particular, which is generally considered to be the dominant style of editing in use today, is intended to go unnoticed by the general audience (Smith, 2006). Some might consider noticeable editing a distraction from a film's narration. The editor's success, therefore, could be evident in the lack of acknowledgement they receive from the general film-going public. The audience appear to have knowledge of high-profile actors or directors, but are unlikely to recall the names of any editors, let alone be able to define what it is that they do (Oldham, 1992).

While members of the public may not attempt to understand or are simply unaware what it is that the editor does, some film theorists regard editing as central to how our communication through cinema has been developed. The evolution of filmmaking techniques and film style has been recognised by some psychologists and film historians as deriving primarily from the context of the editing process (Münsterberg, 1916; Arnheim, 1957; Kracauer, 1960; Lindgren, 1948; Reisz & Miller, 1953). However the editors' practice does not appear to be central to the broad range of film theories and approaches to film analysis rooted in the tradition of critical cultural theory and, which examine cinema specifically from the framework of an idealised subject. The scope of these projects varies considerably, with some of the most respected attempting

to explain how cinema creates meaning (Mitry, 1963,1987) or why we are able to understand cinema (Metz, 1974). Despite the merits and clearly stated ambition of these projects, the latter's approach to semiotics and cinema is beyond the scope of what will be attempted in this thesis. Neither will this thesis attempt to engage in a critique of these "Grand Theories" (Bordwell & Carroll, 1996) or works of film analysis that these theories have influenced. One major problem with those investigations is that they tend to focus upon understanding cinema in a context, which only arises after the raw material and the film (edited as a whole) have been made sense of in the editing suite. And so, rather than explaining the social, psychological or technological constraints limiting the comprehension of cinema by an idealised subject, this thesis will set out to study the cognitive processes encountered during the editing of a film.

Much of the discourse around cinema overlooks the experience of the editor, excluding how an editor makes sense of the audiovisual material and how their knowledge of filmmaking technology relates to this. In her writing Vivian Sobchack (1992) has observed that the majority of discussions in film studies commence from *a priori* conceptions of mental structures, often borrowed from psychoanalysis or semiotics. The underlying problem with this, according to Sobchack, is that a separation between mind, body and technology occurs when cinema is being analysed. This leaves an important gap in our understanding of the processes that link the technology of cinema to the cinematic experience. In some cases, cognitive film theory has attempted to further our awareness of the cinematic experience by investigating how the medium works upon our minds and our minds upon it (Anderson, 1997; Bordwell, 1996; Carroll, 1996). But this research rarely extends to include an understanding of what the work of the editor is; hence, even within cognitive film theory there are 'very few detailed explanations regarding cognition of film editing' (Smith, 2006: 26).

Well-known exceptions to this oversight are the synthesis of practice and theory presented by certain filmmakers. Their work helps to reveal some of the hidden processes and structures underlying the construction of the cinematic experience. At the same time, they provide a conceptual ground for understanding the relationship between the mind and cinema. Perhaps the most famous example of these comes to us through the texts of Soviet filmmakers

working at the start of the 20th century. We find that the works of Sergei Eisenstein and Dziga Vertov in particular have had a lasting impact on the history and theory of filmmaking and, as the label 'Soviet montage' suggests, the focus of their ideas is predominantly on the editing process.

Nevertheless, understanding the work of the editor remains 'more mysterious to us than the greatest directors around' (Kermode, 2015). Theories of spectatorship and authorship have done little to explain or even analyse the editor's experiences, especially in terms of what it is like to work with audiovisual material, the methods and variety of tools they use, or even the particular sense-making capabilities of the editor. It seems, therefore, that for as long as the experiences of the intermediaries who operate between the filmmaker's imagination and the filmmaking technology are neglected, our understanding of the relationship between mind and media will remain partially obscured.

0.4 Research Approach and Researcher's Orientation

My approach to the research question will come, broadly speaking, in two stages. Firstly, through the ideas already available within the relevant literature, which frame key features of this enquiry; and secondly through investigating, via interviews with editors, editors' experiences of the editing environment and their understanding of the editing process. My approach to this second stage falls under the field of qualitative research, specifically phenomenographic research. The theory behind phenomenography, the reason for choosing this approach, and its relation to the issues raised through the literature review will be explained in Chapter 4 of this thesis. For now, it should be emphasised that the researcher's background is often considered to be an important component of qualitative research (Creswell, 2002; Patton, 2002) and that acknowledging this is recognised as a clear step towards ensuring research reliability (Sandberg, 1997). Therefore, what follows is a formal presentation of my own background, which will also serve to account for the genesis of this investigation and disclose any subjective orientation I have towards the main research question.

I am a 40-year-old Caucasian male working as an Associate Lecturer at the London College of Communication (LCC), University of the Arts London. I teach in the Contextual and Theoretical Studies department, and on Interac-

tion and Moving Image courses. Prior to working at LCC, I worked for eight years as a freelance editor and assistant editor. As well as this freelance work, I have made a few short documentaries, which I shot and edited myself. I received an art and design education at Central St Martins (CSM), University of the Arts London.

I consider my arts education to have had a large impact on my worldview. While studying as an undergraduate, I was strongly influenced by the radical experimentation of the European and American avant-garde. This occurred during a period when youth culture in the UK was still celebrating the do-it-yourself ethos that propelled the rave experience across cultural and social divisions. So, as much as cultural history alerted me to a pool of potential within audiovisual media, it seemed that the collective movement of that time provided the most appropriate context and audience for sustained audiovisual experimentation and exploration.

During my experience as a freelance editor and assistant editor, something that I found particularly affective was the intensity of my engagement with the editing equipment. A considerable factor in this was the time an editor spends in an editing suite. Most of the jobs I worked on were relatively short (compared with feature film jobs), lasting between a fortnight and a month, with the average working day lasting about seven hours. However, I noticed that, towards the end of some jobs, I would work longer and longer hours, meaning that on some days I would spend around 12 hours looking at a screen. On some of these marathon-editing sessions, I noticed that awareness of most of my bodily activity had been marginalised and that I had been focusing on only a limited array of sensory-motor actions. This produced some surprising perceptual experiences. The most memorable of these experiences included spatial mislocation (an instance of which is described in the preface to this chapter) but also 'prolonged after image' and rhythmical, ornamental entrainment relating to the editing material. Though these experiences were rare, they did rouse my interests towards what experiences other editors may encounter during their practice.

After a fuller assessment of editing as a research subject, I recognised that the primary reason for pursuing such a study would be to seek a deeper understanding of the mind. Although the art of cinema offers a particularly rich

context for the study of consciousness, perhaps due to the sheer scope of consciousness studies, the subject of consciousness is often treated with caution within an arts education. This, at least, was my experience at undergraduate level. I also felt that the practice of editing received far less attention within cinema studies than attempts to classify or interpret the meaning of an artwork, despite editing environments revealing a rich array of processes for studying our interaction with technology and the moving image. I sensed that researching our knowledge of cinema within the context of consciousness studies could make a valuable contribution to both fields. I therefore pursued the opportunity to study with Professor Robert Pepperell, whose texts *Post-Human Condition* (1995) and *Postdigital Membrane* (2000) manage to situate the study of artistic practices in relation to key debates within consciousness studies. I also hoped to work with Dr Gary Pritchard, whose research into learning environments (2006, 2008) exemplifies valid and reliable outcomes in qualitative research, data collection and analysis.

0.5 Overview of Chapters

The aim of the first three chapters will be to set the research questions within the context of current debates about the location of mind and to indicate how a study of the editing process is positioned in relation to such a debate; starting with a broad overview of the internalist–externalist debate, then focusing upon the relationship between mind and technology and then more specifically toward the relationship between mind and cinema. However the limitations of this literature call for a research methodology – presented in Chapter 4, which can be used to study current approaches to the editing process. The results of this research – evidence of what it is like to experience the editing process, will be presented and discussed in Chapter 5.

Chapter 1

Despite offering an abundance of explanations regarding the relationship between mind and world, cognitive science appears to be split by a fundamental disagreement over which parts of the world constitute our mental processes and hence where study of mental processes should begin (Clark & Chalmers, 1998;

Menary, 2010). The cause of this split will be traced to two opposing views on the significance of extension: the Cartesian theory of extension, which presents us with a view of extension as a purely physical phenomenon, separate from thought; and the theory of the extended mind, proposed by Clark and Chalmers (1998), which views extension as both physical and mental, with both contributing to the cognitive process. These two opposing views of extension provide the early foundations for the ongoing divisions between internalist and externalist thinking.

Driving the internalist view is the belief that the mind and the brain are the same thing. What is known as the mind/brain identity theory can be traced back to the idea of property dualism developed by Spinoza (Popper & Eccles, 1995). Today, the mind/brain identity theory provides a theoretical foundation for internalist projects, in that they seek to describe all mental processes in terms of neural activity. Projects discussed in this chapter include David Marr's computational theory of vision, developed in the 1970s, as well as more recent endeavours within cognitive science to find neural correlates of consciousness.

Externalist arguments against the internalist model of the mind vary. This chapter will present a selection of the most vocal critics of the internalist model, including the American pragmatists William James and John Dewey, the principal founder of phenomenology, Edmund Husserl, and the pioneer of the ecological study of perception, James J. Gibson. As such, Clark and Chalmers' paper *The Extended Mind* (1998) will be seen in the context of a long-running debate about what constitutes cognition and from where our knowledge of the world emerges. However, in order to understand how these arguments relate the mind to cinema and the process of editing, reference will be made to key studies, which instigate a closer examination of relationship between technology and our cognitive processes.

Chapter 2

The possibility that thinking could ever be linked to anything other than the brain may seem extraordinary. Indeed, according to the purely brain-centred explanation of cognition promoted by the internalist view, the idea that mental processes extend beyond the limits of the skull is quite impossible. However, just as problematic, with regards to the internalist model of the mind, is that, in

order to explain how we gain knowledge of the world, it necessitates the construction of an internal (neural) representation of our surroundings. This, according to Gibson (1979), would be a very inefficient means of engaging with our environment. A more efficient approach, in many cases, is to use our surroundings to carry a portion of the cognitive load. By doing this, we, as a species, have developed tools and have even designed environments purposefully 'to achieve goals that would otherwise be beyond us' (Clark, 1997: 194). In fact, our ability to 'offload' part of this cognitive effort onto our environment and into our technology is seen by the proponents of such an idea as one of the defining characteristics of our species.

This chapter introduces three fields of pioneering study, each investigating the processes by which cognition and technology relate. The first, developed by Lev Vygotsky (1930), focuses upon the social setting for the utility of tools and signs and the relationship between this and early psychological development. The next focuses upon our embodied relationship with technology and perceptual qualities that are, according to the analysis of objects, made apparent through tools coupled with human bodies (Merleau-Ponty, 2012; Ihde, 1986). The final field examines ecological and evolutionary approaches to understanding media technology, which were pioneered by Gibson (1966, 1979) and McLuhan (1964). From this environmental focus, we are led to the notion of situated aesthetics proposed by Manzotti (2011) and Pepperell (2011).

Across these three research fields this chapter identifies two pertinent features of tool use. From the most basic examples of tools, such as pointing sticks or drawing implements, to the more complex networks of camera users and digital technology, there are two fundamental technological outcomes that this chapter describes. The first is the act of using one object to point towards another object (or experience) and the second, related outcome is that of using tools to augment our capacity to engage effectively with our environment. Together, they highlight key features of communication and navigation that characterise the relationship between the human mind and the world.

Chapter 3

The technology of cinema has proven to be a very popular means of exploring the relationship between the mind and the world. There are views developed

by both practitioners and theorists, which, while not referring specifically to the notion of cognitive extension, could be used to support the understanding of mental processes that it helps to promote. However, not all the theories used to explain the cinematic experience follow the same externalist model of the mind. Chapter 3 will compare a number of early explanations regarding the relationship between mind and cinema.

The first half of this chapter will introduce the philosophers and psychologists who presented early analogical understandings of the relationship between the technology of cinema and the mind. These analogies run two ways: firstly, there are those that present an understanding of the mind from the perspective of cinema; and secondly, there are those that explain our comprehension of cinema from the perspective of mind. Critical analysis of the latter has been conducive to the establishment of the cognitive study of moving images (Münsterberg, 1916; Anderson, 1996; Bordwell, 2012; Carroll, 1988; Smith, 2006).

In an analysis of editors as intermediaries between technology and the cinematic experience, how might these analogical explanations be of use? What is important to understand, as far as this investigation is concerned, is whether the metaphorical perspective is formulated from a position outside of the process or from within the process. Some of the analogical explanations found within cinema studies but derived from theories outside of the cinematic process – such as those that borrow heavily from a psychoanalytical tradition (found in the film theories of Baudry (1968) and Metz (1975), for instance) – form what might be considered a *pre-given* conception of the cinematic experience. Following the existential approach of Merleau-Ponty (1964), Sobchack (1992) suggests that we find an understanding of cinema apparent prior to these intellectual preconceptions in the co-given relationship between cinematic technology and each individual's embodied intelligence. She suggests that cinematic comprehension comes from within the moment of this co-given relationship rather than from externally sourced and pre-given conceptions.

Taking the arguments of Noel Carroll (1988) and Sobchack (1992) into consideration, the second half of this chapter presents the relationship between mind and cinema from the perspectives of two filmmakers: Sergei Eisenstein and Dziga Vertov. These two filmmakers were chosen specifically because of

their interest in understanding the mind, not only through their filmmaking practice, but also through their engagement with key psychological theories of the period. Although most famous for their contribution to theories of montage, Eisenstein and Vertov provide insightful descriptions of editing processes, which clearly illustrate elements of Clark and Chalmers' extended mind thesis – however these are not in the context of the full range of filmmaking techniques practiced today. The question of mental location still needs to be investigated and evaluated within the contemporary editing environment. This needs to be addressed using an appropriate research methodology, which will generate findings that are over and above introspection or specific formulations by individual filmmakers. In short, a suitable methodology for addressing questions of mental location, the variety of ways editors currently experience their activities in the editing suite and their relationship to other (cinematic) minds.

Chapter 4

This chapter will look at why and how a phenomenographic approach to research will be applied to this investigation. The three areas that this chapter will focus upon are: a) defining and explaining the phenomenographic approach to research; b) explaining why this approach is suitable for studying the relationship between editors, the editing technology and the cinematic experience; and c) exploring how the phenomenographic approach has been applied, in this case, to the study of the process and practice of editing.

One key purpose behind this chapter is to show how phenomenography sits within the internalist–externalist debate. In particular, whether or not the pioneers of phenomenography promote an externalist view of the mind and, if so, what kind of externalist view they present. To achieve this, we will see how phenomenography compares to similar fields of study that investigate how a process and the environment in which it occurs can be understood. We will see how the 'structure of awareness' (Marton & Booth, 1997), phenomenography's analytical framework, has its theoretical foundations in what Edmund Husserl called our 'internal and external horizons of perception'. Notwithstanding their similarities, we will also see how phenomenography and phenomenology differ. When defining phenomenography's epistemological position, Marton and Booth (1997) point out that it is a field of study that deals with a similar set of

critical issues and questions to those considered in theories of situated cognition (Hutchins, 1995). Their comparison between these two fields of research draws our attention to the shortcomings of a dualistic approach to the study of mental processes and how phenomenography has attempted to avoid these shortcomings. In summary, by seeking to explain phenomenography's position within the internalist–externalist debate, we will gain a better insight into the reasons why phenomenography will be used in this study.

The final section of this chapter explains how phenomenography has been applied to investigate the mind of the editor. This is divided into two main areas: 1) the process of data collection; and 2) the analysis of this data. In the first, the rationale behind the interview sample and the interview procedure supports a description of who was interviewed and how the interviews were carried out. In the second, I will describe how the interview data was analysed and the iterative steps in this process that led to the phenomenographic 'categories of description', which will act as subheadings within the presentation of these research findings.

Chapter 5

The interviews presented in this chapter provide first-hand accounts of the editing process and the experience of the editing environment. They will provide an opportunity to show how editors perceive their role within this process and their views of how the process relates to features of filmmaking, technology and the cinematic experience. Most importantly, these interviews will allow us to examine the cognitive processes within the editor's awareness and their contribution to the construction of the cinematic experience.

This chapter will explain the context behind and the layout of the various 'categories of description' (Marton, 1994) that emerged from the analysis of the interview data. This 'second order-perspective' (Marton, 1994) extends through the examination of various themes within each of the categories of description and goes on to present an analysis of the relationship between the various aspects of the editing process. With the analytical framework of phenomenography, the presentation of the research findings will be focused towards the 'referential and structural aspects' (Marton & Booth, 1997) of the interview data. The structural focus of this approach will apprehend a view towards the in-

ternal and external aspects of the relevant processes occurring in and around the editing environment. Hence, the research findings as they are presented throughout this chapter endeavour to engage, at a fundamental level, with the principles concepts of the internalist–externalist debate. From the identification and evaluation of critical aspects of the editing practice, a minimum of two mental procedures related to the extended mind model of cognition are then made apparent; one that fits the environment around the filmmaker's imagination and another that responds to unexpected instances of abstraction or synthesis afforded by the filmmaking technology.

Conclusion

In the conclusion, I will argue that editing involves processes that appear to be partially driven by the editor's internal states and partially by activities external to these. Understanding the link between the internal and external aspects of cinema is shown to be a crucial feature of the editors work, the study of editing reveals how knowledge is 'given out' and 'brought forth' in both a practical and artistic context. The evidence presented in the research findings, comprising of descriptions of the editing process and analyzed in terms of the structure of awareness implied by these descriptions, can be used to support the claim that the cognitive processes are not situate exclusively within an individuals 'head' but are distributed across particular working environments. The significance of this relates to tasks beyond those of editors alone, it may incorporate activities that shape our relationship with the world and by extension our understanding of consciousness. Rather than being reduced to or studied as a purely brain-centred activity, this study concludes that we should approach consciousness as a process that is shared amongst – and should therefore be examined within the context of – environmentally distributed activities.

Chapter 1

Where is the Mind?

1. Introduction

The context of this enquiry into the mind of the media editor occurs within the long-running disputes over the relationship between mind and world, and in particular between mind and technology. Central to these disputes is the lack of any clear agreement over where the boundaries of this subject lie. Co-author of *The Extended Mind* Andy Clark (2004) points out that, despite a variety of philosophical and scientific projects that claim to study aspects of the mental, there is still no consensus regarding what the mind is. In many cases, what is being studied are a variety of mental processes, such as perceiving, remembering, thinking, reasoning and so on. But the actual notion of 'mind' is unresolved, torn between 'its roots in the idea of conscious experience and occurrent thoughts, and its extension into the realm of non-conscious processes and long-term stored knowledge' (Clark, 2004: 63). And, in the absence of a unified definition or coherent understanding (even within cognitive science) of what the mind is, we also find an unresolved dispute as to where these mental processes occur. Where, ask Clark and Chalmers (1998), does the mind stop and the rest of the world begin? In the face of indeterminate boundaries between a world of supposedly non-conscious processes and conscious mental experience, a dispute has arisen over the distribution of cognitive processes between the activity of neurons and their surrounding environment. Central to this dispute is the reassessment of previously held assumptions regarding the active role that technology plays within mental processes.

If the questions posed in Clark and Chalmers' extended mind thesis (1998) amount to a shift in philosophical discourse from the question 'what is the mind?' to the question 'where is the mind?', then one way to frame the dispute regarding the problem of locating mental processes lies between the opposing poles of internalism and externalism. A variety of claims emerge from each of these poles but, broadly speaking, the internalist position views a subject's beliefs and experiences as being entirely constituted by 'what goes on inside the mind of that subject' (Gallagher & Zahavi, 2012: 139). Some internal-

ists would, therefore, argue that it is not our natural or cultural environment that we are conscious of, but 'internal representations' of that environment, formed through mental processes (Churchland, 1996; Crick & Koch, 1998; Frith, 2007). Furthermore, there is a popular view within cognitive science that mental processes and neural processes are identical; thus, all mental processes are believed to be realised exclusively by neural processes occurring in the brain (Place, 1956; Feigl, 1958). Opposing this view is the externalist position, which posits that mental processes are not just located in the brain, extending beyond the head to the body and, in some cases, throughout the subject's environment (Gallagher & Zahavi, 2012). The externalist view proposes that a subject's experience is not only constituted by the activity of the brain, but also by their physical, social and cultural environment (Clark, 2003). In brief, the externalist claim counteracts the internalist view in that the mind exists within the discrete spatial boundaries of the skull and is composed of a tangible substance, reducible to the activity of neurons in the brain.

The aim of this chapter, then, is to present some of the literature that examines the constitution of mind in terms of processes that are either internal or external to the subject, or both, and thus the opposing arguments between the internalist and externalist views of the mind. The chapter will begin with reference to the Cartesian theory of extension, the theory holding that the mind is non-physical and non-extended (AT 8a). Many have recognised this idea as a catalyst for the so-called 'mind–body problem', and its assumptions continue to exert a strong influence on the philosophy of mind (Blackburn, 1999; Rowlands, 2010). Even though few now favour the substance dualism offered by the Cartesian perspective, the Cartesian theory of extension has played a key role in shaping the arguments of both the internalist and externalist positions.

1.1 The Relationship Between Mind and World

1.1.1 Cartesian Theory of Extension

In the philosophy of mind, the distinction between physical bodies and non-physical minds is often attributed to René Descartes (1596–1650). In *Principles of Philosophy*, Descartes asserts that the primary property of all physical things is extension (AT 8a). That is, they take up space in the physical world and the

space they occupy is measurable. Thoughts, on the other hand, do not take up any space at all; they are without spatial extension and are, therefore, non-physical (AT 8a).

The distinction between two types of substances, one physical and one mental, imposes a separation between personal experience from the physical environment and leads to the substance dualism that Descartes is so often associated with (however, it should be noted that Descartes also categorised God as a third substance). According to Descartes, a substance is 'a thing that exists without depending for its existence on any other thing' (AT 8a: 24). He identified himself primarily with what he categorised as the thinking substance. In his *Discourse on Method*, he argued that it was possible for him to doubt the existence of matter but not the existence of his thinking (AT 6: 32). From this, he deduced:

> … I knew I was a substance, the whole essence or nature of which is to think, and that for its existence there is *no need of any place,* nor does it depend on any material thing; so that this 'me,' that is to say, the soul, by which I am what I am, is entirely distinct from the body, and is even more easy to know than the latter; even if body were not, the soul would not cease to be what it is. (AT 6: 33, my emphasis)

This distinction is considered again in 'Meditation VI' of Descartes' *Meditations on First Philosophy*:

> … on the one hand I have a clear and distinct idea of myself, insofar as I am simply a *thinking, non-extended thing*; and on the other hand I have a distinct idea of body, insofar as this is simply an *extended, non-thinking thing*. And accordingly it is certain that I am really distinct from my body, and can exist without it. (AT 7: 78, my emphasis)

Despite his claim that thought is a 'non-extended thing', Descartes linked movement, specifically movement within the brain, to mental experience. He proposed that impressions are left in the brain from the movement of the nerves and that, in effect, this 'movement causes the mind to experience' particular sensations in the body (AT 7: 87). But he also observed that this movement is experienced as a sensation (such as a pain in the foot) and not as an awareness of the actual motion occurring in the brain or along the nerves

(AT 7: 87). In this way, physical processes clearly differ from mental experiences.

While Descartes claimed that the mind did not extend in space, he proposed that minds did have a spatial location; he proposed that some form of mental awareness was linked to the brain. But, as we can see from the quotes above (AT 6: 33; AT 7: 78), Descartes did not believe that the brain was a thinking thing inside us; neither did he propose that the self was the brain alone. Instead, he proposed that mental substance passed into our experience via a point in the brain. This, Descartes predicted, was likely to be the pineal gland, 'the place in which all our thoughts are formed' (AT 3: 19). While today's neuroscientists have moved away from Descartes hypothesis about the function of the pineal gland, the Cartesian model of mind, according to (Rowlands (2010), still resides within the view that mental processes occur exclusively within the brain and that as a result of this our perception of the world is fundamentally separate or external to the subject.

Despite the numerous positions that have emerged within this paradigm, the Cartesian doctrine has cast a long shadow over philosophy of mind and cognitive science. Descartes' philosophy is usually presented as being the chief catalyst and stumbling block for the so-called mind–body problem (Blackburn, 1999). His belief in an immaterial substance is regarded as particularly problematic for the physical sciences, to the extent that his doctrines are often employed 'as stalking horses or straw men for the opponents of substance dualism' (Hatfield, 2003: 323). During his lifetime, however, he was faced with an entirely different problem. Descartes' ideas, and the newly emerging scientific tradition, were perceived as a threat to the power of the Church in Europe (Clarke, 2012). At that time, any challenge to the religious ideology in Europe was met with grave consequences. His distinction between two kinds of reality – the mental and the physical, *res cogitans* (a thing that thinks) and *res extensa* (a thing extended in space) – aimed to provide groundwork for the scientific tradition while respecting the territory of the internal plane upon which the Church held ultimate authority (Clarke, 2012). However, in the 21st century, not only are the physical sciences the dominant social and cultural force, but they have also ventured, through psychology and neuroscience, deep within an internal territory that, for centuries, had been perceived as scientifically ungrounded.

Thus, some neuroscientists find themselves confronted with the dilemma of consciousness being fundamental to the epistemology of their subject without having a theory of consciousness that they can agree upon (Harman, 1993).

1.1.2 Objections to the Cartesian Theory of Extension

In *Does Consciousness Exist?* (1904), William James presents a convincing argument against the Cartesian theory of extension. In it, he claims that, just as physical objects extend in space, for any adequate mental picture of an object to form an extension is also required along the mental plane. Or, to put this another way, ideas are recognised in virtue of mental extension, not in their absence. James proposes that the world is presented to us and known according to differing sets of relations that arise from either subjective or objective contexts. As far as he was concerned, the difference between physical and non-physical realities was the context in which they are viewed, not the absence or presence of extension.

James argues that, while the ordering and relative stability of mental pictures in comparison to physical objects is clearly looser, experiences that condense along the mental plane carry an energetic force and their effects intermingle with those that occur along the physical plane. James (1904: 489) creates the picture of this intermingling as a 'precipitation' between the 'fanciful and true'. In essence he positions our perceptual experiences as central to our experience of reality and that around this perceptual core additional conceptual relations occur. Away from this core, a world of ever more loosely connected relations may exists; however, according to James, these can be seen as no less real as 'clouds of smoke around a fire'. The difference, he says, is that among these mental clouds 'all sorts of rules are violated which in the core are kept. *Extensions there can be indefinitely located*; motion there obeys [none of] Newton's laws' (*ibid*, my emphasis). So, despite the looseness of these connection, James maintains their existence and hence that a distinct separation between the physical and non-physical realities is untenable.

However, despite James's attempts to diffuse the issue, evidence of Cartesian dualism persistently colours people's understanding of mental processes. Further attempts to shave any trace of respectability from the Cartesian posi-

tion have led to numerous characterisations of the mind–body problem, the most famous perhaps being Gilbert Ryle's 'ghost in the machine'. In *The Concept of Mind*, Ryle (1976), a behaviourist, attempted to dispel any allusions to the idea that some kind of non-physical entity could be associated with the mind, or be responsible for our actions. Such ideas pre-date Descartes, notions of the mind piloting the body have endured since the chariot allegories found in the *Katha Upanishad* and Plato's *Phaedrus*.

The critical position put forward by Ryle was that the mechanical theories emerging from the new scientific discoveries of the time and appropriated by Descartes had been inappropriately matched to theories of how mind affects matter. Ryle (1976: 20) proposed that the 'mental could not be just a variety of the mechanical'. So, for Ryle, not only is the idea of two separate substances, one physical and one mental, a 'category-mistake', but the issue of both being represented within the same framework of categories, such as 'things', 'stuff', 'state', 'process', 'cause' and 'effect'. The representation of minds within such a framework erroneously led to the impression of minds as 'extra centres of causal processes' (1976: 39). Ryle proposed that the phrase 'in the mind' should be abandoned completely, because it develops the view, in those that use it, that minds are 'places', the occupants of which are 'special-status phantasms' (1976: 40). With *The Concept of Mind*, Ryle aimed to show that the qualities associated with mind and mental experience do not necessarily take place 'in the head', in the colloquial sense, and 'those that do have no special priority over those that do not' (*ibid*).

The psychiatrist Stanislav Grof considers the mechanistic model of mind derived from Cartesian philosophy as one of the key conceptual challenges for consciousness research. In *Beyond the Brain* (1985), Grof highlights a wide range of phenomena that 'lie beyond the biographical realm of the unconscious' and that are 'unaccounted for by contemporary psychiatric theory' (1985: 25). Grof argues that the dominance of the mechanistic model within scientific enquiry means that, even within consciousness research, observations and data that are in conflict with this paradigm tend to be 'discarded or supressed' (1985: 17). As a result, research projects unrelated to the dominant mechanistic paradigm are unable to receive funding (*ibid*). This is an issue particularly relevant to the transpersonal research conducted by Grof, but it is also

one that, as Grof himself observes, extends beyond psychiatry. According to Grof (1985: 23), the dominance of the Cartesian paradigm means that 'mechanistic science tries to explain even such phenomena as human intelligence, art, religion, ethics and science itself as products of material processes in the brain'.

1.1.3 Cartesian and Non-Cartesian Cognitive Science

Most scientists who claim to be studying the mind today are unlikely to voice support for a Cartesian theory that conceives of the mind as a separate, non-physical entity (Cottingham, 1987). A non-physical conception of mind means that it is difficult to generate a convincing explanation for how unextended mental processes come to interact with the physical world and to locate where this interaction takes place. However, the Cartesian theory of mind continues to exert a strong influence upon cognitive science, so much so that Mark Rowlands (2010) claims that 'traditional' cognitive science could be considered 'Cartesian cognitive science'. He points out that the early work of cognitive science was guided by the analogy comparing the mind to a computer. In this analogy, mental processes were regarded as 'abstract "programs" realized in the "hardware" of the brain' (2010: 2). Consequently, cognitive theories that are supported by an analogy of mind as software and brain as hardware have not escaped the dualistic paradox, which many find so problematic with the Cartesian theory of mind.

According to Rowlands, it is the unquestioned assumption that cognitive processes occur exclusively inside the brain that makes 'Cartesian cognitive science Cartesian' (2010: 3). He summarises the conception of mind characterised by Cartesian dualism according to these two tenets:

1. Mind is a non-physical substance;
2. Mind is located inside the brain.

Rowlands argues that an authentic 'non-Cartesian theory of mind' should reject both of these tenets. Despite explanations of mental processes from both internalist and externalist camps that firmly renounce any notion that the mind is a non-physical substance, the internalist view – holding that

mental processes are identical to and formed exclusively by the brain – persists. This is an idea that, Rowlands argues, has been inherited from Descartes. 'The idea that the mind is something that exists inside the head' is a belief that, according to Rowlands, has been 'fashioned partly' but 'decisively in the image of the Cartesian view of the mind' (2010: 12). Internalism of this sort has also been cynically termed Cartesian materialism, referring to 'the view that the mind can be identified with the brain, and that the brain is a self-contained organ that can be understood in isolation from the world' (Zahavi, 2008: 370).

Rowlands rejects the view that mental states are located in the brain alone and proposes a theory of mind that accommodates mental events in locations that extend beyond the brain. He argues that the internalist assumption that all mental events are constituted solely by brain activity is actually working in the shadow of Cartesian dualism. 'Mental states and processes', Rowlands (2010: 13) proposes, 'are not just things that happen inside our brains; they are also things that happen, *partly*, in our bodies and even, *partly*, in the world outside our bodies'. However, many neuroscientists who are working to find a purely physical explanation for each and every mental event are still firmly committed to the assumptions of the mind/brain identity theory.

1.2 Internalist Views

1.2.1 Mind/Brain Identity Theory

The theory that each and every mental state and process is identical to a state and process in the brain is known as the mind/brain identity theory. According to Karl Popper (1995), identity theory is currently the most influential of the theories developed in response to the mind–body problem. Although the theory is often attributed to the pioneering papers *Is Consciousness a Brain Process?* (Place, 1956) and *The 'Mental' and the 'Physical'* (Feigl, 1958), it can be seen to have its roots in Spinoza's double aspect theory (Popper, 1995). Unlike Descartes, Baruch Spinoza (1632–1677) viewed the mental and physical as two aspects of one substance. The double aspect theory claims that the mental and physical are effectively two ways of seeing the same thing; the qualitative differences between these two aspects became known as property dualism (as opposed to Descartes' substance dualism). Spinoza proposed that every event had both an

inner/conscious aspect experienced by the subject and an outer/physical aspect measurable by science. However, he attributed these two aspects to one substance, namely God, while most mind/brain identity theorists (who often describe themselves as 'materialists/physicalists') do not.

Smart (2007), who collaborated with Place while he was writing *Is Consciousness a Brain Process?* (1956), notes that Place preferred to express the theory with the notion of *constitution* rather than *identity*. For instance, according to Place, lightning is constituted by electrical charges and the same can be said about our mental processes and the brain. Hence, according to identity theory, 'mental processes simply *are* brain processes; or more precisely, special kinds of brain processes' (Popper, 1995: 54). Directly rebuking Gilbert Ryle's point that dismissed a location for the concept of consciousness could be found Place (1954: 255) proposed that the 'logical objections which might be raised to the statement "consciousness is a process in the brain" are no greater than the logical objections which might be arise from the statement "lightning is a motion of electric charges". However objections are still to be found over the semantics of this statement – there are no subject descriptions of what it is like to be a lightning bolt. Likewise from a human position the 'sensation' of brushing my teeth, for instance, would not be understood in the same way as the 'brain process' that provides this capability.

After Place, we find Feigl (1958) addressing this issue by making the distinction between meaning and reference. According to Feigl, 'sensation' and 'brain process' may differ in meaning but they both coincide on the same point of reference. Since the work of Donald Davidson (1970), it has become popular to state that the psychological processes of a person supervene on that person's internal physical processes:

> Supervenience might be taken to mean that there cannot be two events alike in all physical respects but differing in some mental respect, or that an object cannot alter in some mental respect without altering in some physical respect. (Davidson, 1970: 214)

The 'materialists/physicalists' would, therefore, claim that the psychological can be fully accounted for in physical terms. As such, an exact similarity in physical respects will ensure an exact similarity in psychological respects;

hence, an exact physical duplicate would have the same functional role psychologically (Braddon-Mitchell & Jackson, 1996). This led to a type of functionalism, derived from mind/brain identity theory, which proposes that anything that is functionally like us is psychologically like us. From the mid-1960s, this type of functionalism came to be seen as an improvement on mind/brain identity theory but also inconsistent with it (Smart, 2007). This was because of the assertion that the function of a psychological state can be realised by not just one specific type of brain state but by a variety of different brain states. In other words, one person's feeling of a toothache might not be realised by the same neural process as those that realise another person's experience of toothache.

Functionalism was also central to the debate with regards to the development of artificial intelligence. A key figure in the philosophical foundations of this debate was Hilary Putnam (1975: 293), who proposed that 'whatever the program of the brain may be, it must be physically possible, though not necessarily feasible, to produce something with the same program but quite a different physical and chemical constitution'. The proposal that functional states might be realised using computer technology as well as in brains contributes to a wealth of conflicting opinions regarding the feasibility of artificial intelligence (McCulloch, 1965; Newell & Simon, 1976; Dreyfus, 1979; Searle, 1980; Dennett, 1991; Clark, 1997; Pepperrell, 2003).

Despite these issues, mind/brain identity theory is still considered to be a very plausible empirical hypothesis. For instance, Fodor (1987: 44) has stated that 'mind/brain supervenience [identity theory] is our only plausible account of how mental states could have the causal powers that they do have.' Most accounts that take mental activity to be attributable to the behaviour of the brain take the neuron to be the fundamental unit of brain activity. But the details of exactly which neural activities account for our mental experiences are, as of yet, incomplete. Some externalist philosophers (Dretske, 1995; Rowlands, 1992; Noë & Thompson, 2002) would say that studying neural structures and processes alone will never provide a complete account of our mental experience. But, despite the scepticism of these philosophers, the grand project that now occupies much of neuroscience is discerning which neurons and what sequences and rates of neuron firing lead to the full spectrum of sensory experience that most people encounter in their daily lives (Searle, 1980).

1.2.2 Marr's Computational Theory of Vision

The neuroscientist David Marr (1945–1980) is famous for pioneering an influential approach to visual processing and neural activity. His work has been taken by some to provide credibility to a computational theory of mind (Horst, 2009). According to this theory, cognitive states can be constituted by the transformation and storage of information-bearing structures (or representations) located in the mind/brain (Pitt, 2012). So, as with identity theory, the computational theory of mind assumes that all mental processes are located in the brain.

The main obstacle Marr faced when he began his research was the problem of trying to discern which elements of the information 'streaming' through each of the 140 million neurons in the average human cortex were visual, as well as what aspects of the world that they were describing. He observed that 'trying to understand vision by studying only neurons is like trying to understand bird flight by studying only feathers: it just cannot be done' (Marr, 1982: 27). To overcome this, researchers required an appropriate set of theories and technologies to reveal how each cell was functioning. Marr developed an outline formulation so that researchers could follow the behaviour of individual cells and their organisation into larger assemblies of cells, and so demonstrated how, through a process of neural activity, we are able to see.

Marr's highly influential theory of vision presented a model for how a visual stimulus from the world results in a mental representation forming in our brain. He assumed that sensations stimulating the retina must be processed and, in some way, interpreted so that an internal representation can be formed inside the brain (Noë, 2009). This internal representation may then inform an individual's decision-making process. Thus, seeing and what it feels like to see can be attributed entirely to neural processes. In order to explain the transformation of optical sensations into mental perception, or the formation of internal representations at a neural level, Marr's theory sets out to uncover the answers to these three core questions:

1. What function is each cell computing, and what is the goal of the computation? (Computational level)
2. What rules are being used to carry out these functions? (Representational/Algorithmic level)

3. How can these representations and algorithms be realised physically within the system? (Hardware/Implementational level)

(Marr, 1982)

This particular way of investigating vision, of isolating perception into a set of discrete steps, became something of an orthodoxy in cognitive science in the 1980s (Horst, 2009). Following this approach, neurons are categorised with increasingly specialised tasks that involve the manipulation and transformation of internal information-bearing structures. Marr was faced with the task of devising algorithms that modelled these tasks. However, there is confusion as to whether the visual system is actually *applying algorithms* or whether the behaviour of the visual system is just being *described algorithmically* (Horst, 2009, my emphasis). Furthermore, the specific way that algorithms are forced to represent a situation does not cover all aspects of the phenomena relevant to the experience. For some, Marr's questions reflect explanatory challenges more closely related to understanding information-processing mechanisms than our experience of vision (Noë & Thompson, 2002).

Vision, understood as an information-processing procedure that could just as easily take place in a computer as in a human being, could be termed computational functionalism. In what might appear to be a move back towards Descartes' philosophy, John Searle has stated that 'if brains act like computers and computers don't think, this might be reason to suggest that brains don't think either' (cited in Noë, 2009: 164). This is indeed counter-intuitive, because most people feel strongly as if they are thinking; however, this is likely to be Searle's point. To ignore the spectrum of subjective qualities that most people would associate with their visual experience and thinking process and still claim to be studying the mind is, for some, entirely unacceptable.

1.2.3 Neural Correlates of Consciousness

> You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and their associated molecules. (Crick, 1994: 3)

This famous quote, from Francis Crick's *Astonishing Hypothesis* (1994), has set the tone for much of the recent materialist/physicalist investigation into the mind

and the quest to find the neural correlates of consciousness (NCC). In the 1990s, during the so-called 'Decade of the Brain', billions of dollars in public funding and incredible advances in neuroimaging enabled scientists to test hypotheses that, in the past, would have been beyond their experimental means. Throughout this time, Crick attempted to find answers to questions such as: 'What is the "neural correlate" of visual awareness?' and 'Where are these "awareness neurons", are they in a few places or all over the brain and do they behave in any special way?' (Crick, 1994: 204).

These ambitious enquiries have, according to some, already yielded results. For instance, Paul Churchland, in the introduction to *The Engine of Reason, the Seat of the Soul* (1995: 3), states that 'we are now in a position to explain how our vivid sensory experience arises in the sensory cortex of our brains'. He claims that neuroscience can now provide us with an understanding of 'how the brain develops and deploys a framework of concepts that almost instantaneously recognises similarities, grasps analogies and is able to anticipate both the immediate and distant future' (Churchland, 1995: 4–7). However, explaining some of the mechanisms of sensory experience does not necessarily explain the subjective aspect of this experience (Chalmers, 1995), or how the brain manages to be the focus of conscious experience (Fodor, 2000). Hence, locating the qualitative aspect of the experience remains very problematic. This is partly because the physical properties of mental events do not explain our phenomenal experiences; this is what David Chalmers has famously christened the 'hard problem of consciousness'. As such, Chalmers (1995: 201) maintains that the subjective aspect of mental experience (i.e. 'why there is something it is like to entertain a mental image, or to experience an emotion') resists explanation 'in terms of computational or neural mechanisms'.

Rather than tackle the hard problem of consciousness head on, the approach of Crick and the many others who have been investigating the NCC is to limit their view to aspects of consciousness (such as pain, visual awareness, self-consciousness, etc.) that can be proven to 'employ a basic common mechanism' (Crick & Koch, 1998: 97). The reasons, stated by Crick and Koch, for focusing on visual consciousness over other forms of consciousness are because 'visual percepts are especially vivid and rich in information' and in 'addition, the visual input is often highly structured yet easy to control' (*ibid*). This control

is important in order to successfully test for the difference in brain activity in a subject when they are conscious of visual imagery compared to when they are not. Thus, for some, the experimental aim of the search for the NCC is to reveal 'the minimal set of neuronal events and mechanisms jointly sufficient for a specific conscious percept' (Koch, 2004: 16).

Crick and Koch (1995: 98) argue that, to be aware of an object or event, the brain has to construct 'a multilevel, explicit, symbolic interpretation of part of the visual scene'. Although they have had difficulty arguing the details of these points, the notion that the brain functions to produce 'internal representations' of the external world is widely accepted (Churchland, 1995). Our visual experiences of various colours, shapes and spatial relations are all constituted through various representations. Whether, our visual experience is 'true' to the scene in front of us or not and misperceived or illusory, the experience is deemed to have representational content. Hence, it has been argued that experiences in all sensory modalities, and even non-sensory experiences, have detailed representational content (Chalmers, 1998).

For those working to find the NCC, there is a major dispute over how our awareness of an internal representation is likely to be distributed: where in the brain might an internal representation be found? Is visual consciousness distributed over more than one area of the cerebral cortex or 'possibly over certain subcortical structures as well'? (Crick & Koch, 1998: 98) Roughly speaking we find two competing hypotheses for the examination of this issue: firstly, the global hypothesis, which proposes that, at one time or another, any neuron in this cortex or its associated structures could be responsible for an awareness of each internal visual representation; and, secondly, a simpler hypothesis, which proposes that only particular types of neurons express this awareness (Crick & Koch, 1998).

Whether one accepts that 'internal representation' and visual recognition function in an increasingly sparse area of the brain, or are globally distributed, the key assumption of all internalist accounts of perception is that we encounter reality indirectly. For example, according to Dennett's 'Multiple Drafts' model of consciousness, 'we don't directly experience what happens on our retinas, in our ears, on the surface of our skin. What we actually experience is a product of many processes of interpretation – *editorial processes*, in effect'

(Dennett, 1991: 111, my emphasis). Indeed, research shows that not all the activity in the brain reaches our awareness (O'Regan *et al.*, 1999; Simons *et al.*, 1999). Some neuroscientists, such as Chris Frith, would go even further. Frith (2007: 23) characterises his brain as 'not telling him everything it knows', and accuses it of 'deceiving him'. But these characterisations have also been criticised as misleading. Theoretical biologist Rupert Sheldrake (2012) observes that intellectual arguments like Frith's, which personify mechanisms in the brain, 'depend on a lingering dualism' (2012: 36) that has 'degenerated into misleading metaphors and rhetoric. (2012: 48) Clearly, the difficulty arises from the prevailing scientific approach that seeks a strictly objective view of subjective phenomena.

As the words suggest, a neural correlation of consciousness merely correlates neural activity to conscious experience; this is not the same as explaining the cause of conscious experience (Chalmers, 1998). The project to map the NCC might explain a great deal about how the brain functions but not what causes subjectivity. This leaves what is for some an unsatisfactory explanation, in purely physical terms, of where or when subjective experience occurs. For instance, there is still doubt about how useful 'lower-level' descriptions of neural firing are in relation to our familiar 'higher-level' descriptions of qualitative experience. Noë and Thompson (2004) argue that, in some cases, there is not even reason to think that the correlations between neural states and visual experiences match the conscious content of those experiences. Exemplifying the externalist position, Noë and Thompson warn against isolating sight from the enactive and attentional character of perceptual experience. They argue that visual perceptual consciousness can only be reduced to 'minimal neural substrates' by ignoring the phenomenal unity of the brain-body-world experience (Noë & Thompson, 2004: 26). Thus, a fuller understanding of the mind might be found beyond purely 'internal' neural correlates of consciousness, using examination of 'external' correlates as well (Noë, 2009).

1.3 Externalist Views

1.3.1 The Unity of Mind and World as Constituted by External Relations

As a vocal critic of the internalist position, William James foresaw issues with reducing consciousness to brain activity alone. James believed there were problems implicit in accepting 'unquestioningly' the brain-centred conception of the mind. He noted that to assume that such a doctrine had been established absolutely or was beyond doubt would lead to the denial of an 'independent mental existence' (James, 1897). The brain-centred doctrine avoids insight into familiar experiences such as boredom or ludic meandering, and yet such experiences can distinguish a great leap of cognitive insight from a waste of time. For James, to assume that thought is simply a function of the brain relegates 'consciousness to its interior' (*ibid.*). Opposing the internalist view that the brain is the sole producer of thought, he proposed that consciousness in fact 'connotes a kind of external relation' (James, 1904: 486). Instead of seeing the brain as an isolated producer of thought, or as being responsible for producing mental representations of the world, James characterised the mind as transmissive (James, 1897). He proposed that consciousness acts as a 'selecting agency' according to which our brains might be conceived of as organs capable of separating vaster units into parts and giving them a finite form. In this case, the study of the mind requires an understanding of the various relations formed around and within the brain. Therefore, according to James it is the brain, plus any given set of external contextual relations, that constitutes the mind as a whole.

Another key figure in the tradition of American pragmatism, John Dewey, also highlighted the issues with referring exclusively to the brain in order to understand perception. The outcome of any approach that investigates mental processes outside of their relational context would, according to Dewey (1896), result in such processes being presented as a 'series of jerks'. Dewey criticised as false the then-prevailing 'reflex-arc model of perception', which assumed that reflexes ascend from the body to enter the mind and then return as actions performed by the body. According to Susan Hurley (1998), this tendency to view perception as input from world to mind and action as output from mind to world still continues. Both argue that it is wrong to view perception

and action as separate systems. As such, it is this input–output conception of mind, leading to the impression that mind is a separate place from world, that externalism contends. Hurley (1998: 214) suggests that change in our conception of this process is required to take us from 'the input–output model of perception' to 'a two-level interdependence picture' (of 'dynamic feedback loops').

In a similar vein to James and Dewey, one of the founding fathers of the phenomenological tradition, Edmund Husserl, fiercely opposed a representational theory of mind (although he in no way denied the issues involved in understanding how an object appears to the consciousness of an individual). According to Husserl, most people are naturally inclined to think that the things they perceive are not inside their consciousness. Hence, if objects are outside of an individual's consciousness, what is within the individual's consciousness is their perception of the object. *Ergo,* this perception enters into an individual's consciousness through some kind of representational mediation, and it is therefore a representation of the object that is within the individual's consciousness. According to Husserl, the 'natural' assumption is that an internal representation of an object facilitates our awareness of that object. However, it is precisely this view that Husserl found so deeply problematic (Zahavi, 2008): for once the internal representation has formed, where is it known how the inner representation corresponds to an external object? And, more importantly for Husserl, where is the empirical evidence to show how any such internal representation comes to be known? He protested:

> The ego is not a tiny man in a box that looks at the pictures and then occasionally leaves his box in order to compare the external objects with the internal ones etc. For such a picture observing ego, the picture would itself be something external; it would require its own matching internal picture, and so on ad infinitum. (Husserl, 2003: 106)

Such an image of a homunculus is often employed in criticism of a representational theory of mind (Zahavi, 2008). But Husserl's argument was also supported by his analysis of how the various types of images that enter our awareness are experienced. For instance, contrary to everyday objects, pictures (or signs) are consciously apprehended as representations, or as objects that bear a resemblance to something else. Crucially it is the characteristic of re-

semblance to something else through which we comprehend pictures and signs as representational. Counter to this, Husserl did not believe that, in our everyday perception of non-representational objects, we questioned the likeness between the supposed internal representations of an object and the actual object. Thus, he found the very notion of internal representations to be problematic. Instead, for an object to appear in the consciousness of an individual rather than be given through the perception of a representation, we are 'given' our perception of objects through the objects themselves. In fact, this is the defining feature of perception for Husserl: 'that it presents us with the object itself in bodily presence' (Zahavi, 2008: 29). As such when one says that an object appears perceptually, we do not know what is perceptually 'given' through a representation as it is with a picture or sign that resembles something else (Husserl, 2003).

Husserl holds a particularly interesting position within the internalist–externalist debate. His methodology made famous a practice for overcoming a 'natural' attitude towards consciousness. Through the practice of phenomenological reduction, acts of consciousness and our consciousness of objects themselves – without the prejudices of common-sense realism – are 'offered' directly to our intuitions (Husserl, 1982, sec. 24). However, since his time, the method of phenomenological reduction has become characterised as a form of introspection (Dennett, 1987), interpreted as a description of subjective experience (Carman, 2006) and as a form of methodological solipsism (Dreyfus, 1991). Misrepresentation of his methodology – as leading us away from an apprehension of being in the world and towards an understanding of 'the transcendental life of consciousness' (Heidegger, 1927/1982: 21) – has, according to Zahavi (2008), resulted in Husserl often being characterised as in internalist.

One should emphasise, however, that there is no definitive consensus as to whether Husserl was of an internalist or externalist orientation. In fact, Zahavi (2008) argues that Husserl's rejection of representationalism – his rejection of the theory that internal representations mediate our awareness of the world – would make it difficult to categorise Husserl as an out-and-out internalist. Zahavi argues that, along with his 'anti-representationalist' view, Husserl also rejects metaphysical realism; referring to *Transzendentaler Idealismus: Texte aus dem Nachlass* (1908–1921), where Husserl (2003: 73) explicitly argued that objects,

objective being and consciousness belong *a priori* inseparably together; and where he also argued that what we think of as 'reality', the being of objects and all objectual states of affairs, only acquires meaning through reference to certain epistemic connections and certain conscious operations (Husserl, 2003: 28–29). So, far from leading towards an understanding of mind and world as distinct entities, the practice of phenomenological reduction was aimed at the realisation of the interdependence of mind and world.

Although a complete analysis of Husserl's thought in relation to the internalist–externalist debate is beyond the scope of this chapter, the argument developed by Zahavi (2008) suggests that, as far as the phenomenological project is concerned, the alternative labels of either internalist or externalist are not entirely appropriate. However, the outlook of phenomenological unity pioneered by Husserl, together with certain aspects of pragmatism, has often fallen under the umbrella term of externalism. Thus, the arguments of James, Dewey and Husserl's are often used to unsettle the claims made via a purely brain-centred investigation of mental processes. Particularly important is Dewey's (1896) criticism of the reflex arc paradigm and the thesis of indirect realism, a notion that he felt was guilty of an 'empiricist fallacy' that constructs a view from parts of something prior to observing the whole. There is also James's (1890) warning that the function of our mental processes will be misunderstood if the parts of the process are viewed in isolation from the context in which they occur. In other words, the overall effect of reducing our awareness of the world to internal representations that are produced exclusively in the brain stands the risk of omitting what many externalists would consider to be fundamental to the study of mental processes: consciousness itself.

In these counter-arguments, we find the impetus to consider the whole of mental life as the relationship between brain and world. The project to reduce the study of the mind exclusively to mechanisms occurring within the brain is critically summed up by Grof (1985: 25) when he states that: 'Materialistic science, blinded by its model of the world as a conglomerate of mechanically interacting separate units, has been unable to recognize the value and vital importance of cooperation, synergy and ecological concerns'.

1.3.2 Gibson's Ecological Account of Perception

Another key figure to challenge the indirect realism of the representationalist view was James J. Gibson. His ecological account of perception also views the perceiver and the environment as interdependent: 'the words animal and environment make an inseparable pair. Each term implies the other' (Gibson, 1979: 8). Ecological properties are relational in nature, contrary to the notion of internal representations, which are discrete entities, separate from the environment. The representationalist theory requires the perceiver to correlate intermediate entities formed in the brain to the external world, requiring a variety of higher-level cognitive mechanisms to take place before meaningful information can be recognised or utilised by the subject. In contrast to this, Gibson's ecological view of perception proposes that meaningful information is contained in the observer's environment and is perceived immediately and directly. Gibson's ecological account of perception proposes that the formation of internal mental representations does not necessarily order every perceptual experience. In other words, 'perception is direct inspection, not re-presentation' (Noë & Thompson, 2002: 4).

Gibson opposed the view that conscious experience is constructed from a number of serial processes, each constituted separately and each a passive sensory response to the world. Gibson saw perception and action in dynamic terms. In Gibson's account, we find that perception and action are 'tightly interlocked and mutually constraining' (Bruce & Green, 1990: 224); action is just as much a cause of perception as a result of perception. The key points of Gibson's account of perception can be summarised thus:

1. Perception is direct.
2. Perception and action are interdependent.
3. Perception of the environment affords opportunities for action.

In the final point, we find an indication of Gibson's famous notion of affordances. This concept is key to explaining how meaningful information is found in the environment and not just in the brain. Here, meaning is defined according to the relationship between the perceiver and the object of percep-

tion. What representationalists might consider as being top-down, higher-level meaning reserved for specific areas of the human brain shifts, in this context, to a level that is available between the environment and the perceiving animal. Finding affordance in a given context connects the perception of objects directly with their meaning, or what might be experienced as an intuitive awareness of each aspect of a particular process. We can understand the subject's cognition of the perceptual process as not being relegated to a decoding of neural activity (the neural correlates of consciousness), but instead as being conceived of as the detection of pertinent information relating to the perceiver's environment. According to Gibson:

> … an affordance cuts across the dichotomy of the subjective–objective and helps us understand its inadequacy. It is equally a fact of the environment and a fact of behaviour. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer. (Gibson, 1979: 129)

Gibson's concept of affordance is not without its critics, especially within traditional empirical science. Something that is 'both physical and psychical, yet neither' is a frank contradiction of the materialist/physicalist worldview. But it is an idea that fits with a key feature of James's radical empiricism, where relations between things are considered to be just as real as the things in the relationship. The collapse between the subject–object dichotomy can also be found in James's (1904) notion of 'pure experience'. According to James, the split between subjective or objective views only occurs in retrospect; they do not constitute the 'truth' of immediate experience. He observes that 'no dualism of being represented and representing resides in the experience per se. In its pure state, or when isolated, there is no self-splitting of it into consciousness and what the consciousness is of' (James, 1904: 485). In support of his claim, James quotes perceptual psychologist Hugo Münsterberg's *Grundzuge der Psychotechnik*: 'the perceptual object is not an idea within me, but that percept and thing, as indistinguishably one, are really experienced *there, outside*, you ought not to believe that the merely thought-of object is hid away inside of the thinking subject' (cited in James, 1904: 484). Gibson's investigation of direct perception is recognised as following in the Jamesian tradition (Heft, 2009) and is considered

to have transformed James's radical empiricism into a respectable 'realist approach' to perceptual psychology (Chemero, 2011).

There are further parallels between the thinking of James and Gibson that are particularly apparent in Gibson's notion of affordances. Where Gibson considers perception as a matter of selection (Gibson, 1966), James conceives of consciousness as a 'selecting agency' (James, 1890). With both men we find that there is an aspect of perception that is consecrated along a teleological trajectory. James (1890: 281) observes that perceptual activity 'comes with definite direction' and with varying degrees of 'desire and sense of goal'. The fundamental issue here is that agency structures experience, and specific goals or selective interests will permeate the experiences of an agent. 'Selection pressure' is created, according to Gibson, on the basis of whether a creature finds the 'availability (or non-availability) of affordances' (Reed, 1996: 18). In other words, the perceiving organism is compelled to make distinctions between relevant or irrelevant, essential or non-essential, and visible or invisible information in the course of its worldly interaction. Ultimately, this selection process imprints itself at a greater level upon the organism's evolutionary trajectory.

1.3.3 Extended Mind Thesis

The Extended Mind (Clark & Chalmers, 1998) not only addresses the unity between perception, action and cognition, but also the human capacity to apprehend and exploit the information-bearing structures found in the environment. For this reason, and because it is based on 'the active role that the environment plays in the cognitive processes' (Clark & Chalmers, 1998: 27), the authors also refer to this thesis as active externalism, distinguishing it from standard (semantic) externalism, in which external features of the environment act as passive drivers of the cognitive process (Putnam, 1975; Burge, 1979). As well as appealing to intuitions formed in childhood – whereby we feel our way into our environment and reach an understanding of our surroundings through play and exploration – the extended mind thesis also challenges the theories that claim mental processes are dependent on the brain alone for the transformation and storage of information.

The theory of the extended mind has become one of the key ideas within externalism; however, since Clark and Chalmers published *The Extended Mind* in 1998, there has been a move from what are now described as 'first wave' extended mind arguments towards 'second wave' extended mind arguments (Menary, 2010). First wave arguments emphasised the parity between cognition involving external processes and cognition involving internal processes in the brain. Clark gives examples, such as doing arithmetic using a calculator or using a calendar to plan and record events in one's life. In these examples, according to Clark, if 'a part of the world functions as a process which, *were it done in the head,* we would have no hesitation in accepting as part of the cognitive processes, then that part of the world is part of the cognitive process' (Clark & Chalmers, 1998: 29). Clearly, then, this version of the extended mind thesis is nested within functionalism. Clark's radical proposal asks us to recognise cognitive processes on the basis of what they do, not on the basis of where they are situated. Critics of the extended mind theory argue that the 'parity principle' leads to unsatisfactory cognitive explanations and suggest that external processes should not count as cognitive kinds (Fodor, 2009; Rupert, 2004). Unfortunately, the tactic adopted by these critics is to view the 'parity principle' separately from the other key principle in Clark and Chalmers' argument, namely 'causal coupling', which is the principle that certain types of cognition can occur through the coupling of internal and external processes.

The numerous exchanges between proponents of active externalism and its critics may explain the differences in the second wave of extended mind arguments. Second wave arguments take a less functionalist and more enactive approach to the extended mind (Menary, 2010), and tend to emphasise an 'integrationist perspective' (Rowlands, 2010: 88). Second wave arguments recognise that external processes are radically unlike the processes occurring in the brain, but they make a complementary contribution within the process of cognition. Certainly, in cases where external processes do things that internal processes do not, they act to extend the process of cognition from purely internal processes to ones that involve the environment as well. Thus from an integrationist perspective, 'the differences between internal and external processes are as important as, or even more important than their similarities.' (*ibid.*)

1.4 Summary

This study began with the premise that examining questions about the location of mind could feed into and enhance our understanding of the editing process and that an investigation of the editing process might also serve to inform arguments about mental location. While missing a focused discussion upon what constitutes the editing process or a topography of the various activities that define the editing process, this opening chapter has provided a clear outline of the two competing views towards the location of our mental processes: internalism and externalism. From here we find a conceptual framework from which to investigate mental location in the editing practice and the relationship between cognitive processes and cinematic technology.

A crucial question within the internalist–externalist debate is that of the methodological assumptions underlying each competing theory of mental location. In order to explain mental processes exclusively in terms neural activity, or to map the patterns of information processing in the brain to what a subject is conscious of, experience must be reduced to a series of computational operations. At present this approach to studying the mind can only be carried out in a laboratory setting. Some might argue that without being applied to the rich complexities of everyday activities and environments a level of abstraction is incurred, one that removes many of the characteristics that people would consider as being their experience of mind. But what are these? Studies have been made investigating the settings in which some complex mental processes take place. The evidence of these studies has been used to support the argument that there exist a unity between cognition and our sensory motor activities (Gibson, 1979; Clark, 1997; Noë, 2009). Therefore counter to the internalist argument, which claims that mental processes supervene exclusively upon neural processes, are a range of externalist arguments proposing that the activities of cognition are also located among extra-neural processes.

However one should stress that the extended mind thesis, outlined above as one of the main positions within externalism, does not propose that cognition occurs in the absence of neural activity. What the extended mind thesis points toward essentially is the role that extra-neural components play in the process of cognition (Clark, 2011). The extended mind thesis argues that, with-

out a correlation between these neural and extra-neural components, our thinking in the world is lacking crucial media by which information is processed. It proposes that some information-processing tasks are likely to be achieved more efficiently through our interaction with the environment than if they were carried out in the head alone. The externalist evidence suggests that we do not exist independently from the world: 'extension is not just a metaphor. It is not as if consciousness extends beyond the brain but does so for real' (Noë, 2009: 88).

How does the job of the editor sit in relation to the two models of mind outlined in this opening chapter? This question might be best answered by further investigation into the relationship between the editors and their working environment. However a wealth of research material already exists, which while not focused exclusively within the editing environment, happens to investigate similar aspects of the process and might therefore prove a useful grounding to this study. What comparisons, for example, have already been made between the metaphorical idea of extension and extension 'for real'? Or the role the body plays in how we come to know the world? And what further couplings, as conceived by Clark and Chalmers (1998), explain the activities existing between bodies and tools or mind and tools? It is now hoped that by looking at ways in which the relationship between mind and technology have already been studied, the next chapter will help to establish the basic ontological relationships that exists between tools and tool users and that this will act as critical context for an empirical study of editors and the editing process.

Chapter 2

Technology and the Extended Mind

2. Introduction

In the previous chapter in response to the question 'Where is the mind?' I presented two opposing views regarding the location of mind. A number of externalists have argued that mental processes are not confined to the boundaries of the skull; instead, the mind is 'extended'. The concept of extension has found a particularly rich application in discussions over the relationship between mind and technology. In their paper *The Extended Mind* (1998), Clark and Chalmers challenge the internalist assumptions that the processes of mind and technology are separate. The ideas proposed in their extended mind thesis, although not universally accepted, have now gained considerable recognition within the philosophy of mind (Menary, 2010; Rowlands, 2010). However a similar idea, one of technology being an 'extension of man', has been around for some time. In media studies, this idea is widely associated with Marshall McLuhan (1964), but it can be traced back even further to Aristotle in the fifth century BC (Lister *et al.*, 2003). The fact that philosophers have conceived of extension in a number of differing ways, ranging from its conception as a purely spatial, objective phenomenon (Descartes) to one that is relational and subjective (James), has had considerable bearing on what we understand as being mental activity and on the location of this activity.

Further investigation into how cognition and technology correlate can be examined from a variety of research perspectives. In this chapter, I intend to present three contexts from which the relationship between mind and media technology has been investigated:

A. The social context in which the invention and use of tools and signs mediates the development of the psyche (Vygotsky, 1930).
B. From the perspective of embodiment, describing how objects become apparent according to the technologies that make them available (Merleau-Ponty, 1945/2012; Ihde, 1990).

C. From a broader evolutionary perspective that recognises the role that technology plays in the developing patterns of behaviour in culture (Gibson, 1966; McLuhan, 1964; Clark, 2003).

These three areas appreciate the material processes that extend thought through the extension of things. However, the extension of our cognitive abilities, through tool use, heralds significant questions about how we define humanity. Some have argued that humanity's 'thinking tools' act as inseparable aspects of the species' relationship to the world, extending the externalist argument into debates over what it means to be human.

2.1 Thinking Tools and Humankind

According to Clark (1997: 194), in the process of finding efficient and systematic ways of fulfilling our goals (and exploiting information-bearing structures in the environment), mankind has developed tools and even designed environments that give us even greater abilities and allow us to achieve 'goals that would otherwise be beyond us':

> The way such tools work is by affording the kinds of inner reasoning and outer manipulation that fit our brains, bodies and evolutionary heritage. Our visual acuity and pattern-matching skills, for example, far outweigh our capacities to perform sequences of complex arithmetical operations. (Clark, 1999: 71)

The notion that external devices provide a faster and more reliable solution to certain cognitive tasks is not entirely new. Albert Einstein's once famously remarked that 'my pencil is cleverer than I'; in response to this, Karl Popper (1995: 208) explains that 'armed with a pencil, we can be more than twice as clever as we are without'. In addition to such rhetoric, significant research has been carried out into how we use technology to improve our cognitive abilities. For instance, studies have demonstrated how our sensitivity to variable relations in the visual field can be harnessed in order to fulfil a range of tasks; for example, the arrangement of objects as a form of aide-memoire (Vygotsky, 1930), the use of navigational instruments such as the sextant and the slide rule (Hutchins, 1995), and the method of rearranging letters to prompt word recall in games of scrabble (Krish, 1995). These examples demonstrate

dynamic loops between internal and external information-bearing structures and situate both as active components in the process of cognition (Rowlands, 2010). They suggest how technology has been developed in order to carry part of the cognitive load for the user (Clark, 1999). Rather than rely solely on detailed internal representations for every cognitive process, a more efficient approach to problem solving is 'off-loading' this information onto the environment. The intelligent approach distributes information-processing activities between the brain, the body, and the environment. Clark makes the case that our biological brains have evolved to take this into consideration.

The kinds of everyday tools that Clark cites in order to illustrate the extended mind range from simple paper and pen through to technologies such as the more advanced (but now equally pervasive) smartphone. Clark (2011) finds that particular instances of thought could only have occurred through the interaction between these internal and external information-bearing structures. In the introduction to *Supersizing the Mind* (2011), he refers to an exchange between physicist Richard Feynman and Charles Weirner. On the occasion when Weirner first encountered Feynman's original notes and sketches, the historian expressed his excitement at holding 'a record of [Feynman's] day-to-day work'. Feynman was quick to correct what he felt to be a misconception:

> "I actually did the work on the paper," he said.
> "Well," Weiner said, "the work was done in your head but the record of it is still here."
> "No, it's not a record, not really. It's working. You have to work on paper and this is the paper. Okay?"
>
> (from Gleick, 1993, cited in Clark, 2011: xxv)

What Feynman's retort suggests is that his intellectual activity and his notes and sketches were not separate processes; his thinking did not happen before it was recorded on paper. In this case, the medium is not a repository for digested thought, but a tool that facilitates thinking.

A crucial issue raised by Clark and Chalmers is the manner in and the extent to which humans exploit features of their environment in order to enhance their cognitive capacities. This, they propose, is a distinctive feature of the human mind and is integral to human intelligence (Clark & Chalmers,

1998; Clark, 2011). In this respect, we would not know ourselves, or the world as we do today, had it not been for our ability to mould aspects of our environment into epistemic technologies (Clark, 2011). Thus, technology might be considered an integral part of what constitutes humanity in the first place, as 'humans cannot be understood in isolation from the technological environment that sustains them' (Pepperell, 2003: 152). Or, as Gibson (1966: 27) succinctly stated, 'man is known by his artefacts'.

2.2 Technology and the Development of the Psyche

A considerable influence on contemporary research into distributed cognition is pioneering developmental psychologist, Lev Vygotsky (Daniels, 2008). One of the major themes of Vygotsky's work was an investigation into how tools and signs mediate sense and meaning, or what were at the time termed the higher psychological functions. In contrast to his predecessors, Vygotsky examined social contexts (including the psychology of art and learning) in order to develop his understanding of these activities. He worked during a period when psychology was torn between two competing schools, with behaviourism on the one hand and the introspective study of conscious human processes on the other. In Vygotsky's view, these established practices and theories could not explain the complex perceptual or problem-solving behaviour in humans. The fundamental cause of this failure was what he recognised as a split between natural science, which focused predominantly on sensory and reflex production, and mental science, which described the production of emergent higher psychological processes (Cole & Scribner, 1978). Vygotsky's stated aim was to overcome this division by analysing the social and historical situations where the use of tools and signs mediates psychological development.

Revealing the processes of mental development and location was a project that occupied nearly all of Vygotsky's professional life. In the latter half of his career, the focus of this project moved towards an attempt to understand, through the structures of our mental processes, the material substratum of complex forms of mental activity. Six weeks before his untimely death, he wrote:

> It seems to me that the problem of localization, like a common channel, includes the examination of both the development and the disintegration of higher mental functions. (Vygotsky in Luria, 1967/2002: 17)

In particular, higher mental functions were not, according to Vygotsky, features of the mind that emerged exclusively from within the individual, but are also constituted 'outside the individual human organism in objective social history.' (Luria, 1967/2002: 18)

2.2.1 No Mediation, No Meaning

The concept of mediation played a key role in Vygotsky's approach to the study of how tools and signs contribute to the development of human intelligence and problem-solving behaviour. He used the term 'mediating link' to describe the structure of behaviour and interaction between an individual and their environment (Daniels, 2008). Rather than reducing human problem-solving capacities to the unconditioned reflexes advanced by a stimulus–response theory of human behaviour, Vygotsky claimed that an individual modifies their situation through their activities, with a stimulus serving as a part of their response. In *Mind in Society* (1930), he gives the examples of drawing lots as a way of making decisions and of tying a knot in a string as a means of remembering something. Both activities modify the environment in order to establish a temporary connection to it. Rather than being an unconditioned reflex, Vygotsky considered this to be a form of conditioned reflex.

In *Mind in Society*, Vygotsky traced the concept of mediation to Hegel, who he quotes as saying:

> Reason is just as cunning as she is powerful. Her cunning consists principally in her mediating activity, which by causing objects to act and react on each other in accordance with their own nature, in this way, without any direct interference in the process, carries out reasons' intentions. (Hegel in Vygotsky, 1930: 54)

He thus characterises the material forces underlying human reason. He also found a similar rationale being presented by Marx in relation to mankind's approach towards tool use. Marx states that man 'uses the mechanical, physical, and chemical properties of objects so as to make them act as forces that af-

fect other objects in order to fulfill his personal goals' (cited in Vygotsky, 1930: 54). As he was a scientist working in post-revolutionary Russia, Vygotsky's theoretical framework was heavily influenced by dialectic materialism. However, while Engels recognised, through dialectic materialism, that human labour and tool use were means of transforming nature, Vygotsky emphasised tool use as a means of transforming human psychological functions. But in order to satisfy his scientific ambitions, Vygotsky needed to develop an experimental method for investigating the development of mankind's mediating activities.

What distinguished Vygotsky's experimental approach was a focus not upon whether a goal could be achieved, but on the methods by which the goal was achieved; not merely on whether a problem could be solved by a subject, but on how the problem was solved. He directed many of his observations towards children's problem-solving behaviour and, in the course of this, he noted that:

> A neutral object is placed near the child, and frequently we are able to observe how the neutral stimulus is drawn into the situation and takes on the function of a sign. Thus, the child actively incorporates these neutral objects into the task of problem solving. (Vygotsky, 1930: 74)

In experimental studies, Vygotsky examined alternative routes to problem solving using what he termed 'external aids'. He developed a 'method of double stimulation' (*ibid.*) that presented the subject with a problem, but also with a second stimulus, which was offered as a means to solve that problem. However, he did not always provide his subjects with a method for how to use these external aids. Thus:

> Instead of giving the child the prepared external means, we will wait while he spontaneously applies the auxiliary device and involves some auxiliary system of symbols in the operation… In not giving the child a ready symbol, we could trace the way all the essential mechanisms of the complex symbolic activity of the child develop during the spontaneous expanding of the devices he used. (Vygotsky, 1930: 60)

Vygotsky observed that, in young children, problem-solving abilities often relied upon external signs (such as fingers for counting) for their efficacy. But he also observed that this activity develops so that 'the entire process of

mediated activity (for example memorising) begins to take place as a purely internal process'. It was observed how older children relied less on external cues in some of their problem-solving activities. What began as a mediated activity in younger children appeared to be lost in older children, who had memorised these external signs internally and abandoned their reliance upon them. Vygotsky proposed that this was a result of internalisation.

2.2.2 Internalisation and Cognition

Vygotsky (1930: 56) defined the process of internalisation as the 'internal reconstruction of an external operation'. One important way in which Vygotsky illustrated an early example of internalisation was through the development of pointing in infants. During the initial stages of this activity, pointing starts as an unsuccessful attempt to grasp an object in the hope of some possible forthcoming activity. This unsuccessful action appears to the observer to be a gesture; the gesture is read as an attempt to point at the object. In the social context, the mother comes to the child's aid and hands the object to the child. The child's unsuccessful attempt to grasp the object engenders a reaction, not from the object but from another person, namely the mother. Vygotsky emphasised this as just one example of the social dynamic through which meaning forms and is internalised; eventually, a grasping movement changes to the act of pointing and the activity is internalised as a symbolic gesture.

Vygotsky (1930: 48) observed how this process of internalisation occurred through a series of transformations:

1. An operation that initially represents an external activity is reconstructed and begins to occur internally.
2. An interpersonal process is transformed into an intrapersonal one. Firstly between people and then inside of the developing psyche. On this basis, Vygotsky posits that all the higher functions originate as actual relations between human individuals.
3. The character of inner processes develops over a prolonged period while the related external activities may continue. The external activi-

ties turn inward and link according to the laws and changes governing that activity.

Vygotsky recognised the role that artificial stimuli, through the reconstructive process of internalisation, play in psychological development. He repeatedly emphasised their auxiliary role in permitting 'human beings to master their own behaviour at first by external means and later by more complex inner operations' (Vygotsky, 1930: 73). He claimed that internalisation of tools and signs was essential to the behavioural transformation and cognitive development of humans.

Through his research, Vygotsky was able to observe how the meaning of objects expanded internally so that the tools and signs between them extend our cognitive abilities. He maintained that there are essential similarities and differences between these two forms of mediating activity. As an auxiliary means of problem solving (remembering, comparison, selection, and so on), Vygotsky could see how the sign acts as a psychological counterpart to the physical processes of a tool. 'The sign', he wrote, 'acts as an instrument of psychological activity in a manner analogous to the role of a tool in labor' (Vygotsky, 1930: 43). The analogy between tools and signs rested, according to Vygotsky, on the mediating activity that characterises each of them. However, he also attempted to clarify the essential differences between them, primarily by characterising the different ways tools and signs orientate human behaviour. He proposed that the tool is externally orientated, involving an activity that is aimed at 'mastering, and triumphing over, nature'. The sign, on the other hand, is oriented towards a psychological operation, and is 'a means of internal activity aimed at mastering oneself; the sign is internally orientated' (Vygotsky, 1930: 46).

At the same time, Vygotsky (1930) also noted the psychological link between tools and signs, with both forms of mediated activity increasing the means through which cognitive solutions may be reached. He claimed that the use of tools refutes the notion that there can be a single organically predetermined system of human–environment interaction; similarly, the use of signs demonstrates that there is more than one organically predetermined system of activity that exists for each psychological function. Thus, the use of signs fun-

damentally changes all psychological operations, and the use of tools increases the range of activities within which psychological functions operate. The combined use of tools and signs contributes to what Vygotsky's assistant, Alexander Luria, termed the problem of functional localisation:

> The fact that in the course of history man has developed new functions, does not mean that each one relies on a new group of nerve cells and that new 'centres' of higher nervous functions appear like those so eagerly sought by neurologists during the last third of the nineteenth century. The development of new 'functional organs' occurs through the formation of new functional systems, which is a means for the unlimited development of cerebral activity. The human cerebral cortex, thanks to this principle, becomes an organ of civilization in which are hidden boundless possibilities, and does not require new morphological apparatuses every time history creates the need for a new function. (Luria, 1967/2002: 22)

Vygotsky and Luria both argue that the human mind is best understood as an emergent process, involving social and historical conditions as well as those of the individual. This approach to researching the human mind has continued within the field of distributed cognition. Researchers in this field argue that traditional cognitive psychology is limited by the basic assumption that cognition is best understood as a system occurring in the brain alone and that the basic unit is the activity of the neuron. Rather, the unit of analysis deployed in the field of distributed cognition is discussed in terms of a 'cognitive system' (Daniels, 2008).

However it is debatable how to best communicate the claims made by the distributed approach to cognition. Hutchins (1995), like Luria, uses the term 'functional system' with the intention of emphasising how tasks are shared between people and things. But this suggests, in an attempt to disassociate the study of mental processes from the limitations of traditional cognitive science, that the term 'cognitive system' could be more appropriate. Meanwhile, Clark (2011) – who recognises the human capacity for the literal incorporation of new equipment into systems of thinking and acting – conceives of 'whole new agent world circuits' or 'new systemic wholes' in order to describe the functional operations when tool and user come together.

2.3 Embodiment in Relation to Technology

A particularly interesting debate arises from analysing the relationships between the human body and the objects that are appropriated or manufactured to become tools for its use. The starting point of analysis is often to demonstrate how the world is negotiated through embodied agency (Merleau-Ponty, 1945/2012; Gallagher, 2005). With regards to tool use, knowledge of embodiment directs us towards what some view as the distinctions between body-extension and body-incorporation (de Prester *et al.*, 2009). For instance, if a stick is used as a tool for pointing towards an object, it can be seen as an extension of the finger, but a stick can also be incorporated within the body/mind schema of the user, as is famously illustrated by Merleau-Ponty (1945/2012) through the example of a blind man's use of his cane. Here, we find that, where bodily extension or bodily incorporation is concerned (even through the use of simple tools such as sticks), the negotiability of our own embodiment must also come into consideration (Merleau-Ponty, 1945/2012; Ihde, 1974, 2012; Clark, 2011).

It is also worth noting that embodiment is used to support a number of externalist arguments and to counteract the claims of internalism. From an embodied viewpoint, some have argued that mental processes should not be thought of as being fixed exclusively in the brain, but as being distributed between wider bodily structures and processes. A variety of research projects (Brooks, 1991; Lakoff & Johnson, 1999; Thompson & Varela, 2001) have focused on the roles that bodily operations and awareness play in the cognitive process. For instance, the evidence of embodied cognition leads to what Shapiro (2004) calls the embodied mind thesis, which argues that mental processes are shaped by the bodies in which they operate. Two interrelated externalist arguments will be discussed here, firstly by introducing the rationale behind embodied cognition and the embodied mind, which leads to further discussion and provides the context behind issues pertaining to embodiment in relation to technology. The point here is to show how the interactions between biology and technology act within the world to form what Clark (2011) terms 'extended systems'.

In *The Mind Incarnate* (2004), Shapiro argues against the notion that a human-like mind could exist in a non-human-like body, an idea that is often characterised by the image of a brain-in-a-vat (Dennett, 1981; Searle, 1983). Shapiro calls this the separability thesis. He characterises the separability thesis as the view that 'from knowledge of mental properties it is impossible to predict properties of the body' (Shapiro, 2004: 167). He argues that by studying bodies we gain a better understanding of the kinds of cognitive processes that the brain carries out. Thus, mental processes cannot be 'characterized in abstract from the body' in which they operate (Shapiro, 2004: 175). For example, human vision exhibits particular characteristics not only on the basis of processes occurring in the brain but also because of the quantity and arrangement of the organs of sight and spatial location. The perception of depth, for instance, is calculated from the disparity of information between two eyes; had we more or fewer eyes, or if our eyes were situated on the sides of our heads, then the neural process required for the perception of depth would change. Thus:

> Vision for human beings is a process that includes features of the human body… Perceptual processes include and depend on bodily structures. This means that a description of various perceptual capacities cannot maintain body neutrality and it also means that an organism with a non-human body will have non-human visual and auditory psychologies. (Shapiro, 2004: 190)

The argument that the mind cannot be understood without reference to specific bodily properties has been extended to include the human mind and body that incorporates non-human body parts into its activities. So, while Shapiro argues convincingly for the contribution that embodiment makes towards the cognitive process, others make further claims that the human mind is characterised by its ability to incorporate non-human body parts into its activities (Clark, 2011). This calls for consideration of the embodiment of technology and, thus, the contribution that technology, as an embodied phenomenon, makes towards cognition, particularly in cases where technology alters the physical boundaries of embodiment, or where it augments the perceptual capacities of its user. In this respect, Merleau-Ponty (1945/2012), Ihde (1991) and

Clark (2011) make important contributions to the externalist position through their detailed analyses of the embodied relations involved in tool use.

2.3.1 Bodily Extension and Bodily Incorporation

The distinction between bodily extension and bodily incorporation has an inevitable bearing on what may or may not be considered to be the wider bodily structures and processes involved in cognition and, therefore, the kinds of experiences where technology extends the mind. To illustrate this distinction, the use of a stick as a pointer could be said to count as an instance of body-extension, whereas the use of the stick as a prosthesis could be said to count as a case of body-incorporation (de Prester *et al.*, 2009). However, this distinction is unlikely to be fixed, as in many respects it depends on the cognitive state of the user. For instance, objects can be appropriated towards a variety of uses (Vygotsky, 1930) and a variety of tools can be appropriated towards the same prosthetic function (Ihde, 1991). What these investigations show is that any efforts to negotiate our relationship with the world involve knowledge of our body's boundaries; additionally, embodied cognition has revealed a subjective transparency in the relationship between internal bodily relations and objects located in the external world.

The subjective discernment between one's body and objects located outside of one's body, but within one's external environment, was investigated thoroughly by Merleau-Ponty in *The Phenomenology of Perception* (1945/2012). According to Merleau-Ponty, our appreciation of the spatial relations within the body tends to differ from the spatial relations we have towards the external world. Spatial relations between objects in the external world tend to be judged according to arrangements such as near or far, above or below, etc. Meanwhile, operational aspects of the subject's body, such as the organs of sight, are not judged according to these kinds of spatial relations, arriving in the moment of an experiential whole. Thus, there exists an experiential boundary between the body and objects located outside it in the external world. He states that 'The outline of my body is a frontier which ordinary spatial relations do not cross. This is because its parts are interrelated in a peculiar way: they are not spread out side by side but (are) enveloped in each other' (1945/2012: 98).

However, Merleau-Ponty also describes a number of cases where subjective distinctions between the body and objects located in the external environment are not so abrupt. In one such case, he famously uses the example of a blind man whose navigation of the world is aided through the use of a stick. In this instance, Merleau-Ponty (1945/2012: 143) proposes that, in the blind man's experience of the stick, the stick 'has ceased to be an object for him; its point has become an area of sensitivity extending the scope and active radius of touch, and providing a parallel to sight'.

Merleau-Ponty uses the case of the blind man and his stick to make a distinction between the 'objective body' and the 'live body'; between the body as a material, physiological entity and the organism that is experienced by the subject as a means of engaging with the world. Similarly Jean-Paul Satre, a contemporary of Merleau-Ponty, suggested that the 'lived system' is invisibly present. He argued that the body is existentially lived rather than known. He described his organs of actions as lost in the course of an activity. Whilst working, he stated 'My hand has vanished; it is lost in the complexe system of instrumentality in order that this system may exist' (Satre, 1956: 323). In the case of the blind man who has incorporated the stick into the experience of the live body, while he is exploring the world 'the length of the stick does not explicitly intervene nor act as a middle term: the blind man knows its length by the position of the objects rather than the position of objects through the cane's length.' (Merleau-Ponty, 1945/2012: 144)

Despite laying the foundation for views that make claims towards the embodied mind, the terms 'objective body' and the 'live body' have proved problematic within the context of cognitive science. Hence, Gallagher (2005) has reassessed these terms and replaced them with 'body image' and 'body schema'. He defines the body image as our 'perceptions, beliefs, or attitudes' towards our bodies, whereas the body schema is defined as 'preconscious, subpersonal processes' (2005: 26) that regulate posture and enable movement. Due to the body schema, any part of the subject's body is immediately available for use without the subject requiring any knowledge of their position. With these terms, it is possible to make a clear distinction between bodily extension and bodily incorporation. An object or tool that has been successfully incorporated into the subject's activities is indistinct, when in use, from the body schema.

Thus, the body schema is defined through 'the embodied capabilities for action that correlate with the affordances of the world' (Gallagher & Zahavi, 2012: 166).

Clark (2011) seems alert to the fact that there is nothing particularly new in humans discussing their tool use or noting the apparent transparency between tool and fluent user. He is, however, able to 'update' the relevance that these discussions of the embodied mind bring to the debate about mental location. For instance, Clark references recent studies on tactility and visuals, or the bimodal features of tool use. One example in particular, *When Far Becomes Near* (Berti & Frassinetti, 2000), examines a subject who, following a stroke, suffered from a non-recognition or dissociation between near and far space, a condition known as unilateral neglect. In tests, the use of a pointing stick was shown to extend the subject's body image and with it areas previously out of sight or neglected in the subject's field of vision. In conclusion to their experiments, Berti and Frassinetti state:

> The brain makes a distinction between "far space" (the space beyond reaching distance) and "near space" (the space within reaching distance) [and that]… simply holding a stick causes a remapping of far space to near space. In effect the brain at least for some purposes, treats the stick as though it were a part of the body. (cited in Clark, 2011: 38)

The research that Clark cites demonstrates cases where a tool user's 'plastic neural resources become recalibrated (in the context of goal-directed whole agent activity)'. (2011: 39) This statement is supported by neurophysiological and psychological research conducted by Maravita (2003, 2004) on tool use. Maravita's own conclusions seem entirely compatible with the philosophy of the embodied mind:

> extension of the visual RF [receptive fields] of multisensory neurons following tool-use seems to indicate that previous introspective, or purely speculative, claims that the "body schema" can extend along a wielded tool or along frequently used objects may in fact have some correspondence to neurobiological reality. […] Our results, therefore, suggest that with prolonged use, *the tool effectively becomes an extension of the hand that wields it*. (Maravita *et al.*, 2003: 536, my emphasis)

Shapiro's (2004: 190) claim that our 'perceptual processes include and depend on bodily structures' seem particularly pertinent here. The evidence cited by Clark (2011: 38) demonstrates that these structures can be extended by objects of a 'non-human' origin being incorporated into the body schema, while this has also demonstrated in the non-human use of tools (Maravita *et al.*, 2003). With these findings for how tools are being incorporated into the human body schema we are driven to accept perceiving and acting as mental processes. Propelling us toward the elusive and increasingly topical question concerning where 'the mind stops and the rest of the world begins' (Clark & Chalmers, 1998: 27).

To avoid the suggestion that there is an end-point or a set location in space where the meeting of mind and world occurs, phenomenologists have adopted use of the word 'terminus'. Terminus does not refer to a static theoretical location, but rather to the realising moment in life as it is lived in the world: 'an intentional correlation that is not static but dynamic and existentially ecstatic' (Sobchack, 1992: 176). The term, therefore, is used to evoke a sense of motion within consciousness in relation to *ek-stasis* (being outside of oneself); at least, this is the meaning that is being advanced by Heidegger (1927/1962), Merleau-Ponty (1945/2012) and Ihde (1990). For example, in his examination of our perceived relationship with objects in our environment, Merleau-Ponty (1945/2002: 373) does not locate the relationship internally, but as standing 'at the other end of our gaze or at the terminus of our sensory exploration'. Yet if, for instance, a cameraman incorporates a viewfinder into his body schema, the embodiment relation of human and machine could be described as 'transparent in that the mechanism is seen through: the world is the "terminus"… the machine is incorporated into the human intentional act of perceiving the world' (Sobchack, 1992: 176). The phenomenological analysis here, as with the case of the blind man's cane, describes the perceptual focal point being experienced between the user and the environment, rather than as a sequential set of events that separate the user, the tool, and the environment.

2.3.2 Instrument-Mediated Perception

The blind man's cane and the cameraman are just some of the cases of tool use illustrating an indeterminate boundary between the subject's body and their environment. There is a certain class of tools – including glasses, telescopes, probes and hearing aids – that in the process of mediating a subject's perception of an environment become incorporated into the body schema (Ihde, 1990). These tools are no longer considered to be objects in the subject's environment, but are tools through which the environment is experienced. They are cases of what Ihde (1990) calls 'instrument-mediated perception'.

Extending the distinction that Vygotsky (1930) makes between unconditioned and conditioned reflexes, Ihde (1990) examines our relationship to the pre-processed sensory information that instrument-mediated perception provides. In particular, he notes the revealing/concealing and magnification/reduction structure of embodied artefacts. In cases where scientific observation is embodied through the use of instruments, Ihde (2012: 67) argues that the research is subject to 'instrumental phenomenological variations'. The impact that this external information processing imposes on the flow of data, from which knowledge and theories are based, forms the impetus for a number of epistemological studies into the nature and reliability of scientific instrumentation (Hacking, 1983; Ihde, 1991; Brown, 1990).

Through a process of phenomenological reduction, Ihde (1990) attempts to give an account of 'recurrent patterns of experience' in the relationship between humans and technology. He terms one particular aspect of this embodiment 'relations' (others include 'hermeneutic relations', 'alterity relations' and 'background relations'). He explains the incorporation of a technology into a user's body schema as follows: 'I take the technologies into my experiencing in a particular way, by way of perceiving through such technologies and through the reflexive transformation of my perceptual and body sense' (Ihde, 1990: 72). He states that by 'extending bodily capacities technology also transforms them. In that sense, all technologies in use are non-neutral' (Ihde, 1990: 75).

However, while Ihde's investigations unpack the taken-for-granted perceptual transparencies that underlie embodiment relations and tool use, ac-

cording to Brey (2000), he overlooks the details of how embodiment relations are constituted. Merleau-Ponty (1945/2012) on the other hand, uncovers the constitution of embodiment relations by analysing the dynamic between perceptual skills and motor skills. Learning to and becoming expert in navigating everyday space using a stick, is one example cited by Merleau-Ponty. In other cases not only is the user's perception mediated through the tool but their motor skills can also be expressed with the instrument. The use of a stick – in the form of a paintbrush, which mediates reflexive motility and perception and their extension into expression – is examined by Merleau-Ponty in his essay *Cezanne's Doubt* (1945) and in *The World of Perception* (1948/2004).

This form of reflexive relationship occurs through various instruments and artists; it also finds expression, according to Merleau-Ponty, between an organ player, an organ, sheet music and the experience of organ music as it is lived:

> [The organist] sits on the bench, engages the pedals, and pulls out the stops, he sizes up the instrument with his body, he incorporates its directions and dimensions, and he settles into the organ as one settles into a house. He does not learn positions in objective space for each stop and each pedal, nor does he entrust such positions to "memory." During rehearsal – just as during the performance – the stops, the pedals, and the keyboard are only presented to him as powers of such and such an emotional or musical value, and their position as those places through which this value appears in the world.
>
> (1945/2012: 146–147)

In the case of the organ player, there is some ambiguity as to whether the player's perceptual skills are subordinate to their motor skills. Such is their expertise and the transparency of their relationship to their instrument that efforts to separate these skills appear to be divorced from the moment being expressed. Merleau-Ponty describes the aesthetic outcome, which emerges from a direct relationship between the body of the organist as 'the place of passage'; here, 'the music exists for itself and everything else exits through it' (1945/2012: 147). With a new instrument, Merleau-Ponty suggests, a new core of signification is brought forth. There appears to be no separation at this core between artist and technology; neither is subordinate to the other. And yet he also

recognises, despite the efforts of the practitioner, that artistic expression might be limited to particular motor habits: 'sometimes the signification aimed at cannot be reached by the natural means of the body'. In this case, we then 'construct an instrument, and the body projects a cultural world around itself.' (1945/2012: 148)

An abundance of new instruments for aesthetic expression have emerged since Merleau-Ponty wrote *The Phenomenology of Perception* (1945/2012), with a cultural shift of global proportions being driven by the move from analogue to digital formats. The significance of this shift has been expressed in the work of media artists, debated extensively, and subjected to thorough analysis (Mulvey, 2005; Rodowick, 2007). Even though phenomenological methods of enquiry have contributed significantly to the analysis of this shift, either in relation to the non-neutral effects of instrument-mediated perception (Ihde, 2012; Haraway, 1991), or the development of new sensory motor habits in relation to these new tools (Merleau-Ponty, 1945/2012), broader changes in cultural habits may also underlie the subject of these investigations. When viewed from the perspective of media ecology, as will be shown in the following section, many examples of technological innovation are seen to alter our relationship to the world so radically that, for some, they also account for changes in human behaviour.

2.4 Ecological and Evolutionary Perspective Towards Media Technology

The human response to and human behaviour within the world of media are topics central to the field of media ecology. Media ecology 'is broadly defined as the study of complex communication systems as environments' (Nystrom, 1973: 3). Both McLuhan and Gibson are recognised as seminal thinkers in this field. While McLuhan is often credited as the modern mind behind the idea of technology as an extension of the human mind, this notion is also recognised as running in parallel to and complementing Gibson's notion of affordance (MacDougall, 2013). Even though the two thinkers differed significantly in their approach to research, Gibson's understanding of the way technologies mediate experience and the way in which this changes human–environment interaction

had similar ontological foundations to McLuhan's. Both thinkers were highly critical of perpetuating a distinction between real and artificial, or biological and cultural, aspects of the environment (MacDougall, 2013). Ultimately, both thinkers argue for a collapse of the mind–body and self–other dualisms that conceive of these dichotomies.

2.4.1 Perception in the Cultural Environment

Although Gibson's ecological account of perception makes a bold contribution to the externalist view of how mind and world relate, his views towards our perception of art and media fluctuated. On the one hand, he presented a view that visual perception of the world is direct, needing neither mediation nor interpretation; on the other hand, he argued that human perception evolved thanks to an awareness that has been brought about by our engagement with words, images and instrumentation (Gibson, 1966).

According to Gibson the transmission of knowledge has evolved – along with mankind's experience of the environment – through incremental steps brought about through the development of speech and pictorial representation. In *The Senses Considered as Perceptual Systems* (1966: 236), he proposes that, until ancient humans learnt to draw and to 'perceive by means of drawings', they would not have paid attention to 'the perspective of things'. Gibson claims that it is only through image-making that 'man began to be self-conscious about perception.' (*ibid.*)

From Gibson's ecological perspective, it has been proposed that humans developed technology and pictorial perception to make information available beyond that which was previously or ordinarily available to us (Michaels & Carello, 1981). This capability provides humans with access to useful aspects of their environment (in the form of information) necessary for their survival and evolutionary success (Michaels & Carello, 1981). Our close relationship to this technology suggests that, without the affordance of extension, our approach to the world would be significantly altered. Thus, from an evolutionary and ecological perspective, our engagement with the mediated environment raises a number of interesting issues.

Gibson describes the process by which man is made aware of things outside his immediate environment as 'mediated perception'. This is in contrast to his accounts of our engagement with things that are within our immediate environment, which he described as 'directly perceivable'. It is interesting to note that Gibson considered the terms 'ecological' and 'directly perceivable' inter-definable. This has led some to posit that because non-ecological properties are perceived in the mediated environment, 'perceiving by the use of instruments does not count as a core case for Gibson' (Fodor & Pylshyn, 1981). On occasion Gibson (1966: 26) expressed scepticism over the 'non-ecological properties contained in narrative environments' and considered that the culture of cinema, for instance, leads to 'perception at second hand' (1979: 295). However, elsewhere he posits that 'tools for perceiving' were an effective analogue with 'tools for performing' actions in the world (1977: 290). Thus, given the inseparability Gibson finds between action and perception, organism and the environment, it becomes difficult to not consider 'tools for performing' and 'tools for perceiving' – and the information they reveal – as constituting valid ecological properties.

Notwithstanding Fodor and Pylshyn's (1981) allegations, Gibson's ideas have led to a wealth of research (Norman, 1998; Anderson, 1998; Burnett, 2004; Fuller, 2005), which emphasises the cultural context in which affordance takes place. In his overview of the cultural environment, Gibson states:

> Culture evolved out of natural opportunities. The cultural environment, however, is often divided into two parts, "material" culture and "non-material" culture. This is a seriously misleading distinction, for it seems to imply that language, tradition, art, music, law and religion are immaterial, insubstantial, or intangible whereas tools, shelters, clothing, vehicles, and books are not… But let us be clear about this… No symbol exists except as it is realised in sound, projected in light, mechanical contact or the like. All knowledge rests on sensitivity. (Gibson, 1966: 28)

Advocates of Gibson's theory perceive his legacy as potentially healing the rift between the sciences and humanities. In *The Reality of Illusion* (1996), Joseph D. Anderson develops an ecological approach to cognitive film theory that is driven by Gibson's theories. Anderson (1996: 19) extends Gibson's notion of affordance into the cinematic environment; he states that 'whether one is at-

tempting to understand the landing of airplanes or the viewing of movies, the problem is precisely that of an organism interacting with a contemporary situation using a perceptual system developed in another time for another purpose'. The point is that minds perceive affordance when interacting with the 'energy array' present in their immediate surroundings, whether this is in nature, in a simulation of nature, or, in the case of cinema as Anderson defines it, through our interaction with a 'surrogate environment' (1998: 22). For Anderson, there is an important link between how humans extract information from their environment and our understanding of how the cinematic environment is constituted. He refers to Gibson's ecological account of perception in an examination of some of the key topics of film theory, including: apparent motion, sound synchronicity and continuity.

Joel Kruger (2011), in his analysis of our engagement with music, is also able to illustrate how Gibson's ideas might explain our interaction with media. While appreciating certain types of music, an individual encounters a deep listening experience where a range of 'musical affordances' might be found in the auditory phenomena. Here, Kruger (2011: 73) describes how a listener will 'draw out certain features of a piece of music – as an enactive and exploratory gesture in response to felt affordances'. In a similar way, theorists of film music draw a contrast between 'hearing' and 'listening'. The former represents a 'lower grade' form of attention, still conscious but a more peripheral operation, whereas the latter describes focused attention on the soundtrack (Kalinak, 1992: 3).

The 'surrogate environment' provided by media technology, whether in the construction or during our appreciation of cinema, appears to extend what can be afforded between sense modalities to that which is beyond the immediate moment (Anderson, 1998). Such an outlook complements the understanding of cinematic technology provided by McLuhan's idea of media as an extension of the psyche. As McLuhan scholar Robert Logan states:

> The content of the movies is moving images, music and the spoken word and hence extends the eyes and ears so that a shot of a scene made in Hollywood or on location is extended to one's local movie theatre at a later time and from their into the eyes and ears of the viewer. (Logan, 2010: 179)

Thus, according to Robert MacDougal, notions of 'affordance and extension can work synergistically' (2013: 181). However, while technological extension, as it is characterised by McLuhan, focuses more on the cultural significance of and the practices that surround tool use, Gibson's notion of affordance provides insight into how we find use in the objects that are situated within our environment. The way these two concepts work to complement and further our understanding of media technology is described clearly by Heidi Overhill (2012). She proposes that since 'an affordance is the relational opportunity that arises between the abilities of the body and features of the world, a McLuhan analysis shows that there are essentially two ways to modify affordances: by changing the world or by changing the user' (2012: 1). The awareness that Gibson and McLuhan bring to our understanding of media environments is that they are living systems. Gibson and McLuhan are able to collapse the dichotomies between nature and technology by approaching media as a process, not as a collection of separate things:

> As with any environmental surround, media and media systems are not passive. Like living systems, media systems are dynamic and active. They exert formative pressures on the entities inhabiting them, just as those entities exert pressures back on their surrounds. (MacDougall, 2013: 195)

2.4.2 The Medium is the Message

Perhaps a less well-known aspect of McLuhan's oeuvre was his pioneering approach towards a psychopathology of the extended mind. However, it is through this approach that McLuhan illuminates the active, reciprocal relationship between mind and media technology. Through McLuhan, Freud's psychopathology of everyday behaviour was extended into an evaluation of how technology acts upon the psyche at a level below the threshold of our awareness (Logan & Braga, 2013). McLuhan presents an idea that there are forces exerted upon us by technology that act upon the psyche in a similar way, as proposed by Freud, to the effects that are exerted upon the individual by their unconscious. Although the context of McLuhan's work was entirely dif-

ferent to that of Freud's, the impact that the Austrian psychologist had upon McLuhan's thinking is often overlooked (Logan & Braga, 2013). Even though the scientific establishment has found issue with the validity of both men's claims (Hobson, 2002, 2004; Williams, 1974, 1981), as a background to the externalist position the connection between Freud and McLuhan uncovers a hidden perspective on extension in action between the psyche and technology.

In one example, Logan and Braga (2013) cite a chapter from *Understanding Media* (McLuhan, 1964) called 'The Gadget Lover: Narcissus as Narcosis' as carrying certain similarities to Freudian analysis. In this chapter, the extension of the mind is viewed in the context of the myth of Narcissus, in which the 'self-amputated image' that Narcissus found reflected in his environment was ultimately experienced as an 'amputation of the self':

> With the arrival of the electric technology, man extended, or set outside himself, a live model of the central nervous system itself. To the degree that this is so, it is a development that suggests a desperate and suicidal autoamputation, as if the central nervous system could no longer depend on the physical organs to be protective buffers against the slings and arrows of outrageous mechanism. It could well be that the successive mechanizations of the various physical organs since the invention of printing have made too violent and superstimulated a social experience for the central nervous system to endure. (McLuhan, 1964: 53)

McLuhan proposes that man becomes numb to the extension of the central nervous system outside of the body, just as Narcissus was numbed to his 'self-amputated image'. McLuhan presents new media extensions as hazarding the potential for extreme shocks, within the psychic or social dynamic, which are, in this instance, analogous to Freud's theory that certain shocks and traumatic memories are repressed by the unconscious. According to McLuhan, the leverage exerted upon us by technological extension, and electronic media in particular, also brought certain, possibly repressed, behaviours unconsciously to the surface. Like Freud, McLuhan believed that beneath the surface of conscious experience churned a pool of invisible forces driving ordinary acts in everyday life. Freud explained this unconscious regulation of behaviour through his notion of the 'censor'. According to Freud, the imbalance caused by an individual's most uncomfortable or dreaded memories is addressed

through unconscious forces of repression or censorship. Under McLuhan, an anti-cathexis of psychic energy is found in the disorientation of extended living caused by electronic media:

> Intensity or high definition engenders specialism and fragmentation in living as in entertainment which explains why an intense experience must be "forgotten," "censored" and reduced to a very cool state before it can be "learned" or assimilated. The Freudian "censor" is less of a moral function than an indispensable condition of learning. Were we to accept fully and directly every shock to our various structures of awareness, we would soon be nervous wrecks doing double-takes and pressing panic buttons every minute. The "censor" protects our central nervous system of values, as it does our physical nervous system by "cooling off" the onset of experience a great deal. (McLuhan, 1964: 32)

McLuhan's application of Freud's notion of the 'censor' characterises a process analogous to the subliminal editing of experience. Despite the novel capabilities that accompany technological extension, the side effects of this editing process can hold many people in 'a lifelong state of psychic rigor mortis, or somnambulism' (1964: 32), or especially during periods of dramatic innovation and assimilation of new technologies.

McLuhan believed that society was largely unaware of the effects of media and of the subliminal conflict that lay beneath the consumption of mass media. His investigations of mental processes (if these illustrations of the collective psyche could be labelled as such) and the extended mind were expressed largely through the use of 'metaphorical probes'. Logan (2013), who collaborated with McLuhan, presents the view that underlying McLuhan's scholarship was the dream to doctor the maladies that arise from a lack of understanding of media. McLuhan (1964:18) likened himself to Louis Pasteur (the father of microbiology); 'telling doctors that their greatest enemy was invisible', but like Freud his work also sought to uncovered where the invisible forces acting upon the mind (Logan & Braga, 2013).

Rather than adopt formal scientific techniques to study the effects of media on the psyche, McLuhan's practice, like Freud's, made use of 'free association'. As a result, the presentation of his ideas bears a closer resemblance to the lyrical explorations of the media environment conducted by artists than the

established academic format of his day. Underlying this approach was his view that artistic practice revealed the subliminal ground of the media environment; hence, artists generally represented an exception to his belief in society's unconscious vulnerability to the effects of media. He wrote:

> I derived all my knowledge of media from people like Flaubert and Rimbaud and Baudelaire… the great instructors in all media are the painters and poets of the later nineteenth century and people like James Joyce and Eliot and Pound and others. (McLuhan *et al.*, 2003: 93, 95)

McLuhan's approach affirms an alternative to the predominantly scientific approach to externalism and cognitive extension presented in the previous chapter. McLuhan's use of the term extension has a literary sense as well as having the literal sense denoted in its use by cognitive scientists and philosophers of mind. The lack of explanation and evidence in much of McLuhan's scholarship has frustrated academics in both the humanities and the sciences, and 'inaccuracies' in his research have been subject to extensive criticism (Stearn, 1968; Williams, 1974: 129; Marshall, 2004). However, his discourse on media has proven to be influential and long-lasting (de Kerckhove, 1997; Levinson, 1997; Logan, 2010). Despite its unorthodoxy, McLuhan's approach was grounded in an understanding of the context and the style of communication commensurate, in his view, to the subject of his investigations. Essentially, he did not attempt to translate the language of artistic experience into one that was acceptable to the scientific establishment, because underlying his approach was an awareness that 'translation distorts and omits' (McLuhan, 1962: 72).

2.4.3 Situated Aesthetics and the Dimensions of Extension

In the last couple of decades, debate and collaborations between the arts and sciences that focus upon the study of mental processes and their possible locations have reached new levels thanks, in part, to an increase in the amount of neurological data that is available. In the *Science of Art* (Ramachandran & Hirstein, 1999), for instance, the authors claim to have discovered 'eight laws of artistic experience… that artists either consciously or unconsciously deploy to optimally titillate the visual areas of the brain' (*ibid.*). This study is not alone in

its attempts to account for art in broadly neurobiological terms (Zeki, 1999; Calvo-Merino *et al.*, 2008); however, the possibility that the aesthetic experience might be reduced to a subfield of neuroscience has produced a range of externalist arguments in response (Manzotti, 2011).

One alternative to the view that aesthetics might be reducible to, or are simply dependent upon neural titillation, is an approach to reality promoted by Pepperell (2011), which he terms 'extensionism'. The extensionist approach takes account of 'the wider, systemic networks of cause and effect that bear on how artworks (and by extension the mind) operate.' (2011:108) Pepperell suggests that the following relations are encompassed by this network:

- the social and economic context within which an artwork is made and appreciated;
- the biographical factors that bear on its production; and
- the historical shifts an artwork might precipitate or reflect.

(*ibid.*)

There are two aspects of our perceptual and cognitive systems that Pepperell draws the reader's attention to: one that 'divides and categorises sensory input'; and another that unites 'the continuities between objects and events' (2011: 118). This process occurs across a plane, which Pepperell refers to as the extended dimension. The contents of the extended dimension are 'properties that are uniquely associated with the object or event in question' and which 'ripple indefinitely through space and time, connecting, however slightly, to countless other objects and events unknown.' (*ibid.*) These properties 'might include:

- the history of the material from which an object is made;
- the artefact's place in a chain of social signification;
- the artefact's links with all the people who have ever come into contact with it;
- the artefact's kinship with other similar objects;
- the artefact's formal evolution, the intellectual or creative energy it embodies;
- the artefact's place in the gravitational field, and so on.'

(*ibid.*)

The key point that Pepperell (2011: 119) makes is that 'no object or event exists in isolation'. He proposes that the dependant properties revealed through an examination of aesthetic objects and artistic activity also applies to the operation of the mind in general. He is not alone in his advocacy for this position; Pepperell (*ibid.*) cites the Buddhist notion of 'dependant origination' as exemplifying a similar outlook.

2.5 Summary

This chapter has highlighted key features of tool use that have allowed humans to achieve 'goals that would otherwise be beyond us' (Clark, 1999: 194). We find a relationship between the human mind and the world realised, in many cases, through our communication and navigation tools. From an analysis of basic tools, such as pointing sticks or drawing implements, this chapter has shown how through the act of using one object to point towards another object (or experience), tool use has enhanced our capacity to engage effectively with our environment. The competencies of the user, even in the more complex networks of digital imaging technologies, collapse material boundaries between subject and object towards an experiential whole. The groundwork of phenomenological enquiry has described instances where the 'terminus' of our awareness extends beyond the body. This is what Heidegger (1927/1962), Merleau-Ponty (1945/2012) and Ihde (1990) all refer to as *ek-stasis* (being outside of oneself). Recent neurophysiological and psychological research on tool use (cited in Clark, 2011) has confirmed the 'neurobiological reality' (Maravita *et al.*, 2003) of this existential ecstasy.

Cinema could play a key role in the debate over whether or not technology extends the mind. But as the work of Gibson and McLuhan demonstrates, views concerning the process of perception through technologies and cultural artefacts are typically subject to context sensitive explanations. Gibson (1979: 295), when he refers to the edited film, describes the experience of cinematic perception or imagination as 'vicarious, an awareness at second hand'. However, in the relationship between the editor and the editing equipment, it is likely that a different teleological dynamic is at play. While it would not make sense to exclude the relationship between editor, filmmaker and audience – and

the knowledge each might have of the other – in the debate over cinema as an extension of the body and of the psyche, the distinction between editing film and an edited film is an important one. Therefore the next chapter will present some of the many parallels made between the mind and cinema; expressed firstly in the theories of non-practitioners, whose analysis is informed predominantly from the experience of watching films and then in the theories of practitioners, whose understanding of editing is informed by their knowledge of the entire filmmaking process.

Chapter 3

Cinema as a Technology that Extends the Mind

3. Introduction

A wide array of ideas have been used to link cognition to the technology of cinema. Many of these ideas are close to, but not exactly the same as, cognitive extension. The differences help to further our awareness of cognitive extension and what it means to act with a mind extended by technology. In the past, cinema has been used as a metaphor to explore phenomena of mind (James, 1890; Bergson, 1907), while theories regarding our mental processes have also been used to explain our comprehension of cinema (Münsterberg, 1916). I will use the first half of this chapter to investigate the two directions that these film and mind analogies travel in: firstly toward a comprehension of mind from the perspective of cinema; and, secondly toward explain our comprehension of cinema from the perspective of mind. Although this process of inference can help to expand our conceptual appreciation of both mind and cinema, the metaphorical perspective often overlooks certain processes occurring at the site of cinematic construction. Rather than link mind and cinema metaphorically, another approach could be to align cognition and the cinematic experience more closely to prostheses and examine cinematic ideas as being the result of a coupling between internal cognitive processes and external information processing. In the second half of this chapter, I will look at how filmmakers have developed a vision of cinema that appreciated its technology as a kind of perceptual or cognitive prosthesis. Within this context, I will look again at the active role that technology plays in cognitive processes.

3.1 Mind from the Perspective of Cinema

3.1.1 William James and the Stream of Thought

The capacity of cinema to record a realistic representation of the observable world has delighted artists and scientists alike, and many have been inspired to compare this technology with our own perceptual and cognitive processes. With hindsight, some of the early comparisons between mind and cinema

might be seen as 'topical analogies' that reflect a cultural response to a novel mode of documenting the world (Toaro, 2001). However, from a number of these comparisons, valuable observations about the nature of our mental processes unfold. Two important questions arise when we carefully examine the relationship between moving image technology and the mind. Firstly, how is it that a range of perceptual and cognitive processes unite in one moment of experience? Secondly, how is it that we have an experience of succession, rather than just a succession of experiences? Neuroscience takes these questions to task under what is now known as the 'binding problem' (Horgan, 1994). But prior to recent attempts to investigate how neural activity provides physical conditions sufficient for the unity of conscious experience, a similar set of questions was confronted over 100 years ago through philosophical introspection and phenomenological enquiry.

When William James investigated these issues in 1890, prevailing scientific opinion was shaped strongly by claims like that of David Hume, who proposed that thought 'is nothing but a bundle or collection of different perceptions, which succeed each other with an inconceivable rapidity' (Hume, 1740: 252). James took this view into consideration and the very first moving image technologies – such as the zoetrope, which brought apparent motion to what were objectively static images – appeared as appropriate models for the expression of this theory. Thus, he considered whether consciousness was really discontinuous and only seems to be 'continuous to itself by an illusion analogous to that of the zoetrope' (James, 1890: 200). However, James eventually opposed the atomised view of reality that Hume and others followed. While he did consider the possibility of 'inconceivable' gaps in our moment-to-moment awareness, he ultimately found that neither gap nor thought was ever experienced in isolation and hence, despite all possible interludes in our perceptual or cognitive awareness, our present experience never appears 'to itself chopped up in bits' (James, 1890: 239). Thus, what can be described as illusory or as a discontinuity in thought or perception is unlikely to sit in isolation from other expressions of consciousness. He states that 'the transition between the thought of one object and the thought of another is no more a break in the *thought* than a joint in a bamboo is a break in the wood. It is a part of the *consciousness* as much as the joint is a part of the *bamboo'* (James, 1890: 240).

Needless to say, James did not peruse a mechanistic model by presenting the mind as being analogous to the zoetrope. Instead, he found a far better analogy for the quality of conscious experience to be that of flowing water. In the 'Stream of Thought', a chapter from James's *Principles of Psychology* (1890), he describes in detail the fluid nature of mental experience. However, even though James's concept of the 'stream of consciousness' has now been widely accepted (Sacks, 2005), the machine metaphor, which he rejected, is one that now appears to dominate the scientific worldview (Grof, 1985). We find living bodies being likened to 'survival machines' for DNA (Dawkins, 1989) and the brain being compared to a 'belief engine' (Grayling, 2011), a 'sematic engine' (Wilson, 2010), or a 'genetically programmed computer' (Dawkins, 1989).

3.1.2 Henri Bergson's Critique of Cinema as an Intellectual Mechanism

James presented his ideas about the mind and moving images long before cinema had developed the fluid audiovisual dynamic that we are familiar with today. When Henri Bergson confronted the mechanistic worldview with *Creative Evolution* (1907), the technology of moving images had evolved from the zoetrope to the cinematograph, even though at the level of recording and post-production this was still a very primitive apparatus. Like James, Bergson considered what this technology might reveal about our own mental processes, asking whether or not the 'mechanism of our ordinary knowledge' could be considered to be of 'a cinematographical kind' (Bergson, 1907). However, Bergson developed this analogy in order to critique an intellectual, as opposed to an intuitive, approach to reality. In his characterisation of cinema as mechanical, fragmenting and abstracting, he places it on the intellectual side of this intellectual/intuitive bifurcation.

The intellect, according to Bergson, can only grasp reality in static terms; it 'substitutes for the continuous the discontinuous [and] for mobility stability' (Bergson, 1946: 221). The intellect's approach to reality came via what Bergson described as a 'spatializing mechanism'. The concepts and symbols that the intellect retains and analyses are fragments of the continual movement that Bergson considered to be reality; they are abstract boundaries and relations that involve an artificial dissection of life. Bergson likened the me-

chanical process of photography to the intellect, the static result being an abstraction, or 'snapshot', of reality. The static images that were appearing to move in cinema were false images of movement that, according to Bergson, were precipitated by an already false, atomistic, and intellectual model of the world. He criticised the 'spatialized' view of reality presented by the cinematic mechanism and claimed that it is only our habitual perception of movement that hinders us from seeing the mechanical process at play in the cinematic projection (Bergson, 1907).

It appears that Bergson was unconvinced by the illusion of movement that cinema presented. What Bergson saw in the cinematographic presentation of movement was similar to an approach to thinking, which he was highly critical of. 'In order to think,' he proposed, 'a constantly renewed effort of the mind is necessary. Signs are made to dispense us with this effort by substituting, for the moving continuity of things, an artificial reconstruction' (Bergson, 1907: 347). According to Bergson, adherence to this artificial mechanism would never lead to an understanding of how things come to be. He argued that intuition was better suited to the study of change and movement. In reality, movement is recognised by the subject not mechanically, but through an inner awareness of duration. Bergson (1907: 324) viewed duration as a process whereby the present comes into being through the past: '[i]n order to advance with the moving reality you must replace yourself within it. Install yourself within change and you will grasp it once, both change itself and the successive states in which it might at any instance be immobilised'. Thus, Bergson found an understanding of motion deep within the interiority of subjective experience; the subject can understand movement intuitively, because the subject itself is in motion. The subject is distanced from this intuition if, on the static concepts of the intellect, it is placed outside of itself. Thus, for Bergson (1907: 323), through an intellectual mechanism like cinema, 'instead of attaching ourselves to the inner becoming of things, we place ourselves outside them in order to recompose their becoming artificially'.

Cinema is used by Bergson to illustrate the difference between duration (internal time) and spatialised time (external time). The latter, he proposed, was an abstraction occurring outside of the subject; time that is chopped up and measured by the intellect is spatialised time. What is in reality an indivisible

movement or process occurring 'within' is dissected by intellectual mechanisms from outside the subject. Although this is slightly reminiscent of Cartesian dualism, separating internal, unextended and non-spatial mental processes from the physical world, Bergson is actually making a distinction between two conflicting approaches to the temporal domain. In relation to these, Bergson's accusation is that Descartes 'superimposes on the determinism of physical phenomena the indeterminism of human actions, and, consequently, on time-length a time in which there is invention, creation, true succession' (Bergson, 1907: 345). The cinematographic method becomes a means for Bergson to illustrate the limitations of the physical sciences. Time-length, in Bergson's (1907: 342) view, is inconsequential: '[t]ime is invention or it is nothing at all'.

How does this view reflect upon the artistic process? Making the analogy between a child who constructs a puzzle and a painter, Bergson suggests that the time it takes to reconstruct the puzzle could be lengthy or instantaneous but the image will still be the same. However, for the painter, the time taken up with the creation of an image is fused within the image; the 'unforeseeable' moments that lead to the formation of the painting are 'stretched out on an unshrinkable duration' (Bergson, 1907: 341) that is at one with the essence of the artwork.

Unfortunately, although Bergson's analogy of the intellect with film allows him to illustrate the mechanical and spacialising characteristics of this approach to reality, it confines the medium to the negative side of Bergson's dualistic epistemology. This view might be seen to have consequences, especially for the potential of any artistic appreciation of the medium. There is no doubt that Bergson holds the artistic process in great esteem. In his essay *The Perception of Change* (1911: 307), he states that 'great painters are men who possess a certain vision of things which has or will become the vision of all men'. But clearly his views on the potency of cinema as an art form, as a means of representing reality, were weakened by his negative descriptions of the restrictive cinematographic mechanism. Today, accustomed to the specific characteristics of the medium, the world accepts filmmaking as an art form; yet, for the first 50 years of cinema, there was extensive debate regarding whether cinema could be recognised as such. In his appreciation of high art, Bergson rejected cinema. His metaphorical attack on intellectualism confronts a constrained or static view of

reality, but it implies that cinema, like the intellect, is incapable of reproducing the internal movement that constitutes reality.

3.2 Cinema from the Perspective of Mind

3.2.1 Hugo Münsterberg's Photoplay

In his book *'The Photoplay': A Psychological Study* (1916), Münsterberg sought to explain cinema from a psychological perspective and, in particular, the function of the technical devices used by filmmakers for storytelling. Münsterberg is considered by many to have instigated a cognitive approach to study of the moving image (Anderson, 1996; Bordwell, 2012; Carroll, 1988; Smith, 2006). He was a professor of experimental psychology at Harvard University, where he also directed the William James Psychological Laboratory. As a pioneer in applied psychology, Münsterberg laid the foundations of a scientific framework for future film theorists to investigate the perceptual experience and the editing process. While James and Bergson presented views that the human mind is unsuited to machine metaphors, in *The Photoplay* (1916) Münsterberg investigates how films are engineered towards a likeness of our own mental processes.

In his writing on cinema, Münsterberg recognises the potential for film to be used as a tool for psychology; he predicted that 'more than any other art form, the moving images of the future would fall under the authority of the psychologists who analyse the workings of the mind' (Münsterberg cited in Elsaesser & Hagener, 2010: 152). He argues that cinema achieves its narrative sense and aesthetic power through the mimicry of mental acts, and that films are engineered to imitate the way in which we notice objects, remember past events, and experience an emotional charge along with perception of a specific moment. In the introduction to *The Photoplay* (1916), Münsterberg recognises two sides to the medium's development: an outer development (which was technical) and an inner development (which he classified as aesthetic).

At the time when *The Photoplay* (1916) was written, cinema was a new form of storytelling, and a comprehensive explanation of how viewers were able to make sense of the cinematic experience was yet to be developed. Münsterberg noticed that, despite the cuts between shots that led to temporal ellipses and spatial discontinuity, audiences still managed to follow the narrative

sense in cinema. His analysis of cinema drew upon a scientific understanding of the major psychological functions, perception of depth and movement, attention, memory and imagination, and emotions. He emphasised the spectator's agency in all these areas, but he also distinguished between voluntary and involuntary attention, or forces that come from within us and forces that come from outside us. He notes how these forces are intertwined, remarking that there are 'several co-coordinated features' that point to each act of attention (Münsterberg, 1916: 100). For instance, he draws upon the example of how an incomprehensible foreign language is heard by the listener. The spoken thoughts in that foreign language are all joined in a seamless flow of noise; there is no distinction between words. When the same thoughts are heard in the listener's native tongue, 'every syllable carries its meaning and a message' (Münsterberg, 1916: 87) and each utterance can be distinguished as a discrete event. Thus, our perceptual experience becomes filled with associations that would not be present had we not learnt that language.

Central to Münsterberg's thesis on cinema was how editing and framing techniques are employed to imitate mental processes, in particular the flow of thought and sensation in everyday life. And rather than appear 'foreign' to the spectator, the film fits with our 'native' understanding of the world. When he compared the experience of watching stage theatre to watching film, he observed that in the theatre when his attention became fixed upon an object, such as the hand of an actor, all other visual information would fall away. In comparison to watching stage theatre, the cinema viewer is unable to explore the depth of a scene at will. Instead, the framing of a scene, from close-ups to cutaways, is planned and edited so that these shots guide and simulate our perceptual enquiry.

Thus, Münsterberg (1916: 104) declares that the 'close-up has objectified in our world of perception our mental act of attention,' in doing so the edited film becomes an analogue for real-world shifts of attention. He claimed that we understand the collage of thoughts and sensations that constitute the cinematic experience because our everyday life is also experienced as a collage of thoughts and sensations. He also draws an analogy between other shot categories and corresponding mental processes, between 'cut backs' and recollection, framing effects and emotional arousal, crosscutting between scenes and

fluctuations between two topics of thought. Fredericksen summarises these objectifications of psychological processes as follows:

- the close-up objectifies attention;
- flashback objectifies memory;
- flashforward objectifies expectation of imagination;
- fades and dissolves objectify memory, expectation, or the imagination of a character in the photoplay;
- "cutting off" objectifies suggestion; and
- parallel editing objectifies the desire for an understanding of simultaneity.

(Fredericksen, 2009: 431)

Given its power to organise objectified aspects of our mental life, Münsterberg viewed cinema as equivalent to a 'technical simulation of the unconscious' (cited in Elsaesser & Hagener, 2010: 152); just as our attention often appears to be driven by forces that we are not conscious of, the shift between one shot and the next in cinema appears to be guided by forces that are outside of an audience's conscious control. Arguing that cinema should be recognised as a radical development in aesthetics (not just a form of popular entertainment), Münsterberg celebrated cinema as a triumph of mind over matter. He claimed that moving images have 'overcome the *outer* world and social world entirely' and that 'they unfold our *inner* life, our mental play, with its feelings and emotions, its memories and fancies, in material tones which are fluttering and fleeting like our own mental states' (Münsterberg, 1916: 200, my emphasis).

Like James and Bergson, Münsterberg also specifically discusses the illusion of motion and continuity in cinema and its relations to mental experience. He proposed that 'the perception of movement is an independent experience which cannot be reduced to a simple seeing of a series of different positions' (Münsterberg, 1916: 74). Interestingly, Münsterberg has been labelled as both an atomistic and a proto-gestalt psychologist (Fredericksen, 2009). Rather than claim thought to be a matter of one brief impression followed by another, and in a way similar to Bergson and James, Münsterberg argued that thought was a continuous mental activity. This, he suggested, was what brought motion, in the case of cinema, to sequences of still images; in his words, cinematographic movement was 'superadded, by the action of the mind' (Münsterberg, 1916:

83). This assertion that mental acts complete the 'motion' perceived in moving images was essential to Münsterberg's explanation of how cinema and mind function in relation to one another.

3.3 Further Developments and Criticism of the Film/Mind Analogies

3.3.1 Criticism of Münsterberg's 'Mentalistic Analogues'

Münsterberg's explanation of cinematic devices as analogues to mental processes is not without its critics (Carroll, 1988; Fredericksen, 2009; Wicclair, 1978). Carroll (1988: 496) accepts the main thrust of the argument put forward in *The Photoplay*, writing that: 'audiences are able to assimilate cinematic conventions exactly because those conventions are modeled on prototypical psychological processes with which they are already familiar'. But he questions what we can learn from the claim that close-ups are analogous to processes of attention, or that flashbacks are objectifications of memory, when there is still so little known about how these psychological processes operate. He is doubtful that these objectifications really exhibit the same characteristics as they do when they appear in consciousness. Münsterberg is unable to specify which dimension of mental correspondence this analogy is drawn across. Carroll observes that, in reality, objects can be attended to from a distance without the change in scale exhibited by a close-up. Furthermore, unlike the flashback in cinema, our recollection of a past event or image is more often accompanied simultaneously by images that the eyes are witness to. Thus, from a phenomenological perspective, Münsterberg's account of cinematic structures has been seen as flawed (Wicclair, 1978). According to Carroll, the fundamental flaw in basing theories of film on 'mentalistic analogues' is that they are based upon aspects of mental life that are still not fully understood. For, while we might understand the cinematic mechanism, a comprehensive explanation of memory, imagination and attention remains beyond the reach of the physical sciences. Therefore, conceiving of cinema as analogous to mind has 'no explanatory force' (Carroll, 1988: 497).

3.3.2 Film/Mind Analogies in 'Film Theory'

Throughout the 1960s and 1970s, film/mind analogies informed much of psychoanalytical and semiotic film theory. In that period, a systematic comparison between cinema and the psyche occurred, which led to a close interconnection between terms and concepts in the two disciplines (Stam *et al.*, 1992). But unlike Münsterberg's comparison between the technology of cinema and perceptual psychology, film theory grounded in the concepts of psychoanalysis and semiotics attempted to formulate the individual fantasies or social codes expressed in cinema. This thesis is being directed towards study of the process of editing as it is understood by practitioners and not (as outlined in the introduction) as it is understood via the theories of spectatorship and authorship that emerged from that period. This investigation is concerned with establishing the ground of variation within the editor's thinking, not with using cinema to explain features of social, historical, linguistic or psychological discourse. Hence, the film/mind analogies used to support 'subject–position theory' or 'culturalism', and that lead to the "Grand Theories" of cinema (Bordwell, 1996), move outside the scope of this thesis.

The reasons for not appropriating psychoanalytical and semiotic theory further within this thesis are expressed in the underlying dynamics and biases, which coincide with the application of these theories. The language or code that is used or formulated by the analyst in these cases is often outside of the subject's awareness. It is, in other words, a language or code that only the analyst has knowledge of and it is often only the analyst who is capable of translating it. Some might also argue that applying a set of pre-existing psychological concepts and hierarchical relations to filmmaker and audience only leads to a description of the subject's irrational tendencies rather than their rational tendencies (Carroll, 1988). Alternatively, it could be seen as an approach that overlooks the preconscious and conscious aspects of the subject's cognitive and emotional engagement with cinema (Bordwell, 1985).

The use of analogy in apparatus theory is a particularly problematic theory-driven explanation of how the subject is passively constructed through the act of spectatorship. The theory is an example, following on from the work of Jean-Louis Baudry (1968) and Christian Metz (1975), of taking a psychoana-

lytical approach to examine the analogy between the cinematic technology (the camera, the projector and screen) and the suture of the audience. It presents the camera as being analogous to an ideological gaze (Baudry, 1968), and the screen as being analogous to the mirror (Metz, 1975), or the 'mirror stage' in human psychic development described by Lacan (1949). Within film theory discourse, there is some controversy over the way in which this seminal aspect of Lacanian theory has been used to idealise the spectator's ego and this has made apparatus theory particularly susceptible to criticism (Allen, 1999). The mirror, according to Lacanian theory, is both a literal mirror and also analogous to the symbolic space where the infant's ego begins to emerge. In relation to this, one case of criticism in the application of Lacanian theory in film studies has been that it mistakenly conceives of analogies for identities (Carroll, 1988b). However, it is futile to assess the validity of such criticism without entering into the complex psychological ramifications of Lacanian theory and its application within apparatus theory.

Notably absent from most applications of apparatus theory are: firstly the editing equipment; and, secondly investigations of the practitioner's cognitive processes. Proponents of apparatus theory tend to refer to the camera, projector and screen in their examinations of the instrumental base of cinema (Stam *et al.*, 1992), but not to the editing equipment and the practice of editing. One exception to this is made by Kaja Silverman (1983), who conceives of a metaphorical relation between castration and the cut between shots. She argues that editing techniques, such as shot-reverse-shot or the cut between point-of-view shots, provide the 'agency of disclosure' for the dominant symbolic order, structured by whatever negations preceded it – although the actual location of these preceding negations is not specified in her analysis. According to Silverman (1983: 205), the alliance between cuts and narration in classical cinematic texts produce 'castration coherence'. The images that are cut out – by 'unseen apparatuses of enunciation' (*ibid.*) – define the discursive position of the viewing subject, which necessitates not only a loss of being, but also rejects the prospect of alternative discourses. Thus, according to a suture theorist like Silverman, narration 'stiches over the wound that is the subject's castration' and serves as 'literalization of Lacan's theory of the subject's relationship to discourse' (Allen, 2009: 454). That is, the coaction of repressed fantasies in the subject's 'lack of

being' (*ibid.*) are determined by the dominant symbolic codes represented in culture and by the literal loss engendered through the editing process.

The attempts of suture theory to explain how a viewing subject is "stitched together" by the cinematic apparatus have been widely discredited (Carroll, 1988b; Smith, 1995). Whether or not this is because its theorists are revealed as subjects recognising the misrecognition constitutive of their own egos and thus misconstruing the nature of Lacanian theory (Allen, 1999; Copjec, 1989) is, however, not the focus of this investigation. The key point is that apparatus theory is predominantly concerned with linguistic analogy rather than a direct examination of filmmaking practice. Its theorists present the view that the cinematic apparatus is a symptom of human neurosis, repression and ideology (Kickasola, 2009), but they do not explain how we are able to make films or how the editing equipment is made to work by its users. As such, the linguistic bias that underlies the application of psychoanalytical and semiotic theories to cinema studies regularly overlooks the material conditions of working within audiovisual media and the cognitive competencies of those who operate the editing equipment.

3.3.3 Film/Mind Analogies and the Film's 'Body'

Proponents of phenomenology in cinema studies argue that a strict reliance upon the use of analogy can remove us from the lived, material nature of the medium, or what Vivian Sobchack (1992) refers to as the film's 'body'. In her phenomenological study of the film experience, Sobchack (1992: 17) states that use of metaphor in film theory, and the metaphor of the mirror in particular, construes 'the very ontological being of cinema as substitutive (rather than expansive) and deceptive (rather than disclosing)'. According to Sobchack, explanations of cinematic comprehension originating in the predetermined logic of language neglect the viewer's sensory experience as the foundation of the cinematic understanding. It might be that our comprehension of cinema is distributed between both; however, Sobchack makes a powerful case that provisionally it is the perceptual aspect, which is the key reason behind how we find meaning in the moving image.

In *The Address of the Eye* (1992), Sobchack presents useful synopses of and a comparison between the psychoanalytical approaches that follow Lacanian theory and those influenced by Merleau-Ponty's existential phenomenology towards a semiotic phenomenology. While we may accept, according to Sobchack, that both approaches correlate language to being, Lacanian theory proceeds from the premise that 'the structures of language determine the structures of being', which is contrary to existential phenomenology, which proceeds from the premise that 'the structures of being determine the structures of language' (Sobchack, 1992: 100). To a certain extent, both approaches point towards universal structures that are expressed through the 'competence and context' of that being. However, they start from different positions: the former within language, the latter prior to language. An argument could be made regarding the correlation of these linguistic structures to the internalist and externalist positions outlined in previous chapters. While this might be pertinent to a more general investigation into whether or not meaning is established inside or outside the subject, for the sake of this thesis the competencies and contexts in the editing practice first need to be established.

Sobchack (1992: 100) observes that investigating the subjective being from the psychoanalytical perspective 'begins with a structure and judges individual performance against its "grammar", while phenomenology begins with an individual performance that describes and inscribes a structure whose "grammar" is always emerging'. In other words, Lacanian psychoanalysis assumes a subject inserted into language and uses the concepts of psychoanalysis to position the subject. Meanwhile, semiotic phenomenology describes how the subject positions the self within language, using speech to constitute and reconstitute its own identity. What is more, Lacanian psychoanalysis borrows from a Saussurean position, where signifier and signified are understood as separate aspects of being. In contrast, semiotic phenomenology encounters these differentiated aspects of being as they are embodied within the processes of a lived body.

In sum, limiting our understanding of cinema through objectification, as the case is with a wide range of film theories from Münsterberg (1916) to Metz (1975), requires a pre-given view from outside the subject. This one-sided view of what our engagement with cinema is like, or how we experience cine-

ma, could be considered restrictive and incomplete. An alternative is offered by Sobchack (1992), who, following Merleau-Ponty, proposes that cinema involves a dialectic where cinema is not only understood from the "outside in," but is also experienced directly through a lived body from the "inside out."

3.4 Cinema as Perceptual and Cognitive Prosthesis

> Our organs are no longer instruments; on the contrary, our instruments are detachable organs. (Merleau-Ponty, 1964: 178)

By investigating cinema as a perceptual or cognitive prosthesis, we begin to move away from metaphorical speculation, shifting towards the argument that cinematic technology constitutes part of our mental apparatus. In which case it might first be useful to briefly define the relationship between prosthesis and knowledge. Prosthetic technologies are widely regarded as devices or appendages, extensions to a body that augment the functions of that body. Knowledge acquired through a prosthetic device involves gaining information about the world, which, were it not for the prosthetic technology would otherwise be out of reach. In other words, information that is not known can be realised via the use of a prosthetic technology. Hence, the moving image technology acts not as a visual imitation of the world or a mimic of mental processes, but as an augmentation of our capacity to think about the world. Both Dziga Vertov and Sergei Eisenstein, whose key ideas will be presented in the remaining sections of this chapter, enthusiastically describe a new vision of the world that is made possible through cinematic technology. Their understanding of these prosthetic devices documents a rich avenue of insight that is particularly relevant to the internalist–externalist debate.

3.4.1 Dziga Vertov: Filmmaker as Proto-Cyborg

Active during Russia's social and cultural revolution, Vertov was suitably positioned to articulate the novel perceptual and cognitive abilities that cinematic technology would bring to mankind. While studying at the Psycho Neurological Institute in Petrograd, he would have been exposed to the ideas of Herman von Helmholtz and Ivan Pavlov, and he continued to write on human percep-

tion throughout his life (Cook, 2007). Vertov was also an extremely prolific filmmaker. In the two years after the October Revolution, between 1917 and 1919, he managed to produce nearly 50 films for the weekly Soviet newsreels. *Man with a Movie Camera* (1929), which is widely recognised as the apex of Vertov's career, has provided generations of filmmakers with a moving-image manifesto that eliminates many of the artificial divisions between theory and practice. Giles Deleuze (2013) celebrated the film as expressing a ceaselessly changing reality in which everything interacts with everything else. It is interesting to observe how Deleuze attributes to Vertov's art the same qualities of continuous movement and duration with which Bergson defined reality, but which Bergson had claimed cinema was incapable of representing. Although he is known for celebrating a mechanistic view of the world, Vertov also writes about the interconnection between organism and environment as it unfolds in perception. It has also been argued that an organismic view of the world might have been just as important to Vertov as a machine view (Turvey, 2007). By developing a proto-cyborg depiction of mankind, Vertov covertly challenged many previously held assumptions that man and technology operated as separate entities.

Rather than simulating mental processes or 'objectifying mental acts', as was proposed by Münsterberg (1916), Vertov proposed that cinema presents us with a new way of thinking. Counter to ideas of metaphorical extension, he claimed that entirely new forms of thought could be communicated through cinema. Central to this was Vertov's understanding of the filmmaking practice, in which he saw an original marriage of action and perception:

> 1. kino-eye, challenging the human eye's visual representation of the world and offering its own "I see," and
> 2. the kinok-editor, organizing the minutes of the life structure seen *this way* for the first time. (Vertov, 1984: 21)

The neologism 'kinok', coined by Vertov, translates literally as 'cinema-eye man'. Vertov (1984: 17) believed that the camera was not a substitute for the eye, but was a machine that, when coupled with the user, was capable of extending or creating new perceptions, 'the likes of which only I can see'.

> Free of the limits of time and space, I put together any give points in the universe, no matter where I've recorded them. My path leads to the creation of a fresh perspective of the world. I decipher in a new way a world unknown to you. (Vertov, 1984: 18)

He celebrated the camera's ability to run in constant motion and, when coupled with other machines, move in ways unlike the human body. Cameras travelling at speed, as well as the camera's variable recording speeds, could provide a new view of the world that he recognised as 'wholly different from that of the human eye' (Vertov, 1984: 15). Thus, he opposed recording techniques whose sole focus was mimicking a standardised version of sight. Despite the limitations of the technology at the time, Vertov was convinced that this 'machine-eye' offered a radical solution to the limitations of human sight:

> Our eyes see very little and very badly – so people dreamed up the microscope to let them see invisible phenomena; they invented the telescope… now they have perfected the ciné camera to penetrate more deeply into the visible world, to explore and record visual phenomena so that what is happening now, which will have to be taken account of in the future, is not forgotten. (Vertov, 1984: 67)

Vertov envisioned the development of cinema as the expansion of human vision and, in the process, the human mind towards 'the perfect electric man'. His ideological concerns were directed towards a 'transformation of consciousness' through a certain access to a 'world of naked truth' (Michelson, 1984: xxv). This is summarised in Vertov's formulae 'Kino-eye=the Kino-recoding of facts'. As well as facilitating the 'visual linkage' of people and phenomena separated by time and space, kino-eye meant the 'cinematic decoding of both the visible world and the world that is invisible to the eye' (Vertov, 1984: 87):

> Kino-eye plunges into the seeming chaos of life to find in life itself the response to an assigned theme. To find the resultant force amongst the million phenomena related to the given theme. To edit: to wrest, through the camera, whatever is most typical, most useful, from life; to organize the film pieces wrested from life into a meaningful rhythmic visual order, a meaningful visual phrase, an essence of "I see". (Vertov, 1984: 88)

Vertov regarded editing as the underlying organising principle of the visible world, and as a process practised by the filmmaker from the apprehension of an initial theme through to the finished film-object. To illustrate what he viewed as the fundamental importance of this process, Vertov listed six critical situations in which editing is practised:

1. Editing during observation – orienting the unaided eye at any place, any time.
2. Editing after observation – mentally organizing what has been seen, according to characteristic features.
3. Editing during filming – orienting the aided eye of the movie camera in the place inspected in step. Adjusting for the somewhat changed conditions of filming.
4. Editing after filming – roughly organizing the footage according to characteristic features. Looking for the montage fragments that are lacking.
5. Gauging by sight (hunting for montage fragments) – instantaneous orienting in any visual environment so as to capture the essential link shots. Exceptional attentiveness. A military rule: gauging by sight, speed, attack.
6. The final editing – revealing minor, concealed themes together with the major ones. Reorganizing all the footage into the best sequence. Bringing out the core of the film-object. Coordinating similar elements, and finally, numerically calculating the montage groupings.

(Vertov, 1984: 72)

Thus, Vertov speaks of editing as something occurring throughout the filmmaking process, as an ongoing organising occurrence. His conception of editing also reveals a task beyond the mere assembly of audiovisual material, towards what he describes as 'the complex art of film writing'. Under Vertov's dictum, the shots 'enter into organic interaction; they enrich one another, combine their efforts, form a collective body, thereby releasing surplus energy' (Vertov, 1984: 272). Vertov's conception of editing expands the context of the phenomenon beyond the editing suite so as to include the intentional forces that orientate the filmmaker's point of view. Such forces also lie hidden in our everyday engagement with the world, in the form of beliefs and perceptions that, although often unarticulated, act to influence our decision-making.

Given the themes that Vertov investigated through his films – human activity, rural and urban environments, the interaction between man and machine and, in particular, communication and transportation – it is unsurprising to find some overlap between Vertov's works and ecological accounts of perception and media. In particular, these include Gibson's account of the interdependence between perception and action (Gibson, 1966, 1979) and McLuhan's understanding of technology as an extension of the body and media as an extension of the psyche (McLuhan, 1962). However, existential phenomenology also uncovers a perspective that parallels Vertov's. Sobchack (1992) – building on Merleau-Ponty's enquiry into the unified body image, motoricity and mechanistic physiology (Merleau-Ponty, 1945/2012) and Ihde's investigation of instrument-mediated perception (Ihde, 1986, 2009) – also describes these embodied and extended relations in action via our cinematic apprehensions of the world:

> The camera's talents allow for a genuine, if abetted, human perception of the world, the extension of human intentionality that can realize itself in its objects through a 'better' embodiment than the human eye. Extending our relations with the world. (Sobchack, 1992: 184)

Although the camera was celebrated by Vertov as an improvement on the human eye, capable as it was of a 'kino-recoding of facts', the loss of fidelity in the photographic and cinematic image has proven to be a critical issue for some. The main issue is not over likeness in the colour or resolution of the image produced by the prosthetic eye, but is instead over the absence of the tactile values that fill our vision of the world beyond the screen. It is the flatness of the cinematic image that some will always consider unreal. A sphere, for instance, might appear to the eye as a flat disc were it not for the sense of touch that informs us of the properties of space and form (Gombrich, 1992). While in painting the ambiguities of the third dimension were investigated technically by artists, film and video only provide a transcription of the scene that is instantaneous and formulaic. Cameras might be able to record more light and colour information than the human eye, but this is the sense of sight alone; it is the abstraction of vision from the feeling body that leads to an experience of the flatness of the screen image. Thus the communications media of the electric age,

according to McLuhan (1961), enhanced the geometrical function of the eye and obsolesced its role as a tactile organ.

According to McLuhan (1961), the flatness of the image is not simply a symptom of the amount of information that the technology is able to process but is a result of the fact that the technology is restricted in terms of how it can process that information. Normally, the sensory modalities of touch and sight merge within a subject's experience, but spectatorship involves an experience where the boundaries between the sensory modalities have been artificially divided and then rejoined. This separation between sensory modalities, however, was not a concern for Vertov in his characterisation of the kino-eye. As a cameraman, Vertov experienced the world through a broader scope of sensory-motor processes than those of an immobile spectator, so it is hardly surprising that he did not show concern over what others might describe as a loss of tangible form.

In a phenomenological analysis of the cameraman's perception, the world becomes the "terminus" of the instrument-mediated perception (Sobchack, 1992). For the cameraman, vision is extended into the handling of the prosthetic eye; the cameraman holds the visual world in a box, a box that can be moved or – as was the case with Vertov – strapped to a motorbike, winched across a river, or placed on a track beneath an oncoming train. The material boundaries between the camera and the cameraman's body might be considered factual, but this does not account for the user's experience, in which they attain transparency in a similar experiential relationship to the user's other organs. As Merleau-Ponty (1945/2012) observes, the action and agency incorporate the space of an instrument into the user's bodily space. Therefore, once a 'new motor habit' has been established divisions between user, instrument and any functional signification (such as focus rings or aperture settings) blend. And as these divisions blend, the prosthetic eye is experienced as a transparent perceptual extension incorporated seamlessly with the motor action of the user.

Perhaps the crucial step that consummated Vertov's radical approach and enabled him to peruse his vision with such integrity was his break with traditional narrative cinema. Amongst the many programmes, manifestoes and theoretical texts that he produced, Vertov directs strident vehemence towards traditional storytelling, which is often intertwined with the rhetoric of the

communist revolution. 'Filmdrama', according to Vertov (1984: 71), was 'the opium of the masses'. His goals and the goals of the kino-eye group, which he spearheaded, were not directed towards the fulfilment of pre-structured narrative themes and were instead intended to find new ones in life and film's raw materials. For instance:

> 'Kino-eye', flinging itself into the heart of the apparent disorder of life, strives to find in life itself the answers to the questions it asks: to find amongst the mass of possibilities the correct, the necessary fact to solve the theme. (Vertov, 1984: 87)

But not only did Vertov apprehend a new way of thinking through the process of filmmaking, he also believed that this opportunity would be present for the audience, liberating them from a traditionally conditioned view of the image. He worked towards making 'the passive, cathartic, emotionally manipulated mode which is normal in the popular cinema culture' impossible (Le Grice, 2001: 49).

Vertov gave great attention to considering the social effects of cinema's formal construction, in the context of both the Soviet revolution and the nature of man. 'The question of kino-eye,' he states, is that 'of organizing the worker's vision' (Vertov, 1984: 88). Given that the worker cannot see the relationship between his work and the work of others with his own eyes, cinema offered the worker a new way to perceive this relationship.

The new view that cinema offered positioned images of worker, community and environment alongside one another and allowed the worker to reflect upon this positioning. Due to his opposition towards 'filmdrama', instead of situating the worker within a traditional narrative structure, he expressed their relationship to the natural and technological environment by using a range of strategies, including visual analogy and rhyme, rhythmic patterning, parallel editing, superimposition, accelerated and decelerated motion, and a wide range of camera angles and movements. Although some might have regarded these methods as technologically determined effects that produced a fragmentary and disconnected vision of the world, Vertov (1984: 88) considered them to be more than 'mere tricks or special effects but as normal technique which should be used as widely as possible'. He considered their purpose

to exceed entertainment, with them constituting a revolutionary intervention involved in changing not only Soviet culture but also the very nature of man.

3.4.1.i Vertov and Technology Studies

With the kino-eye and kinok-editor, Vertov produces one of the earliest conceptions of a thinking body forming between humans and technology. What we may now take to be a proto-cyborg vision of bodily knowledge intimately interwoven with processes of tool use is echoed in the ideas of Donna Haraway (1991). Haraway expands the idea of a cyborg far beyond the practice of filmmaking; nevertheless, the artistic processes involving prosthetic vision and cognitive extension that Vertov describes relate strongly to aspects of her view. Particularly relevant is the way Haraway addresses the recognition of the self in relation to technology. For instance:

> What constitutes an apparatus of bodily production cannot be known in advance of engaging in the always-messy projects of description, narration, intervention, inhabiting, conversing, exchanging and building. The point is to get at how worlds are made and unmade, in order to participate in the process, in order to foster some forms of life and not others. If technology, like language is a form of like we cannot afford neutrality about its constitution and sustenance. (Haraway, 1991: 63)

> Technology is not neutral. We're inside of what we make, and it's inside of us. We're living in a world of connections – and it matters which ones get made and unmade. (Haraway, in Kunzru: 1997: 6)

For Haraway, our ability to make or unmake connections lies both within us and outside of us and, by extension, the filmmaker's desire to make these connections concrete is bound up with cinematic technology and the cultural context of their artwork. Expanding upon this Deleuze observed how the arts or sciences or even philosophy are conventionally taken as distinct contexts for the production of knowledge and that emerging ideas are shaped by the characteristics of these contexts. He states that 'ideas are already engaged in one or another mode of expression at the moment of their consecration' (Deleuze, 1987). Just as ideas in the arts or sciences are not to be treated in the same way, the use of one technical method or another may be considered in-

strumental in the formation of an idea. The imagination cannot be separated from technology and neither can technology be separated from the filmmaker's desires (Pepperell & Punt, 2000). The future of our desires, or our will to connect with the world, can in some cases only be made available to us in the presence of technology. Technology, along with the imagination and desire, forms part of 'a non-reducible matrix' in the histories and possibilities of human creativity (Pepperell & Punt, 2000: 25).

3.4.2 Sergei Eisenstein's Theory of Montage

While the films and essays of Sergei Eisenstein may be more focused upon dramaturgy than those of his contemporary Dziga Vertov, their concern is no less tantamount to the application of cinema as a tool for thought. Both directors played a key role in establishing an approach to cinema known as Soviet montage; it is subject to a field of research in its own right and plays a significant role in the history and theory of cinema. The wider context and extensive critical analysis of Soviet montage is beyond the scope of this enquiry, but many aspects of Eisenstein's theory of montage are of relevance. Presently, my aim is to focus on those aspects of Eisenstein's theory of montage that are most appropriate to cognitive theory, as well as the sections of Eisenstein's theory concerned with 'cinematic thought' and his understanding of how the mind works. In contrast to Vertov, who conceived of editing as occurring throughout the production process and emphasised the sensory motor activity in the user's close relationship with the cinematic technology, the aspects of Eisenstein's theories that have garnered the most critical attention are his theories on the intellectual advance transpiring from moving image sequences and audiovisual correspondences.

It is fair to say, though, that the many texts authored by Eisenstein express a belief in more than one theoretical system concerning the mind in relation to cinema. David Bordwell (1974) has discerned at least two distinct phases to Eisenstein's theories of cinema, each of which is decisively shaped by the theory of mind that he presumed at that time. The first phase (during the 1920s) responded to physiology and dialectic materialism, whereas the second phase (during the 1930s) was more concerned with psychology and empiricism.

Thus, Eisenstein's theories reflect 'a behaviourist epistemology on the one hand and a private-language epistemology on the other' (1974: 44). In *Eisenstein's Epistemological Shift* (1974), Bordwell charts the context for Eisenstein's thinking from the Pavlovian physiology that ran though Soviet thought in the 1920s, to the publication of Vygotsky's *Thought and Language* (1934). The turning point for Eisenstein is expressed in an address he gave at All-Union Conference of Soviet Cinematography in 1935 (the content of which appears in his 1935 essay *Film Form: New Problems*). Bordwell (1974: 45) also presents Eisenstein's 'troubles with the Stalinist film industry' and 'broader changes in Soviet ideology' as further impetus for the filmmaker's theoretical shift.

3.4.2.i Sergei Eisenstein's 1920s Theory of Montage

In *The Dramaturgy of the Film Form* (1929b), Eisenstein describes the relation between mind and cinema as a cognitive circuit that assimilates seemingly isolated, external events 'into the brain'. Following the dialectic materialism of Marx and Engels, he advocates that correct thinking, in both philosophy and the production of art, is dialectical. Art, according to Eisenstein (1949: 46), was charged with the task of 'forging' – in the minds' of an audience – 'intellectual concepts from *the dynamic clash of opposing passions*.' He posited that the following three dialectic principles were true to every art form:

- the interaction of the two produces and determines dynamism;
- the quantity of interval determines the pressure of the tension;
- the spatial form of this dynamism is expression; and the phases of its tension: rhythm.

(1949: 46–47)

This was four years after the publication of the *Dialectics of Nature*, in which Engels (1925/1987: 356) elucidates on the three laws of dialectics: 1) 'the transformation of quantity into quality and vice versa,' 2) 'the interpretation [and struggle] of opposites' and 3) 'the negation of the negation'. It would be difficult to dispute the impact of dialectics on Soviet thought; for example shortly before his death, Lenin (1922: 223) had advocated 'the systematic study of Hegelian dialectics from a materialist standpoint', and in the posthumous

publication *On the Question of Dialectics* (Lenin, 1925) he had urged for the validation of dialectics as a law of the world and a 'law of cognition'. For the dialecticians of the time, such as Kornilov, 'consciousness became defined as a "property" of the most highly organized matter known to science: the human brain' (Bordwell, 1993: 128). Hence, this was a time when Eisenstein was more than likely to have adopted the view that 'matter is the ultimate form of being and mind is reducible to material functions' (Bordwell, 1974: 33).

Throughout the 1920s, Pavlovian physiology also operated as a powerful force within the Soviet academy. According to Pavlov, our response to a stimulus, the reflex, was publically variable and experimentally observable. The reflex was seen as the basic measurable unit of being, out of which behaviour could be constructed. In his 'theory of artistic stimulants', the first basic physiological unit of measurement that Eisenstein (2010a: 241) identified was 'attraction' as 'the unit which will measure the influence exerted by art!' He defined 'attraction' as any element in an artwork that 'subjects the spectator to a sensual or psychological impact, experimentally regulated and mathematically calculated to produce in him certain emotional shocks' (2010a: 34). Later, when he becomes more concerned with the specific artistic conventions that are born of culture and ideology, Eisenstein replaced 'attraction' with more conventionalised signs; from then on, he formalised 'the fragment' as the basic unit from which the artwork is built.

Even though 'the fragment' represented a basic unit from which artwork could be produced, this was a theory without a structure. Eisenstein's famous solution was the concept of montage. One of Eisenstein's key contributions to theory in cinema was his attempt to categorise the various dynamics between the aforementioned cinematic fragments. His initial characterisation of montage was as 'the conflict of two fragments side by side' (2010a). In the 'methods of montage' that he outlines in *The Fourth Dimension in Cinema* (1929b), he develops a typology of editing that leads from metric montage to rhythmic, tonal, overtonal, and finally intellectual montage. The methods of montage that he expounds are correlated, in terms of their effects, to sensation, emotion and cognition, in what Bordwell (1974) describes as Eisenstein's triadic model of consciousness. Thus, metric montage is a kind of 'artificially produced image of motion' or kinaesthesia. The categories of rhythmic, tonal and overtonal

montage are identified with emotional response and intellectual montage correlated to 'lived thought' or cognition. Through his typology of editing he categorises each 'dialectical jump' from 'quantitative regroupings' towards the formation of a new 'qualitative sign'. But he emphasises that these categories are not characterised by 'external signs', but by the specific quality of the process.

Through montage, Eisenstein sought to present the viewer with the visual equivalent of thesis and antithesis, so that the viewer's brain might automatically execute cognitive processes that proceed towards a synthesis of ideas. The notion of 'intellectual montage', for example, establishes that the collision of ideas implicit in two shots can extend both ideas towards a new meaning. This was described by Eisenstein as a 'third something', one that was only available through such juxtaposition and clearly originated from the activities' material substrate. Thus, montage in this phase of Eisenstein's film theory is a 'characteristically modernist notion, seeing the artwork's context not on the analogy of organic unity but on that provided by physics: unity as the dynamic tension of interacting particles' (Bordwell, 1974: 35). According to Ivanov, who Eisenstein met with frequently during the 1920s, Vygotsky edited the theatre section of *Polesskaya Pravda* at a time when Eisenstein still worked in theatre. In fact, it was the discovery of a manuscript for Vygotsky's *The Psychology of Art* in Eisenstein's private archive that led to it being republished (Ivanov, 1976). There are clear similarities between Eisenstein's early theories of montage and Vygotsky's view that aesthetic experience is founded on the conflict between form and content. 'By making opposites collide, [the artwork] destroys the effect of content and form, and initiates an explosive discharge of nervous energy' (Vygotsky, 1925: 215).

During this period Eisenstein believed that each type of edit was reducible to a physiological response. Therefore, he saw no ultimate difference, in principle, 'between the motion of a man rocking under the influence of an elementary metric montage and the intellectual process within it, the intellectual process is the same agitation, but in the dominion of the higher nerve-centres' (Eisenstein, 1949: 82). Gradually, however, Eisenstein's own conception of the spectator's experience of an artwork shifted from one that was driven by 'I hear' or 'I see' to one of 'I feel' (Bordwell, 1974).

In his writing, Eisenstein develops a conception of montage that extends beyond the craft of cutting and joining together fragments of celluloid. In an essay entitled *How I Became a Director*, Eisenstein (2010c) wrote that, in the 1920s, he was aware of William James's formulations on emotion. Eisenstein knew of and was influenced by James's famous statement that: 'we are not crying because we are sad, but we are sad because we are crying', which proposes that 'without bodily states following perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth' (James, 1884: 190). Eisenstein carries this knowledge into his theories on cinematic affect. His writing reflects a fascination with how emotion was born out of the expressive phenomenon mimetically reproduced by actors and then the 'simultaneous' response shown by members of an audience, or by the real emotions that accompany fictitious elements of dramaturgy. What he observed was that 'as a result of "fictitious" action, the viewer can experience completely real, concrete satisfaction' (Eisenstein, 2010c: 286). These observations of actor–audience relations led to a key moment in Eisenstein's thinking, a leap in deductive reasoning that the director compared to the inference from a falling apple that led to Newton's formulations on gravity. However, it was not until later in his life – when he broke away from the didactic reflexology that characterised Pavlovian physiology – that the influence of James's radical empiricism entered into his theories on montage. Ultimately, Eisenstein (2010b) treated acting as a form of montage between actor and spectator that overcame the spatial and temporal separation between the two subjects. In this context, he presented montage as an 'emotional technique common to both actor and spectator'; thus, the process of editing extended not just through 'a unity of method between frame and montage or between montage and the method of sound films, but also another important methodological unity: with the actor – with man' (Eisenstein, 2010b: 311).

Thus, underlying Eisenstein's view was the fact that the processes of montage, which served to promote direct reasoning in the mind of the viewer, were direct observations of how audiences responded to his art. This is accompanied by methodical descriptions of the filmmaking process that are framed by his theory of montage. In *A Dialectic Approach to Film Form* (1949), for instance,

he describes the procedure for promoting direct reasoning in the mind of the viewer:

> Step by step, by a process of comparing each new image with the common denotation, power is accumulated behind a process that can be formally identified with that of logical deduction. The decision to release these ideas, as well as the method used, is already intellectually conceived… The conventional descriptive form for film leads to the formal possibility of a kind of filmic reasoning. While the conventional film directs the emotions, this suggests an opportunity to encourage and direct the whole thought process, as well.
>
> (1949: 62)

As well as serving as a useful description of Eisenstein's thinking process, this extract also highlights two issues in particular that are often used in criticism against Eisenstein's theory of cinema. The first reveals Eisenstein's approach to the film art as being methodical and conceived of intellectually (as opposed to Vertov's attempts to capture 'life as it happens'). The notion that editing as a purely intellectual exercise has been seen by succeeding generations of filmmakers as a particular weakness of Soviet montage theory. Andrey Tarkovsky (1987), for instance, talks of the editing practice not as an intellectual exercise, but as a 'search for time' and hence a creative process that 'is not thought up, not composed on an arbitrary, theoretical basis, but comes into being spontaneously in a film' (1987: 120). The second issue is the conflict between promoting direct reasoning in the mind of the viewer and directing the 'whole thought process', the latter edging towards preprogrammed outcomes that appear ominously didactic besides post-structuralist theories of art (Barthes, 1967). To a certain extent, Eisenstein openly engages with these contradictions. In *A Dialectic Approach to Film Form,* Eisenstein (1949: 48) emphasises a point of view that '[art] is always conflict, according to its methodology', which is in a sense a further endorsement of the collision of opposites that defines dialectic reasoning.

3.4.2.ii Sergei Eisenstein's 1930s Theory of Montage

Eisenstein's writing in the 1930s reveals a distinctly introspective turn in some of his thinking. He becomes concerned with catching the delicate inner move-

ments of the mind, through listening to one's own train of thought and attempting to apprehend how we talk to ourselves, as distinct from talking out of ourselves (Eisenstein, 2010b). In the 1930s, when under the influence of a private-language epistemology, his writing on art and cinema tends to be framed by three crudely outlined theories of human concept formation: 'inner monologue', 'sensuous thought', and 'depiction/image' (Bordwell, 1993). In a move away from theories of mental activity conditioned purely by physiology, he states in a speech to the Union of Soviet Film Workers that: 'the age of form is drawing to a close. We are penetrating matter. We are penetrating appearance into the principle of appearance. In doing so we are mastering it' (Eisenstein, 2010b: 38). This move, according to Bordwell (1974), has usually been considered as showing him bowing to the pressures of a Stalinist purge of formalism, but it also marks his move away from materialism.

In what appears to be a step away from intellectual montage, Eisenstein employed the idea of the 'inner monologue', which had as its source a Joycean model of mind. Eisenstein read *Ulysses* in 1928, and he presented a lecture on Joyce to the State Institute of Cinematography in 1934. In this lecture, Eisenstein (2010c: 141) observed the phenomenon expressed and expounded on in literature by Joyce that when 'you think to yourself you don't use words, you have another system. Some words you have, some you think in images, and from that is formed an arrangement of speech which, if you were to say it out loud would be incoherent'. Eisenstein (2010b: 235) believed that cinema would be able to go further than the 'alogical system' of thought developed by Joyce because 'only a filmic element can capture the idea of a man's stream of consciousness in a state of emotion'. Eisenstein planned a semi-coherent stream of impressions, associations and memories in the scenarios for *MMM* and *Moscow*, but neither project reached production. However, there are two further conceptions of mind – 'sensuous thought' and 'depiction/image' – that proved to be more significant to Eisenstein's later theory.

The key issue that Eisenstein was addressing in this later phase of his theorising was whether all the focus that he had previously given to the film's construction had somehow weakened the emotional and figurative comprehension of the artwork. Intellectual cinema was not, Eisenstein stressed, to be considered the content of the film and could not be justified in terms of a compre-

hensive basis. Although he did not abandon 'intellectual montage' completely, maintaining that its role was important in identifying fundamental elements of the film, this latter phase of Eisenstein's montage theory attended to the emergence of subjectively felt aspects of reality. 'Sensuous thought' focuses upon immanent formulations, whereas 'inner speech' (as opposed to uttered speech) is constructed. Thus the concept of 'sensuous thought' is described by Eisenstein (1949: 130) as 'the flow and sequence of thinking unformulated into the logical constructions in which uttered, formulated thoughts are expressed'.

'Sensuous thought' revealed formulae for achieving an emotional and imagistic structure. He proposed that the passage, via cinematic montage, through inner thought could be used to express a fundamental law underlying the construction of form and content. He thus developed the concepts of 'sensuous thought' and 'inner speech' in a move away from the clearly differentiated concepts and categories of 'intellectual montage' and towards a more holistic sort of perception that flows within the context of a narrative.

For Eisenstein, the search for 'sensuous thought' ultimately led to qualities of the sublime. He proposed that, by discerning the emotional quality of thought within the 'imagistic' construction, the filmmaker redirects the energy of pathos towards ecstasy. He became fascinated by how artworks had been directed towards or accomplished an ecstatic state and the idea that art was capable of 'artificial psychical regression' toward primitive forms of thinking, phenomenologically identical to the intoxication experienced through alcohol, shamanism and religion. Yet the significance of the term 'ecstatic' – as with Heidegger (1927/1962), Merleau-Ponty (1945/2012) and Ihde (1990) – is derived from the Greek *ex-stasis,* meaning 'to be outside oneself'.

In his writing Eisenstein (1987) cites the example, given by William James, of intoxication under nitrous oxide as one possible expression of ecstasy. What James describes as a reconciliation of conflicting opposites 'melting into unity' while on nitrous oxide, was for Eisenstein, comparable to his own experiences of the sublime in art and cinema. Yet while the manor in which James described his intoxication must have resonated with Eisenstein's own vision of 'the sheer dialectical movement of things' (Bordwell, 1993: 195) he proposed that the most exalted experience of ecstasy was to be found through our participation with art. Hence for Eisenstein (1987: 369), this was not a trip outside

'into nowhere' but 'a transition to something else, to something different in quality, to something opposite from what preceded it.'

Eisenstein's idea of 'sensuous thought' was – according to Bordwell (1974, 1993), Aumont (1979) and Brewster (1974) – derived from a variety of sources. These included what anthropologist Levy-Bruhl refers to as 'prelogical thought', the concept of 'preverbal thought' developed by Vygotsky in *Thought and Language* (1934), and Eikhnebaum's theory of 'inner speech' (1927). In his writing, Eisenstein appears to use 'sensuous thought' and 'inner speech' interchangeably. It should be made clear that inner speech, for Eisenstein, does not derive from linguistic activities; rather, it is closer to the interplay of ideas with sensory qualities. This differs from Vygotsky's use of the term 'inner speech' to denote the internalised abbreviated version of vocalised social speech that emerged after 'preverbal thought'. In comparison to his earlier formulations, the filmic language that Eisenstein theorises about here pays much more attention to the merging of sense modalities. It seeks possession of a dual unity in the progression 'toward ideas at the highest peaks of consciousness' and the 'penetration through the structure of form into the deepest layers of emotional thinking' (Eisenstein, 2010c: 38). Here one should note how Eisenstein's writing during this period coincided with the making of *Alexander Nevsky* (1938) and *Ivan the Terrible, Parts 1 and 2* (1944, 1958) and that it is perhaps though these films that his greatest testament to the emotive power of the cinematic medium resides.

Finally, the culmination of Eisenstein's theories on the editing practice is presented in his essay *Montage 1938*. As a response to his critics' objections that in his earlier theories he had over-stressed the potential of juxtaposition and neglected the features of the images themselves, Eisenstein developed his most sophisticated cognitive theory of cinema. In this essay, he reveals a 'synthesising consciousness' that binds the elements a perceiver grasps in an external form into a 'common essence' that is evoked internally. The two terms that lead this theory are 'image' (*obraz*) and 'depiction' (*izobrazhenie*). They are presented together as the concept of 'depiction/image' and can be seen as the climax to his theories of montage.

Although the idea that the image in art fuses an objectively external form with an image internally perceived had already made its mark on Soviet thought thanks to Vissarion Belinsky (1811–1848) and Alexander Potebnya

(1835–1848), it was not until the 1930s – when there was a turn away from formalism towards socialist realism – that this theory re-emerged to assume a central position within Soviet aesthetic theory. By fusing this theory with his own theory of montage, Eisenstein defies his critics and maintains the place of montage at the heart of the aesthetic experience. The result, which follows a broadly empiricist approach according to Bordwell (1993), accounts for how sensory data merge in the formation of ideas.

Eisenstein begins his analysis of the aesthetic experience in *Montage 1938* with the proposition that parts, isolated through perception, are recognised through the image as a whole. He illustrates this using the image of time. He observes a clock, taking in all of its component parts and the markings on its surface. An understanding of time, he proposes, requires that each perceived part must merge into a meaningful whole. However, he also notes that the image of time will not arise in the mind of the subject unless the imagination is schooled to elicit a particular response to this figure, i.e. 'read' the clock face and tell the time. In this example, there is the 'image' (*obraz*), experienced through ideas (potentially rich with further associations), and 'figures' or 'depictions' (*izobrazhenie*), consisting of the formal, plastic elements of the scene. Being able to tell the time, according to Eisenstein (2010b: 300), requires synthesis between the externally arising 'depiction' and the internally constituted 'image'; 'seeing is insufficient: something has to happen to that depiction, it has to undergo some process in our mind'. This process, according to Eisenstein, requires the 'compression' of mental pictures, of *pars pro toto*, a 'direct and instant connection between the depiction figure and the perception of the image' (*ibid*).

The practice of selecting parts of a scene and combining them into an expressive whole extends, according to Eisenstein, across both art and literature. He illustrates this in *Montage 1938* with a long extract from one of Leonardo da Vinci's notebooks, in which the artist/scientist describes how a deluge might be represented in a painting. The elements of the scene that Leonardo da Vinci depicts – from the pattern of movement that 'establishes' the character of the landscape to the most powerful details ('close ups') expressed by the subjects of the scene – are referred to as a 'montage script' by Eisenstein.

According to Eisenstein, in the search for an image of real significance, the artist who has established a particular theme will employ montage to realise

the image that embodies this theme. He describes a general account of this process as follows:

> A certain image hovers in front of the author's inward eye, an image which for him is an emotional embodiment of the theme of this work. He is then faced with the task of turning that image into two or three *partial depictions*, which in combination and juxtaposition will evoke in the mind and emotions of their perceiver precisely that initial generalised image which the author saw with his mind's eye.
>
> (Eisenstein, 2010b: 308)

However, it is important to stress that, for Eisenstein, 'the desired image is not something *ready-made* but *has to arise or be born from something else.'* (Eisenstein, 2010b: 309) This, according to Eisenstein (yet in the tradition of dialectics), is the dynamism that exists between separate depictions, coordinated through montage, and coming into being in the perceptions of the spectator. A particularly good example of this is the use of repetition in the depiction of a scene and the formation of an image. Eisenstein uses an example from Maupassant's *Bel-Ami*, in particular a scene where the impatient protagonist awaits a midnight rendezvous with his lover. However, when the lover does not show up at the agreed time, the protagonist's plans to elope start to disintegrate. The emotional significance of this moment is impressed upon the audience by repeated depictions of several clocks in several places, marking that hour and each subsequent hour, which stresses the protagonist's torment. Thus, according to Eisenstein (2010b: 304), 'the separate depictions have fused into an image. And this has been done strictly on montage principles'.

Although there are distinct characteristics of the conceptions of montage and cognitive processes that Eisenstein utilises, it would be misleading to see each theory as departmentalised in practice. Eisenstein viewed examining any cognitive structure in isolation as profoundly misguided. He also acknowledges a continuity between 'internal monologue', 'sensuous thought' and 'depiction/image', with each aspect of mental life being discerned through knowledge of the previous aspect. In addition, his later theories of montage demonstrated how aspects of socialist realism were informed by the techniques established by the earlier formalist concerns of Russian constructivism

(Bordwell, 1974). Underlying Eisenstein's approach to his theory of montage was a belief that the process of image/concept formation in ordinary life served as a prototype for the methods to be applied by artists to their art. However, Eisenstein's (2010b: 302) view was that, while the chief concern in ordinary life was only the product of concept formation, 'a work of art directs all the subtlety of its methods toward the process' and also prolongs or extends the process of perception, making this process an aesthetic end in itself (Shklovsky, 1917). Ultimately, Eisenstein (2010b: 302) envisioned a cinema that, rather than merely presenting the spectator with the results of past depictions or readymade structures, could produce an image of vitality that involved audiences in the 'permanently occurring process' of consciousness.

3.5 Analogy, Cognition and Montage

While the foundation of the extended mind thesis rests on an appreciation of processes extending thought through the movement of things (Hutchins, 1995; Clark, 1999, 2011), with cinema it is not just the movement of technology in or through space, but also the 'mental connections that can be made by perceptual prostheses' (Lury, 1998: 183) that constitute cognitive extension. The same idea is clarified in Eisenstein's (2010a: 41) early theories of montage: 'an analogous process occurs in the montage of attractions: it is not in fact phenomena that are compared but chains of associations that are linked to a particular phenomenon in the mind of a particular audience'. Eisenstein's key discovery, according to Aumont (1987: 32), was not in highlighting that the image is reducible to the 'analogon' but was in expressing our capacity for the 'analogical', supposed by the 'simultaneous operations of numerous and diverse codes.' The process that Eisenstein realised through montage was not the representation of a fragment of thought, or 'equivalence of perception', but instead processes that recovered an awareness of the extension of thought between things.

A more recent view presented by Douglas Hofstadter (2001) is that 'analogy is the core of cognition'. He proposed that we think through substitution and analogy: '[to] think is to move fluidly from concept to concept – in other words, to leap from one analogy-bundle to another' (2001: 500). The similarity to Eisenstein's 'depiction/image' concept is clear. Hofstadter also

proposes that by using repeated analogies of a concept we are able to expand the meaning of that concept. How do these theories of analogy sit within the debate about mental location? While both internalist and externalist points of view hold that meaning is determined by reference, the externalist perspective differs in the claim that meaning is embedded externally in the world (Gallagher & Zahavi, 2012). Hofstadter (2001), on the other hand, with a view more typical of the internalist position, makes the case that our analogical connections take place 'inside the head, between mental representations'. Or, as Bordwell (2013) remarked in his summation of Soviet montage theory, 'whatever happens between the frames happens in the head'.

How significant is Eisenstein's understanding of his filmmaking practice to the internalist/externalist debate? To begin with, it demonstrates an ambiguous and reciprocal relationship between perceiving the world through the cinematic technology and the equivalence of perception embedded in the cinematic image. Following this, some take the view that Eisenstein's cinema acts as an externalisation of his consciousness and that 'embedded in the structure of the artwork' is the 'embodied structure of the author(s)' mind' (Tikka, 2006: 153). Likewise, his work has been appreciated as demonstrating an ongoing 'connection between the desire to externalize the mind and the rise of mass communication' (Manovich, 2006: 207). There can be no doubt that such views are inspired greatly by the tone of Eisenstein's own theories, which elaborate extensively on the dynamics, conflicts and collisions between the thoughts of an organism situated within the cinematic experience. As surrogates to our internal thought processes, the moving images perceived in flickering shadows are claimed to function as externalised forms of our own mental imagery. These are sequences that, prior to the invention of cinema, were confined to the experience of one individual; what were previously 'unobservable interior processes and representations are taken out of individual heads and put outside' (Manovich, 2006: 209).

However, as an arbitrator of the debate between internalists and externalists, the claim that embedded within media technology are representations of our mental processes is a far weaker version of externalism than the one presented by the extended mind thesis, which has, at its core, a radically different perspective on the relationship between mind and technology. A comparison

between the embedded mind and the extended mind theses formalises this point. According to Rowlands (2010), embedding representations of mental processes in media is not the same as using technology as a tool for thinking. The former suggests that mental representations are determined by our neural processes alone, the latter – the claim presented by the extended mind thesis, posits that mental representations are determined by the combination of both neural processes and extra-neural processes. This point is given further clarity by Rowlands, who states that:

> The idea that cognitive processes are extended can easily tempt us into thinking of mental processes as somehow stretching outside the brain, thus having a definite spatial location but that simply incorporates expanses of the extracranial world. This is, I claim, precisely how *not* to think about extended cognition. In general, cognitive processes have a location that is, at best, vague and may be genuinely indeterminate. (Rowlands, 2010: 83)

The move away from thinking of the mind as inhabiting a fixed location, with a fixed set of relationships, is supported by the conception of mental representations as co-dependent on worldly processes. Instead of presenting the view that our cognitive processes are constituted solely by a fully formed and internally fixed representation of the world, the extended perspective proposes that our brains operate *partial programmes* (Thelen & Smith, 1994) according to *partial representations* of the world (Clark, 1997). This is a view that correlates with that held by anthropologist Marilyn Strathen (1992), in that the individual's relationship to the cultural environment is constituted by *partial analogues*, as well as the purely phenomenological perspective that described the relationship between mind and world as *co-given* (Husserl, cited in Smith, 2009). These converging and incomplete aspects of mind clearly correspond with Eisenstein's description of his editing practice (quoted earlier), where he stated that: 'two or three *partial depictions*, which in combination and juxtaposition will evoke in the mind and emotions of their perceiver' (2010b: 308, my emphasis).

While the concepts above may, for some, appear to offer concluding explanations toward what constitute the formation of meaning in a subject, I now suggest, that the editors' experiences needs to be examined in relation to current filmmaking practices. Their point of view on the activities involved in

the process and practice of editing are crucial to identifying what information is being processed at each stage of the edit. Understanding a notion as abstract as information processing in this context really requires finding a genuine sense of what it like to edit and what the sense making capabilities of editors are.

3.6 Summary

So far, with the exception of Vertov and Eisenstein, the terms of this investigation have stemmed largely from the specialised knowledge of philosophers and cognitive scientists. Meaning that many of the ideas presented, describing the relationship between tools, users and what constitutes the cinematic experience, have derived predominantly from what might be considered outsiders perspective. While the specialised knowledge of philosophers and cognitive scientists provide a valuable approach to understanding this relationship, evidence of how everyday practitioners use cinematic technology and understand the relationship between their thinking, tools and working environment is necessary in order to answer the central questions driving this thesis. In other words, one could not say definitively where information processing takes place during the editing process, or how internal and external forms of information processing relate, without first identifying what constitutes the cognitive process from the perspective of editors and filmmakers. Hence, in summing up the literature reviewed so far in this study, a number of questions come to the fore, supporting the argument for further empirical research of the editing process.

When I introduced this research I made two steps to highlight why investigating the editing process could act as a useful case study in the debate over the location of mind and what constitutes thinking for an editor. The first was to consider editing as a real world activity, albeit one that is mediated by a specific technological environment. Here I have suggested that editing encapsulates a view of thinking as a process that fragments and reunites particular aspects of the world. But is this how most editors view the process? The second step situated the activity of editing within another older idea that takes reality to be comprised of the external world and an individual's internal awareness. Some of the literature reviewed in these opening chapters argues that there are examples of cognitive processes that cannot be understood properly if separat-

ed from the activities and technological environment in which they take place. One would expect therefore that the editing process and the environment built around cinematic technology would be recognised as a clear example of thinking in action. But for further evidence of this we would need to ask how editors view the relationship between their internal awareness and the activities being played out within the editing environment. Where do they situate the thinking, or information processing, that constitutes the editing process?

There is little evidence, in the literature reviewed so far, to show that the role of the editor and their understanding of the editing process have been applied by philosophers of mind to explain the location of our mental operations. This is surprising considering the abundance of literature discussing the relationship between mind and cinema. An appreciation of cinema as an effective tool for studying the mind begins largely because certain aspects of cinema have been recognised as being similar to phenomenal experience.

In this chapter the metaphorical relationship between mind and cinema has been explored to expand our conceptual understanding of both, but it also reveals discrepancies between the two. James (1890) and Bergson (1907) were both critical of the analogy between mind and film because the metaphor alluded to a mechanical process. They argued that the mind is not mechanical, with processes characteristic of a device that can be switched to either 'off' or 'on'; instead, the mind operates under continuous duration. Bergson (1907) in particular saw the mechanical reproduction of an image as an intellectual analogue due to the static fragments that it abstracted from this continuum. Although I would suggest that this analogy also has its limits, due partly to a discontinuity between his theory of cinema and the production process – specifically the network of relations that are active in and around the editing environment today. If one where to recognise the role of the editor and the editing process in greater depth would one continue to argue that the cinematic experience is constituted by exclusively by mechanically reproduced images? It seems premature to reduce the selection and sequencing of moving images to a purely technological process. And the question needs to be posed to editors as to whether they define their practice as a purely mechanical activity.

A key criticism of some of the film theory presented in this chapter is the linguistic bias that drives the "Grand Theories" of cinema. The film/mind

analogies, which play a prominent role within these "Grand Theories" (Bordwell, 1996), have been criticised for obscuring much of what is unresolved about our understanding of mental processes and, therefore, also the construction and comprehension of cinema (Carroll, 1988; Sobchack, 1992). One might propose that it is in fact the translation of phenomenal experience into language, which is responsible for this obfuscation. This however presents a significant problem for the researcher – how can the editors' cognitive experience be described and then analysed without resorting to language? But perhaps this simplifies the problem more than is necessary; the problem is not that language is being used but that the "Grand Theories" of cinema resort to a vocabulary that is not in use. Its theorists refer to concepts that are derived from psychoanalysis and semiotics, but there is no evidence as to whether editors and filmmakers believe they are relevant to the context that they work in, or whether knowledge of these concepts allow thinking in the editing environment to function any more or less effectively. A better approach for studying the location of the editors' mental processes would consider this context. This, it is hoped would lead toward the appropriate method for recording and analysing the concepts currently used by the practitioners, in their descriptions of their cognitive activities.

To a certain extent the intermediary processes between technology and the cinematic experience are already evident in the theories of filmmaking described by Eisenstein and Vertov. These two filmmakers represent two extreme examples of this way of thinking. With Vertov (who pioneered a form of documentary making before the word had been invented) we find a conception of cinema that celebrates the incorporation of cinematic technology into the body schema. Whereas with Eisenstein (who is recognised largely as the director of epic historical narratives) we are presented with theories that tend to analyse the externalisation of internal patterns of thought. Hence with these two distinct types of filmmaking, we find two distinct characterizations of the filmmaker's mental operations; with Vertov's arguably providing stronger support for an extended model of mind. A finer distinction between externalist models of mind, according to Rowlands (2010), occurs between a weak version of externalism – which involves a concept of mind that embeds meaning in the world (embedded mind), and a strong version – which involves integration between

internal and external aspects of mental processes (extended mind). The later is argued for strongly by Vertov through his concept of the kinoks (meaning camera-eye-men) and associated neologisms (Vertov, 1984:17). Whilst Eisenstein's concepts of 'image' (obraz) and 'depiction' (*izobrazhenie*) might lead some to an interpretation of cinema where meaning to be embedded exclusively within neural pathways (the internalist view). Although an argument also exists that the external world plays a critical role in Eisenstein's model of the cinematic mind, as such reference to it acts as an irreducible constituent in the formation of meaning (the externalist view). In the same way that meaning formation in the context of this extended mind model of cognition is be summarised as the convergence between partial representations and partial programmes, Eisenstein (2010b) explained meaning formation to be the combination and juxtaposition of two or three partial depictions.

Considering the detailed description and analysis of a filmmakers cognitive process provided by Eisenstein, as well as the marriage between mechanical and organic processes expressed in the works of Vertov – one might suppose that all the material necessary to construct a case in support of the extended mind could be found in the texts of these two filmmakers. Therefore why not end this investigation with Vertov and Eisenstein? Concluding that the approach described by Vertov corresponds to the active externalism (Clark & Chalmers, 1998) and that the approach described by Eisenstein corresponds to semantic externalism (Putnam, 1975). However rather than bring this study to a premature conclusion, the findings of this literature review may instead inform a tentative hypothesis about the location of the editors' mental processes. Informed by the theories of Vertov and Eisenstein one might propose that: 1) active externalism will be expressed in the relationship between editors and editing equipment, renaming this hypothesis – kinok externalism. 2) semantic externalism will be expressed in the relationship between filmmaker and the cinematic image, renaming this hypothesis – obraz externalism. However to test for kinok externalism or obraz externalism would be problematic for two key reasons. Firstly, in the work of Vertov and Eisenstein we find the stages of the editing process subject to constant revision. These revisions expressed a shift in the relationship to technology, the cinematic image and their own internal awareness. As a result of this there appears to be no constant form of measure-

ment in terms of what these hypotheses would test. Secondly and as a result of this first problem, the historical and individual specificity that informs these hypothesis might be counter productive in that they simply work toward the 'unscientific motley' that Adams and Aizawa (2001) cite in their critique of externalism. However despite these issues the radical changes that filmmaking equipment has undergone since Vertov and Eisenstein still provides a strong motivating factor for an empirical investigation of the editing process as it is experienced today. This is driven in particular by changes such as the move from linear to non-linear editing systems and from analogue to digital formats.

An alternative working hypothesis, which stems from propositions stated at the beginning of this study and which considers the above changes, would be as follows – knowledge of final-cut extends through intermediary operations if a subject's hands-on experience of the editing equipment increases. However testing this hypothesis appears likely to focus on the duration of time an editor has spent with the editing equipment. Are there other factors responsible in linking these intermediary operations to the cognitive process? Considering the variation expressed in the work of Vertov and Eisenstein in the course of their life times, the possibility of further variation across a range of contemporary approaches to filmmaking technology appears just as great. As such, context related, qualitative characteristics may play a strong role in driving the outcome of the editing process. Therefore it would seem fair to ask the question how a filmmakers' work, in terms of genre, form or style correlate to the editing process and the location of their mental processes.

However, to re-frame this investigation toward the relationship between individuals and their work, in terms genre, form or style, would be to enter debates about film aesthetics which have hither to been outside the scope of this investigation. As this investigation continues reference to these debates may be unavoidable, but rather than situate approaches to editing using terms, which often appear to be more relevant to theorizing that occurs outside of the filmmaking process itself a research sample could be found under more straight forward criteria. I suggest that research participants should be identified, predominantly, according to their relationship to the filmmaking equipment. This would not exclude the wide variety of filmmaking approaches relevant to the research question and would help to simplify the initial stratification of further

research subjects. Hence it may be useful to contrast the differences between directors and editors, or those who currently operate the editing equipment and those who observe it in action.

However further issues remain; the concepts presented in the literature review, one might argue, only summarise a particular aspects of the cognitive process and that these are often generated from outsiders' perspectives. They do not reveal the editors' activities or the full range of processes involved in the editing practice. Although it would be easy to predict, even from a shallow experience of filmmaking that technology plays a built-in role in the editing process, it would be far harder to predict, on this basis, where the information essential to the edit is processed. Any experimental method for locating or predicting where this information is being processed would need to take into consideration the wide variety of approaches that constitute the editing practice. Would the information being processed in an experimental context be the same as various stages of information processing that occur over the course of an edit and not just one particular aspect of the edit? There is a strong chance that an experimental setting will produce a different external context for the editor and therefore there own internal experience. A more appropriate starting point would be to have to editors and filmmakers outline the various stages in their cognitive process. From speaking to editors one might find that it is simply a matter of opinion as to where the information is being processed.

Questions aimed toward a research sample, such as the one sketched out above, might be able to negotiate the question of mental location question without being limited by premature theories about what the information processing driving the editing practice entails. For example: what ideas or activities are central to the participants understanding of the editing practice? What are the questions they ask themselves when selecting or sequencing images and audio? What kinds of problems do they encounter and to what extent might these be determined or solved by the tools they use? If so what technological biases are carried by these solutions? How may an editor's practice have developed in relation to changes in the equipment they use? How else might the motivations behind their editorial choices be revealed? Rather than study the editors' practice in terms of a procedure that can be predictably measured, these questions would help to encompass the variety of experiences or relationships that consti-

tute the editing process. This suggests that the next suitable step for investigating this study's central research question would be to adopt a qualitative research methodology.

Having made the distinction between those who operate the editing equipment and those who observe it in action, or the differences between directors and editors, there is now the opportunity to ask what practicing editors and filmmakers consider their relationship to technology to be and how technology affects their thinking. A critical issue here, one might argue, is that many of the above questions are leading in favour of externalism's model of mind – because they are explicit in relating technology to the cognitive process. What then is the most appropriate methodology to answer this study's central questions? It should certainly stand as much chance of finding evidence to challenge the notion of cognitive extension as to support it.

How a qualitative research methodology addresses issues of leading questions is an important factor to consider, but it is not the only one. The context of an interview might evoke a form of popular vocabulary unlike the carefully considered concepts and structures developed by Vertov, Eisenstein or cognitive scientists. Even if this is not the case, a methodology that is grounded in examining what a group of individuals experience should be prepared to recognise how a variety of view points can be brought together under one analytical framework. This is one key factor in making phenomenography a more suitable methodology for this study than other qualitative research methodologies.

The next chapter will focus on what characterizes phenomenography as a suitable methodology for the next step in this study and how these characteristics have influenced the methods of data collection and analysis. Accepting the editing environment as a particularly suitable setting from which to evaluate the location of our mental processes, I propose that the best subjects to unpack the list of cognitive activities that constitute the editing process are directors and editors themselves. The goal underlying this process will be to generate a more encompassing map than the one currently available from the existing literature of how, from the perspective of the editor, cinematic thought forms and leads towards the cinematic experience.

Chapter 4

Research Methodology

4. Introduction

This chapter will focus on three areas: a) defining and explaining the phenomenographic approach to research; b) why this approach is suitable for studying the relationship between editors, the editing technology and the cinematic experience; and c) how the phenomenographic approach has been applied to this investigation into the locality of the mind(s) editing cinema.

4.1 What is Phenomenography?

Ference Marton, a pioneer of this research approach, defines phenomenography as the study of 'the qualitatively different ways in which people experience, conceptualize, perceive and understand various aspects of, and phenomena in, the world around them' (Marton, 1986: 31).

While questions regarding how we gain knowledge of the world are important to phenomenographic enquiry, as a research approach it does not provide a preconceived theory of how knowledge is constituted, and nor does it prescribe a theory of experience or a particular method for researchers to follow (Marton & Booth, 1997: 111). Instead, it encompasses an approach to research that aims to describe the full range of ways in which people in a particular environment experience or understand a phenomenon. In other words, phenomenography seeks to reveal the variety of ways in which humans relate to an environment or a particular process within that environment.

Although phenomenography is often associated with the study of phenomena in the learning environment, there are phenomenographic studies that have explored conceptions of political power (Theman, 1983), investigated ideas of death (Wenestam, 1984), considered experiences of information systems (Kaapu *et al.*, 2006), studied Nobel laureates' views of scientific intuition (Marton *et al.*, 1994a), as well as studies of creative practice-based disciplines, including music (Reid, 2000), design (Drew, 2000a, 2000b) and software programing (Cope, 2004). Rather than conducting an experimental approach to under-

standing experience, phenomenographic researchers examine the understanding of experience outside of an active intervention. That is, the researcher examines how subjects conceptualise a phenomenon in relation to the environment within which it is usually experienced (Ireland *et al.*, 2009). This line of approach is described by Marton (1986) as centring on a 'pure' phenomenographic interest but is also referred to as discursive phenomenography by Hasselgren and Beach (1997).

A key characteristic of the phenomenographic approach is that researchers investigate phenomena using descriptions or conceptions of experience articulated by the subjects of the research. In fact, the approach that phenomenographers take towards their research subjects' experience is said to be a 'second-order perspective'; it views the phenomenon from the subject's conceptions of their experience instead of imposing the researcher's position onto the outcomes (Gerber, 1993; Marton & Booth, 1997). What is important about this view is that it does not prioritise a person's descriptions of their inner world, or their statements about objects; instead, it focuses upon examining the ways in which the participants of a study relate to a particular phenomenon. Marton describes this perspective as being 'simultaneously objective and subjective'. He proposes that the way in which the world is experienced cannot be divided in two, with 'a real, objective world on the one hand, and a subjective world of mental representation on the other' (Marton, 2000: 105). He defines experience as the relationship existing between objects and subjects, encompassing both, with each experience being 'as much an aspect of the object as it is of the subject.' (*ibid.*) Thus, the nature of the 'second-order perspective' described by Marton is considered by phenomenographic researchers to be a non-dual research perspective.

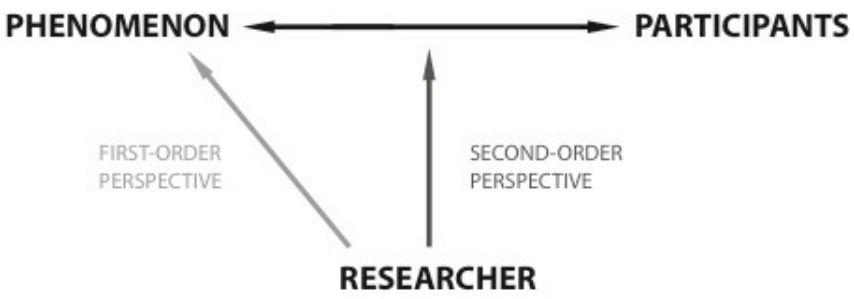

Figure 1: First-order and second-order perspectives (Uljens, 1991)

Phenomenographic research, as shown in the diagram above, does not attempt to focus on the phenomenon itself, and nor does the research focus on the processes involved in how individuals construct a conception of an experience (Crosswell, 2005). Instead, it focuses on the phenomenon and the experiences of individuals by describing and identifying a relational view of their experiences in a given situation (Marton, 1988).

In phenomenographic research, as the participants of a study may express more than one way of experiencing a situation, it is not the individual that is the unit of analysis. Instead, the unit of research in phenomenography is considered to be a 'way of experiencing something' (Marton & Booth, 1997: 111). Thus, the research process attempts to reveal the various ways in which a particular phenomenon might be understood. By encompassing the variety of ways in which a group is capable of making sense of the world, Marton (1981) suggests that phenomenography is able to characterise the world as it appears to the 'collective mind'.

4.1.1 The Phenomenographic Research Process

There are two key objectives in the phenomenographic approach to research: firstly, to 'capture conceptualizations faithful to individuals' conceptualizations of particular phenomena'; and, secondly, to 'categorise conceptions of phenomena and explore relations amongst them' (Francis, 1993: 36).

The aims of phenomenography are distinct from a number of alternative qualitative research methodologies that seek to investigate the human experience. As can be seen in Figure 2, phenomenography is an approach to researching the variety of ways in which a phenomenon can be experienced. Phenomenography aims to present a limited number of qualitatively different categories of description that are internally related to the subjects of the process or experience being examined. These aims distinguish it not only from objectivistic epistemologies (as it adopts a non-dualist, second-order perspective), but also from other qualitative research methods that examine subjective experience, such as grounded theory and phenomenology.

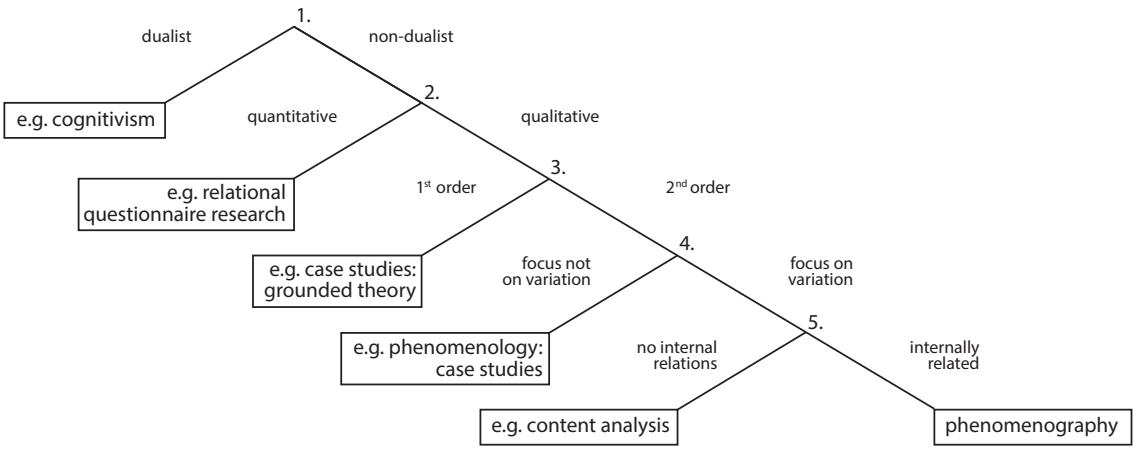

Figure 2: Phenomenography in relation to other research approaches that investigate the human experience (Trigwell, 2000)

The most popular approach to capturing conceptions of particular phenomena is through the individual interview. However, there are phenomenographic studies where group interviews, observations, drawings, written responses, historical documents, and technological or pedagogical artefacts have been used as the main sources of information (Marton, 1994). As phenomenography aims to study variation within a group of individuals, the interview sample is selected to be representative of the full range of relational views and the ways in which a phenomenon might be expected to be experienced. However, there is no expectation that the frequency of variation constituted from this sample would be reproduced throughout the sample population (Åkerlind, 2005).

By seeking to identify as wide a range of individual experiences as possible, the goal of phenomenographic research is to focus on collective, not individual, human experience (Åkerlind, 2005). As already stated, Marton (1981) has suggested that phenomenography is able to characterise the world as it appears to the 'collective mind'. In order to make good on such a suggestion, the approach that a phenomenographer follows must be carefully considered. Although the research data collected consists of descriptions of individual experiences, the analysis of this data does not emphasise the individual experience, but rather the relations between experiences within the group and, thus, the collective experience of the group as a whole (Åkerlind, 2005). However, in phenomenographic research the different ways of understanding a phenome-

non are also seen as 'inherently context-sensitive' (2005: 7). Thus, while one individual may show a tendency towards a particular way of understanding a phenomenon, this may be attributed to the circumstances from which the description of that experience arose. For instance, an experience of travelling in a vehicle would vary according to whether one was driving the vehicle or not, or if one has ever driven a vehicle, or that type of vehicle, or driven under a particular set of environmental conditions, etc. Understanding the relationship between drivers and passengers and the language used to describe this relationship is also likely to be affected by the breadth of one's travelling experience. For instance, the phrase 'back-seat driver' is likely to be affected by one's experience of driving or not, as well as by the dramatic context in which this phrase has been understood. Context-sensitive awareness, therefore, is sought because the meaning of a phenomenon can be 'constituted on the basis of (a subject's) capability for experiencing a phenomenon', while the aspects of that phenomenon that they view can arise from the context 'most relevant in their current circumstances.' (*ibid.*)

In order to avoid being distracted by what Åkerlind (2005: 8) describes as 'the endless variation inherent in the richness of individual experience', phenomenographic research aims to identify the critical aspects present in one way of describing an experience that distinguish it from any other qualitatively different ways of describing that experience. Marton and Booth have proposed the following criteria for reducing the interviewees' descriptions into differing categories:

> (i) each category tells us something distinct about a particular way of experiencing the phenomenon;
>
> (ii) the categories have to stand in a logical relationship with one another and can be hierarchically arranged; and
>
> (iii) as few categories should be explicated as is feasible and reasonable, for capturing the critical variation in the data.
>
> (Marton & Booth, 1997: 125)

In phenomenography, the term 'outcome space' is used to describe the page onto which the categories of description are organised. The outcome space (or space of variation) aims to provide researchers with an instrument for

characterising – in qualitative terms – how, for example, a text is approached, learning is experienced, or a phenomenon is understood (Marton, 1994). It usually takes the form of a table or the organisation of interview extracts. The presentation of outcome space aims to reveal a holistic view of a phenomenon, where critical aspects of meanings and the logical relationship between different meanings can be appreciated together.

The underlying rationale behind this approach is that the participants of a study are most likely to be aware of the different aspects of a phenomenon to varying degrees, rather than aware of all aspects of a phenomenon simultaneously (it is not simply a case of whether or not participants are aware of each aspect of a phenomenon, but the degree to which it enters their awareness). Marton views 'awareness as a person's total experience of the world at a given point in time' (Marton, 1994: 4427). Also, following Gurwitsch (1964), instead of viewing awareness in terms of binary relations such as aware/unaware or conscious/subconscious, Marton characterises awareness as 'an infinitely differentiated figure–ground structure' (Marton, 1994: 4427). As such, the aspects of a phenomenon in the foreground of a participant's awareness are considered to be thematised, while unthematised aspects are considered to be in the background or margins of their awareness. The point is that no dichotomy exists between two aspects of a phenomenon; instead, there is more or less continuous variation. (*ibid.*) To illustrate this, Marton uses the example of problem solving within the context of mathematics:

> When we are dealing with a mathematical problem, we are presumably aware of the quantities involved, the relations between them and the operations we may need to carry out. More vaguely, we are presumably aware of different parts of mathematics in general; it is through our previous mathematical experience that we make sense of the problem. (*ibid.*)

Marton argues that, by viewing 'partially differing fragments of the same whole' together, 'the whole pattern emerges' (Marton *et al.*, 1994a: 459). On this basis, conceptions that emerge during the process of data analysis are not considered as being constituted independently, but are considered as being in relation to one another (Åkerlind, 2005); each meaning is regarded as a fragment of the phenomenal whole, with 'the meaning of one bit derived from

the meaning of and lending meaning to the rest' (Marton & Booth, 1997: 124). This leads to the expectation that the different ways of experiencing a phenomenon would be logically 'related through the phenomenon being experienced and through the inherently (i.e. physiological and socially) related nature of human experience' (Åkerlind, 2005: 7).

A further aim of the outcome space, therefore, is to present a more or less complete, as opposed to a fragmented and unrelated, understanding of the phenomenon. The outcome space can, therefore, be used to study the variation that exists between the participant's experience of a phenomenon and across an individual participant's conception of a phenomenon. Thus, Marton and Pang (1999) propose that there are two faces of variation to be studied within phenomenographic research:

1. The first face studies variation between the ways participants of a study experience a process. This face examines the critical, qualitative differences between each category of description presented in the outcome space.
2. The second face studies variation corresponding to the relative aspects of a particular conception of a phenomenon. This face examines the relationship within a particular category of description, between the various aspects of that category and their relation within the figure–ground structure of the participant's awareness – or what is, in phenomenography, referred to as the 'dimensions of variation' within the structure of awareness.

(Marton & Booth, 1997; Marton & Pong, 2005; Cope, 2004)

Therefore, as well as identifying and organising the descriptions of a phenomenon into categories that are faithful to the participant's experience of a phenomenon, phenomenographic research seeks to study the relationship between what is referred to in the descriptions of a phenomenon and how this occurs in relation to the participant's environment. Marton and Booth classify these as the referential aspect of experience and the structural aspect of experience; the referential aspect is defined as 'anything delimited and attended to by subjects' and the structural aspect is defined as 'the combination of features dis-

cerned and focused upon by the subject' (Marton & Pong, 2005: 336). These two aspects constitute, according to Marton and Booth (1997), ways in which the 'qualitative differences' between phenomena can be distinguished. For example, the meaning ostensible in an x-ray image will involve what aspect of the image is being apprehended (e.g. any addition or absence evident in the bodily forms represented in the image), combined with the knowledge of whether or not the image relates to an aspect of the viewer's anatomy (the structure constituting how meaning is being apprehended). Thus:

> The structural changes cannot come about without the changes in meaning. Nor can changes in meaning come about without changes in structure. The structural and the referential aspects thus dialectically constitute each other. Neither is prior to the other.
>
> (Marton, 1994: 4426)

Marton and Booth (1997) refer to phenomenography's analytical framework as the 'structure of awareness'. They outline a framework for analysing a way of experiencing phenomena that comprises 'a structural and referential aspect, with the former being analyzable into internal and external horizons' (Marton & Booth, 1997: 111). The structure of awareness, which is the focus of the 'second face' of phenomenographic research, explores the variation between participants' internal and external horizons of perception. Here, phenomenography appropriates terms originally used by Husserl. Smith (2009) offers a brief summary of Husserl's terms: 'the internal horizon of an experience includes those aspects of the object (rear aspect and insides) that are co-given. The external horizon includes those objects *other* than those presented that are co-given as part of the surrounding environment'. To illustrate their understanding of Husserl's terms, Marton and Booth provide the example of coming across a deer in a wood:

> … the external horizon of coming on the deer in the woods extends from the immediate boundary of the experience – the dark forest against which the deer is discerned – through all other contexts in which related occurrences have been experienced (e.g. walks in the forest, deer in the zoo, nursery tales, reports of hunting incidents, etc.). The internal horizon comprises the deer itself, its parts, its stance, its structural presence. (Marton & Booth, 1997: 87)

Although they emphasise these structural aspects of experience in order to elucidate the relationship between the parts of a phenomenon, they do not dwell too heavily on the sense of Husserl's terms. Marton and Booth (1997) accept that, in phenomenography, they will be used somewhat differently. Phenomenographers often use these concepts as a framework to discern between the various themes within the description (internal horizon) from the context in which the description sits, the thematic field, or margin (external horizon).

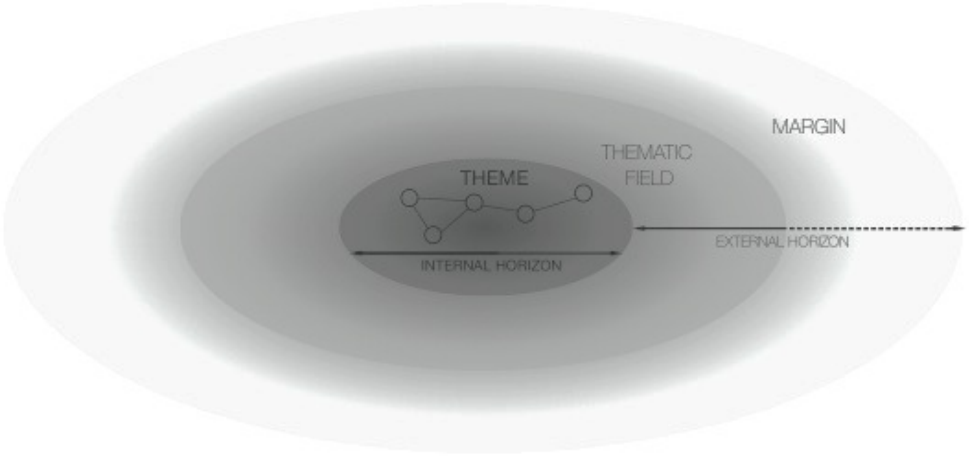

Figure 3: The structure of awareness (Booth, 1992)

To illustrate the relationships between the internal and external horizons of perception that are shown in the diagram above, Reed (2006) uses the example of coming across a motorcar engine on a scrapheap:

> The external horizon of seeing the engine in the scrap-yard extends from the immediate boundary of the experience (the engine sitting amongst the pile of scrap) through all other contexts where engines have been encountered before that moment. (Reed, 2006: 4)

Here, what is apprehended on the internal horizon occurs within the subject's environment. Conversely, what is apprehended along the external horizon consists of the subject's understanding of the phenomena constituted by past experiences and themes beyond the subject's immediate environment.

As well as acting as an analytical framework, Marton and Booth's 'structure of awareness' can also be used as a guide across the research process, informing the development of interview questions, data analysis, and the presentation of results (Cope, 2004). Overall, as a framework employed in the

analysis of the emerging categories of description and their critical aspects, the structural distinction between internal and external horizons of perception makes an important contribution to the second face of phenomenographic research which, as outlined above, is to 'categorise conceptions of phenomena and explore relations amongst them' (Francis, 1993: 36).

4.1.2 Validity and Reliability in Phenomenographic Research

While much has been written to ensure validity and reliability within the phenomenographic approach, the methodology is not entirely without contention (Cope, 2004; Kelly, 2002). The two main areas of controversy lie in: a) interviewees' descriptions of their experiences; and b) researchers' methods for data collection and analysis. A valid approach to phenomenographic research should ensure the data collection, in particular the interview procedure and subsequent analysis, measures what is intended to be measured and does so from a position of reliability. Hence the following questions might be asked: can the research findings be trusted? Or, to what extent are the results of the study or measurement repeatable in different circumstances (Bryman, 2001)? There have been many theoretical arguments presented in phenomenographic literature that attempt to address the issues obscuring the validity and reliability of research data and its analysis. However, there still appears to be no defining resolution to these issues (Cope, 2004), or even agreement over what issues to prioritise (Kelly, 2002).

When evaluating the various arguments regarding validity and reliability in phenomenographic research, Marton (1994) observes that questions are often asked that imply the researcher is engaged in 'a kind of measurement procedure' and, as such, if the same process were repeated would it lead to the same results. In his evaluation of the reliability issue, Marton makes an important distinction between measurement and analysis. He states that the process of analysis that the researcher engages with is 'not a measurement but a discovery procedure' (1994: 4429). He argues that 'finding out the different ways in which a phenomenon can be experienced is as much a discovery as the finding of some new plants on a distant island' (*ibid.*). He argues that 'the discovery does not have to be replicable'; instead, the key concern is that, once the

discovery has been made and the outcome space of a phenomenon has been revealed, other researchers should recognise what is presented in the outcome space. The categories of description should be stable enough to correspond accurately with the phenomenon under investigation. In other words, it should be possible to reach a high degree of intersubjective agreement between researchers concerning the presence or absence of the various categories (Marton, 1986). As such, if there is intersubjective agreement, the various conceptions are more likely to be of use to other researchers (Marton, 1986).

In the past, the term 'interjudge reliability' has also been used to describe the agreement or consensus attained among researchers. Interjudge reliability indicates the degree to which 'the categories of description are stable and correspond accurately to the objective reality under investigation' (Sanderberg, 1997: 207). A focus upon interjudge reliability in phenomenographic research has been described by Säljö (1988: 45) as a way of testing 'the communicability of categories and thus gives the researcher information that someone else can see the same differences in the material as he or she has done'. However, in an attempt to distance this process from the objectivistic epistemology, from which the term 'interjudge reliability' was borrowed, Cope (2004) suggests that 'interjudge communicability' is a term more appropriate to the phenomenographic approach. He argues that this term is more reflective of the second-order perspective that phenomenography takes:

> Phenomenographic studies take a different stance on the whereabouts of knowledge and the existence of an objective world. Knowledge is considered to exist in the relation constituted between an individual and the world. Categories of description are not intended to represent an aspect of objective reality; rather, they are a researcher's analysis of variation in a group of individuals' statements about their experiences of an aspect of reality. (Cope, 2004: 7)

With regards to any judgement concerning the reliability of the categories of description, Marton (1994) states that there should be 'a reasonable degree of agreement' between two independent and competent researchers. Clarifying how a 'reasonable degree of agreement' might be judged in practice, Marton considers the expression to refer 'somewhat arbitrarily, to cases where the two researchers agree in at least 2/3 of the cases when comparing their

judgements and where they reach agreement in 2/3 of the remaining cases after discussion' (1994: 4429).

Thus, the communication and presentation of the research findings are recognised as crucial aspects for assessing the reliability of phenomenographic research. However, this is not to say that validity and reliability in phenomenographic research can be reduced to the persuasiveness of the researcher's communication. The potential to deviate from the analytical framework or obscure how the research outcomes were reached has been characterised through stories of researchers 'immersing themselves in data in dark rooms for months on end and then emerging triumphantly with a cry of "Eureka" and clutching a set of hierarchically related, critically different categories of description' (Cope, 2004: 5). To avoid losing the context in which researchers' findings were discovered while working toward the criteria of reliability, Sanderberg (1997: 211) suggests maintaining an 'interpretive awareness' that takes account of both 'the researcher's procedures in the research process, and accords with the epistemology of intentionality underlying the phenomenographic approach.' He suggests following that criteria are based on a set of guidelines, established by Ihde (1977), for the practice of phenomenological reduction. Within this context, Ihde stresses that he does not take phenomenological reduction to mean that a researcher must or can bracket all the previous experiences of the object or phenomenon under investigation. However, it does involve attempts to 'circumvent certain kinds of predefinition' (1977: 31) and also the avoidance 'of descriptions which surpass the individuals' experiences under investigation' (Sanderberg, 1997: 210). In a similar way, Booth (1992) suggests that the justification of the validity of phenomenographic research lies in the full and open account of a researcher's methods and results, as constituted by the researcher's justification for their presentation of the outcome space and the claims made from this presentation. Following this, the judgement of credibility and trustworthiness then lies with the person reading the study (Booth, 1992).

To summarise, Booth (1992) proposes that a full and open account of a researcher's methods and results involves the following: acknowledging the researcher's background and scholarly knowledge of a phenomenon; providing background to the participants in the research; justifying the interview questions and follow-up questions; acknowledging attempts not to impose a pre-

existing structure on interview data; and describing the method of data analysis used and the steps taken to verify the interpretations made in the analysis process. Finally, Booth (1992) suggests that the results should be presented in a way that 'permits informed scrutiny'.

4.2 Why Choose Phenomenography to Research the Editing Process?

Central to this enquiry is the question of where a mind editing cinema is located. The key reason for using phenomenography to approach this question is that it does not assume in advance where mental processes are located. Although there are other ways of investigating mental processes, such as situated cognition, as well as philosophical positions, such as externalism, that identify issues relevant to this investigation, phenomenography distinguishes itself from these examples on a number of accounts. These distinctions will be elaborated upon shortly, in sections 4.2.1 and 4.2.2 of this chapter. Firstly, however, it is worth looking at what difference the phenomenographic approach can make to our understanding of cognition through an example of Marton's own research.

Marton previously proposed that prior assumptions regarding what aspect of cognition contributes to our worldly activities tend to be from an outsider's perspective, or represent researchers taking an 'external view' of the research subject (Marton & Booth, 1997: 15). An example of this external view and the difference that the phenomenographic approach can make to understanding a research subject is given in the case of educational research (Marton & Säljö, 1976). Prior to the development of phenomenography, to form an understanding of student learning most studies (in educational psychology, at least) sought to correlate academic performance with certain aspects of a student's profile: innate ability, motivation, organisation, etc. This research only focused on an external view of the student and it failed to provide, according to Entwistle (1984), any understanding of what contributed to a poor student profile. It is precisely this external research perspective that phenomenography has sought to eschew. By focusing on the variety of experiences and conceptions that structure the student's learning – by approaching learning from the point of view of the learner – phenomenographic research was able to identify two

distinct forms of studentship. The first focused on learning as a task, as an external imposition composed of parts or signs unrelated to life as a whole (surface learning). The second focused on that which is signified in the learning resource, the meaning of the task and how it relates to the student and life as a whole (deep learning). This understanding of two distinct approaches to learning emerged from asking students what their learning experience is like and then analysing what learning is for them – not through any prior assumptions from the researcher about which factors contribute to success or lack of success in terms of academic performance. Since the deep and surface dimensions were first identified by Marton and Säljö (1976), they have been affirmed and elaborated upon using a variety of other research approaches (Biggs, 1987; Entwistle, 1981).

The analytical framework provided by Marton and Booth (1997: 111) is of particular relevance to an investigation into where knowledge may emerge during the editing process. The aim of this framework is to bring into focus the structural relationship between various internal and external features of cognition, as apprehended by the participants of a study. This relates to the themes of the internalist–externalist debate framed in Chapters 1 and 2. Because phenomenography is concerned with how the participants of a study relate to their environment, it is an approach to research that has similarities to 'situated cognition'. The next section in the chapter will look at the correspondence between these two research approaches. However, it is also important to observe that, despite the similarities brought about by the structural prerogative found in the internalist–externalist debate, some distinctions must be made between the terms used to describe these structural relations within in this chapter and those used the preceding chapters. After the next section in this chapter I will focus upon how these terms relate to each other.

4.2.1 Phenomenography and Situated Cognition

Chapter 1 of this research began by restating and contextualising questions posed by Clark and Chalmers in *The Extended Mind* (1998). In particular, there is the question 'where does the mind stop and the rest of the world begin?' This question can also be seen as central to much of the research carried out in the

field of cognitive science, which is sometimes referred to as 'situated cognition' or 'situated action'. Situated cognition has a broad foundation that includes psychology-based learning theories, anthropology, critical theory, and political science (Wilson & Myers, 1999). Like phenomenography, the field of situated cognition places emphasis on the study of people in their environment and, like phenomenography, it is a field that emanates from studies of learning and thinking in everyday situations. However, the contexts for research following a situated cognition orientation tend to take us beyond learning environments, moving towards a wider variety of situations and what Hutchins (1995: xiii) refers to as "cognition in the wild".

In a study of nautical navigation systems (cited in Chapter 2), Hutchins (1995) presents an archetypal example of situated cognition; it shows that, rather than being attributable to the neural activity of one individual, the cognitive processes responsible for navigating a large military cargo ship safely into harbour are distributed among several tools and individuals. He demonstrates that each person performs limited tasks within a larger, more complex intelligent activity. Marton and Booth characterise Hutchins's studies as explaining human acts 'not in terms of individuals' or several individuals' mental states, but in terms of what goes on between individuals, and between individuals and situations' (Marton & Booth, 1997: 11).

Researchers in both fields – phenomenography and situated cognition – are critical of internalism's central assumption, which holds that a subject's beliefs and experiences are entirely constituted by what goes on inside the head. In line with this, 'all psychological explanation must be framed in terms of internal representation, and [the] processes (or rules) by which these representations are manipulated and transformed' are assumed to be located in the brain (Still & Costall, 1987: 2). According to Marton and Booth (1997), it is this assumption that leads to the dogma of cognitivism, which holds that action requires and is explained through the manipulation of internal representations of an external reality. At the same time, Hutchins (1995: 284) states that: 'because society has a different architecture and different communication properties than the individual mind, it is possible that there are inter psychological functions that can never be internalized by any individual'.

However, Marton and Booth (1997) reject the epistemological foundation of both individual and social constructivism, which they consider to underlie the situated cognition orientation. Despite its attempts to the contrary, they consider individual constructivism to be a form of cognitivism in the sense that it attempts to explain our activities in the world solely in terms of an individual's mental constructs. They are also critical of the social constructivist approach for conceptualising the situation being studied from the researcher's point of view, where it is assumed that the participants of a study see the situation in the same way that the researcher does (diSessa, 1993). Hence, according to Marton and Booth, social constructivism is similar to the behaviourist position, which, they argue, does not deal with 'the inner' experience of people (although, they consider Vygotskyian psychology and approaches derived from it exceptions to this). Overall, they see that the study of cognitive processes has been characterised according to two paths: the cognitivist approach, which 'puts emphasis on explaining "the outer" (actions/behaviour) in terms of "the inner" (mental representation)'; and the Vygotskyian approach, which 'tries to explain "the inner" (consciousness) in terms of "the outer" (society)' (Marton & Booth, 1997: 12). They propose that the sources of these two approaches appear to commence from opposite sides of the borderline between 'the inner' and 'the outer' (Marton & Booth, 1997: 12). As far as Marton and Booth are concerned, the focus of these two paths imposes a dualism upon the study of cognitive processes, which ultimately leads to claims that fall short in the explanatory gap between these dual poles.

To avoid the shortcomings of dualism, Marton and Booth propose that the researcher should not 'consider person and world as being separate' and should not resort to 'hypothetical structures divorced from the world' (Marton & Booth, 1997: 13). To do this, they stress the need for serious exploration of the participant's experiences in their physical, social and cultural environment. Thus, they emphasise that what must be dealt with are the experiences of people in the world; people who are not conceived of as behaviourist actors or reduced simply to bearers of mental structures (Marton & Booth, 1997). The key point they argue is that phenomenography be distinguished from a situated cognition orientation by the former's faithful adherence and presentation of the participant's conception of experience.

4.2.2 Phenomenography and Externalism

As shown earlier in this chapter, the analytical framework provided by the pioneers of phenomenography (Marton & Booth, 1997) has been derived from Husserl's notion of internal and external horizons of perception. Framing the analysis of participants' experiences and conceptions of Husserl's horizons of perception returns us to themes within the internalist–externalist debate. Many have recognised the contribution that Husserl's work has made to this debate, but his position, as an internalist or as an externalist, remains a contentious one (Zahavi, 2004, 2008). As his thinking provides a foundation for the analytical framework that will be adopted here, one should not ignore how Husserl's position relates to the practice of phenomenography. Therefore also how, in this investigation, the question 'Where is the mind of the editor?' is being approached.

However, as much of the literature generated from the internalist–externalist debate demonstrates, especially in relation to Husserl, the goal of fixing the outcome of phenomenological thought to one position between these two poles has proven to be elusive. Some have found that because of his advocacy for transcendental idealism, Husserl falls under the internalist bracket. Furthermore, because transcendental phenomenology is viewed by some as a method that provides the subject with access to a state of 'pure consciousness' prior to their experience in the world, or an experience of the individual self, it has been considered by some to be the antithesis of externalism (Burge, 1986). Externalism includes in its analysis of cognitive processes features of the subject's environment external to the subject's brain but not necessarily external to their environment (Clark, 1997; Rowlands, 2010). In relation to Husserl's thought, then, the idea of the external horizon employed in phenomenography refers specifically to those features of a subject's experience that cannot be found within the environment, such as ideas about the past and future, or ideas about the aesthetics or function of an object and other related objects. It could be argued, therefore, that although these concepts or ideas occur externally to the environment, they occur internally as representations formed within the subject's brain during their cognitive processes. Consequently, advocates of Husserl's model of internal and external horizons might also be unwittingly

deemed to hold an internalist position. But other than contradicting the key premise of phenomenographic research, which is to recognise descriptions of both the internal and external processes that constitute the relationship between humans and their environment, or particular processes within that environment. It also neglects the argument cited in Chapter 1, which is that there is no definitive consensus as to whether Husserl was of an internalist or externalist orientation.

Any confusion over this issue might be derived from an attempt to map the schema of the internalist–externalist debate onto phenomenology. This is a move that, according to Zahavi (2008), has become commonplace in the last 15 years. He observes that literature on both sides of the internalist–externalist divide have adopted phenomenological theories to bolster their arguments. Mixing a 'foreign conceptual framework' with phenomenological theories of intentionality has resulted in an even greater variety of approaches and conceptions of these theories. Thus, according to Zahavi, it is no longer a matter of simply asking whether somebody's thought is of an internalist or an externalist orientation; instead, as a result of all the various conceptions of internalism and externalism that have emerged, the question concerning which specific kind of internalism or externalism is being argued is perhaps more revealing.

In relation to this, a number of arguments challenge previous attempts to label Husserl's thought as being straightforwardly internalist. Smith (2008), in particular, argues that it is through Husserl's notion of horizons that we come to see that either object or idea or both are recognised as partial constituents of experience. Taking into consideration the account of intentional objects, by which Husserl reveals an underlying movement to all worldly perceptions as being directed between the horizons of perception, Smith finds that unity between any object and any objective being is implicitly constituted. He cites Husserl, who says that 'All mistaken interpretations of being arise from a naïve blindness to the being-sense of co-determining horizons and to the corresponding tasks of uncovering implicit intentionality' (Husserl, 1973: 118). And in a further examination of the dimension of implicit intentionality, he finds that what he conceives of as the 'horizon of sense' lies in the very essence of experiences and that they are always constituted by and are, therefore, never external to or outside consciousness. He follows Husserl with the view that every experi-

ence points to 'a horizon – an intentional horizon of reference to potentialities of consciousness that belong to [the experience] itself' (Husserl, 1973: 82). As far as Smith is concerned, while some might understand externalism from within the context of physical realism, he does not. His disjunctive approach to externalism reconstrues the position as being directed towards the external aspect of any individual consciousness.

This might suggest that the ideas shared between phenomenography and externalism could be as fluid and as open as the relationship between phenomenology and the conceptual framework emerging from the internalist–externalist debate. However, despite the fact that both phenomenology and phenomenography share the aim of revealing the nature of human experience, phenomenography, unlike phenomenology, does not adopt a first-person perspective in its approach to research. Phenomenography does not attempt to find all the ways that an individual's lived experience can be described and stops short of trying to reveal the intentional dimension of an individual's consciousness (Marton & Booth, 1997). Consequently, phenomenography is not limited to outcomes or theories emerging from a singular perspective. While the research of the phenomenologist may be driven by the question 'How does the person experience her world?' the phenomenographer is more likely to ask 'What are the critical aspects or ways of experiencing the world that make people able to handle it in more or less efficient ways?' (1997: 117) Phenomenography, therefore, is more concerned with revealing a view of experience in more or less practical terms, or more in terms of an overall process than an individuated self:

> [The aim is] not to find a singular essence, but the variation and the architecture of this variation in terms of the different aspects that define the phenomena. The simultaneous awareness of all the critical aspects comes close to the phenomenological notion of essence, although in our case it is temporary and transitional.
>
> (Marton & Booth, 1997: 117)

To turn the outcome of phenomenographic research inside out by intellectual means, as phenomenological descriptions of the world have done throughout the internalist–externalist debate, would require a multiplicity of

turns to the variety of views encompassed by the outcome space. Conversely, the sparseness of the categories of description makes phenomenography less alien than phenomenology to the conceptual logic of internalist–externalist analysis. Perhaps this is because the outcome space – through which phenomenographers present their research findings – is more concerned with the critical aspects of experience and not the process of description. Consequently, it offers an approach to researching the editing processes compatible with features of the internalist–externalist debate, and hence the context of this enquiry's research question. However, because phenomenography seeks to reveal the dimensions of variation, its findings should not be reduced to an internal or external alternative. The either-or logic suggested by some as the outcome of the internalist–externalist debate would, consequently, not be an outcome that phenomenography seeks.

4.3 How has Phenomenography been Applied to Researching the Editing Process?

In the remaining sections of this chapter I explain the approach taken to select the research participants, the characteristics of and issues with this sample, data collection (including how the interviews were structured and the kinds of questions that were asked) and how the analysis of this interview material will be approached.

4.3.1 Research Participants

The questions of how and why participants for this study were chosen can be answered in part by aims central to the phenomenographic methodology and in part by the particular focus of this research. Phenomengraphy sets out to describe the key aspects of variation in how a group of individuals' experience of a phenomenon (Marton, 1986). Participants for this study need to be selected using a method that favors neither a purely internalist model nor a purely externalist model of mind. Whilst there is no absolute way of determining in advance how subjects might reveal this, it may be assumed that the participants relationship to technology might serve as a starting point in distinguishing a

range of ways that the editing process might be experienced. As such a purposive, stratified interview sample was developed, the strata of the research sample included; *editors* – because of their direct relationship with editing technology, *directors* – because of their indirect relationship with editing technology and *artist filmmakers* – because of their direct relationship with camera, editing and projection technology.

These strata attempted to focus the sample toward the central question under investigation, the location of the mental process involved in the editing process, without prioritising one particular approach or style of filmmaking. In other words the sample was not limited exclusively to one area, such as commercials, documentary, drama, or editing in the context of art cinema, or cinema for live performance. Neither was there an intention to identify each and every style of filmmaking within the research sample – this would have required a process of categorization beyond the scope of this project. Similarly, while knowledge of the editing process could extend to include producers, cinematographers, actors and even, as is increasingly the case, software developers, the potential for variation in such a sample would have deviated from the focus of this research. Hence the sample aimed to ensure that: a) critical examples of film form and style were included and b) there was as much variation as possible between the participants in relation to this.

Phenomenography, sees the judgment of the researcher, as opposed to specific predetermined method, as the most appropriate way to collect the 'critical cases' (Cohen et al., 2000: 103) of variation in the phenomenon under investigation. However, before a phenomenographic analysis takes place, there is no way of knowing the extent of the variation being captured during the interviews. In the course of data collection and analysis for this study, a fourth category of participant emerged, which has been termed *artist filmmakers directors* – because they described both direct and indirect relationships with camera, editing and projection technology.

In sum, interviewees were selected to represent the key positions occurring within the editing process and the various approaches to the practice according to the form and style of films the participants made. Further reflection on the characteristics the research sample in the context of cinema studies and what some might regard as issues with introducing such a variety of filmmaking

styles will be discussed after the participants have been introduced. What follows now though is a brief outline the key works or collaborators associated with the participants that were interviewed.

Editors

(E1) – David Charap
Interview Date: 15/05/13
Interview Duration: 00:58:20

Since the start of the 1990s, David Charap has edited over 50 films for television and cinema. He has worked with a number of highly acclaimed feature riatefilm directors and documentary filmmakers, including Terence Davies, Pawel Pawlikowski, Benjamin Ross and Marc Isaacs.

(E2) – Paul Dosaj
Interview Date: 07/08/13
Interview Duration: 02:49:03

Paul Dosaj is an award-winning editor, writer and producer. His approach to editing documentaries mixes a narrative development that is sensitive to the characters and subjects in each film. He is best known for *Kelly and Her Sisters* (dr. Marilyn Gaunt, 2001), which won the BAFTA Flaherty Award, the Grierson Award, and the Broadcast and RTS Best Documentary Awards. Other Grierson Award-nominated documentaries he has edited include *Class of '62: From 16 to 60* (dr. Marilyn Gaunt, 2008), *The Miraculous Tales of Mickey McGuigan* (dr. Daniel Vernon, 2013) and *My Heart Belongs to Dad* (dr. Nick Poyntz, 2007).

(E3) – Alex Fry
Interview Date: 10/03/14
Interview Duration: 01:14:24

Alex Fry is an experienced documentary editor, specialising in observational authored work. Since 2010 he has worked with director Penny Woolcock (who was also interviewed during this research). Their award-winning work together includes *From the Sea to the Land Beyond* (2012) and *One Mile Away* (2012). He is also known for his work with Elizabeth Stopford on the Grierson- and BAFTA-nominated *We Need To Talk About Dad* (2011) and the cutting-edge documentary *A Very Dangerous Doctor* (dr. Leo Reagan, 2011).

(E4) – Lisa Gunning
Interview Date: 27/11/13
Interview Duration: 01:45:43

Lisa Gunning is a film editor, director and writer. As an editor she has worked with Anthony Minghella on *Breaking and Entering* (2006), with Sam Taylor-

Wood/Johnson on *Nowhere Boy* (2009) and *Fifty Shades of Grey* (2015), with Lasse Hallström on *Salmon Fishing in the Yemen* (2011), and with Martin McDonagh on *Seven Psychopaths* (2012). She has edited commercials for Nike, Land Rover and Jonny Walker, and has directed music videos for Goldfrapp, John Lobb and John Grant.

Directors

(D1) – John Akomfrah OBE
Interview Date: 19/11/13
Interview Duration: 00:57:31

John Akomfrah is an acclaimed director and co-founder of the Black Audio Film Collective, which, according to Paul Ward (2014), produced 'some of the most challenging and experimental documentaries in Britain in the 1980s'. He made his directorial debut with *Handsworth Songs* (1986), a film that went on to win the Grierson Award for Best Documentary in 1987. At the forefront of critical debate about race, identity and post-colonial attitudes in Britain for over three decades, Akomfrah is considered to be one of this country's most thought-provoking filmmakers. He has made documentaries about Martin Luther King, Malcom X, Louis Armstrong, and Stuart Hall. Besides making work for television and cinema release, he has produced multi-layered screen installations for exhibitions at the Tate Britain, ICA, MOMA New York and the Venice Biennale. From 2001 to 2007 he served as governor of the British Film Institute, and he was governor of Film London from 2004 to 2013.

(D2) – Henrique Goldman
Interview Date: 18/10/13
Interview Duration: 00:38:43

Henrique Goldman is a multi-award-winning director. Born in São Paulo, Brazil, Goldman moved to London in 1992 and started Mango Films. His award-winning films include *Princesa* (2001), which won Best Foreign Film at the Los Angeles Outfest film festival, and *Jean Charles* (2009), which won the Best Screenplay Award at the Dinard British Film Festival and Best Direction at the LA Brazilian Film Festival.

(D3) – Penny Woolcock
Interview Date: 10/03/14
Interview Duration: 01:25:49

Penny Woolcock is an award-winning filmmaker, writer and artist. Her work includes a series of features known as the Tina trilogy – *Tina Goes Shopping* (1999), *Tina Takes a Break* (2001) and *Mischief Night* (2006). She won Best British Feature at the Edinburgh Film Festival with *One Mile Away* (2012). She has directed documentaries for Channel Four's Cutting Edge – *The Five of*

Us (2000), *The Wet House* (2002) and *Going to the Dogs* (2014) – and the BBC's Storyville – *From the Sea to the Land Beyond* (2012). She has also directed opera for stage – *Doctor Atomic* (2008) and *The Pearl Fishers* (2014) – and for film – *The Death of Klinghoffer* (2003). She also directed the grime musical *One Day* (2009). In 2015 her installation *Utopia*, made with radical set designers Block 9, revealed stories of inequality, consumerism, housing, gentrification, education, crime and social media in London at the Roundhouse.

Artist Filmmaker/Directors

(AF/D1) – Mark Aerial Waller
Interview Date: 16/10/13
Interview Duration: 01:16:15

Mark Aerial Waller is an artist filmmaker. His work integrates objects, video and live performance to question ideas related to the transmission and interpretation of culture over time. He stages surreal cinematic events that attempt to 'invent new models of intellectual bricolage' (Waller, 2011). Examples of his work include *Yoga Horror* at Tate Britain (2014), *Projection Apprentice* at Mindaugas Triennial, the 11th Baltic Triennial of International Art, CAC Vilnius, Lithuania (2012), and *Kafe Pittoresk – L'Experience du Monde Visionnaire* (with Giles Round) at the Serpentine Gallery, London.

(AF/D2) – Matt Black
Interview Date: 20/08/12
Interview Duration: 00:41:53

Matt Black is best known as a DJ, one half of electronic music duo Coldcut and co-founder of the record label Ninja Tune. Driven by a desire to break the traditional aesthetic of 'rock 'n' roll performance, Coldcut pioneered the fusion of audio and video in live shows, and developed the VJamm software and a variety of set-ups that enabled real-time audiovisual mixing and scratching. In collaboration with multimedia artists, including Hex and Hexstatic, Coldcut have been involved in producing audiovisual singles (*Natural Rhythms Trilogy*, 1998), CD-ROMs (*Global Chaos CDTV*, 1992 and *Lets Us Play*, 1998), audiovisual installations (*JAM*, 1996) and the music-making app *Ninja Jamm* (2013).

(AF/D3) – Andrew Kötting

Interview Date: 23/11/12
Interview Duration: 02:06:53

Andrew Kötting is a filmmaker and performance artist of international acclaim. He started making experimental short films at the Slade School of Art (*Klipperty Klöpp*, 1986) and at the London Film-Makers' Co-op (*Hoi-Polloi*, 1990 and *Smart Alek*, 1993). He is best known for his feature-length travelogues (*Galli-*

vant, 1996, *Swandown*, 2012 and *By Our Selves*, 2015), films that he both appears in and directs. His work also takes the form of gritty melodrama (*This Filthy Earth*, 2001 and *Ivul*, 2009), scientific collaboration (*Mapping Perception,* 2002) and mixed-media installations (*In the Wake of Deadad*, 2006 and *This Our Still Life*, 2011).

Artist Filmmakers

(AF1) – Steven Ball
Interview Date: 30/08/12
Interview Duration: 00:55:02

Steven Ball has been making films, videos, performances and installations for 35 years. Since 2003, he has been a Research Fellow at Central Saint Martin's College of Art and Design and was instrumental in developing the British Artists' Film and Video Study Collection. In most of his productions, he shoots and edits his films himself. He tends to screen them to audiences at live events, in galleries or online.

(AF2) – Max Hatler
Interview Date: 05/06/13
Interview Duration: 00:58:40

Max Hatler is best known for his animations, video installations and live 'improvised' audiovisual performances. Despite the abstract form that much of his work takes he has used it to 'create powerful political statements, eschewing the traditional constraints of narrative [and] choosing a poetics of implication over the mere construction of a discourse' (Domeneck, 2011). In 2014, he won a first-prize Visual Music Award for *A Very Large Increase in the Size, Amount, or Importance of Something Over a Very Short Period of Time* (2012). He won a Bronze Design Lion for *Amnesty International: Stop the Show (aka WAR)* (2013) at the Cannes Lions International Festival of Creativity. With *Shift* (2012) he won first prize at Premio Simona Gesmundo and Best Experimental Film at TOFUZI International Festival of Animated Films in Batumi. In 2011 he won the Special Prize at the Frankfurt Visual Music Awards for *Sync* (2010).

(AF3) – John Smith
Interview Date: 21/03/13
Interview Duration: 01:12:54

Since 1972, John Smith has been making films that playfully subvert our standard reception of the cinematic image. In 2011, LUX, the London-based artist film and video agency and distributor, produced a three-DVD boxset of his films. In 2013, Sternberg Press produced an edited monograph on his work with contributions from Ian Christie, Martin Herbert, Kathrin Meyer and Ethan de Seife. Michael O'Pary (2002: 43) describes him as 'one of the most talented filmmakers of the post-war generation'.

(AF4) – William Raban
Interview Date: 28/08/12
Interview Duration: 00:56:54

William Raban is one of the foremost British artists and experimental filmmakers of the last 40 years (Fowler, 2015). He 'was one of a group of young artists at St Martins and the London Film-Makers Co-operative, for whom film was not a narrative medium but one which extended "process" and "systems" painting and music to explore perception, time and chance procedures' (Rees, 1999: 116). But with films like *Thames Film* (1986), *A13* (1994) and *Island Race* (1995), Raban made the move towards 'city-based film poems' that blended structural film with the social focus of documentary (1999: 117).

4.3.2 Characteristics of the Sample

The critical issue with the research sample as described through the short biographies above is the range of skills and filmmaking styles expressed in the work of many of the participants. This might be seen as being in keeping with one of the central objectives of phenomenogrpahic research, which is to focus on variation in the way a phenomenon is experienced, but a departure from conventional approaches to cinema studies, which typically identify critical aspects of finished film or filmmakers style. While the aims of cinema studies vary considerably, Bordwell (1996: 382) defines the purpose of film analysis as showing 'how elements of a film function in an overall system' and the formal analysis of film content is certainly a popular goal. In the case of this research, however, the aim was not to examine the outcome of the filmmaking process but to identify critical features of the editing environment. And as such to develop a research sample that would record a broad range of views on the experience of the editing process.

The characteristics of variation in the research sample could be identified according to three main themes; skills and experience; format and audience; filmmaking styles. The first of these themes, skills and experience, are summarized in the list bellow:

- Skills – 5 freelance editors, 6 artist filmmakers, 4 freelance directors, 7 writers, 5 teachers, 8 producers, 1 archivist/curator

- Editing experience – 10 to 46 years' experience
- Gender – 12 men, 2 women
- Age range – 38 to 66 years of age
- Language – English
- Credits – 203 editing credits, 187 directing credits, 105 production credits, 92 cinematographer credits, 100 writer credits (credit source; IMDb)

This list provides a finer layer of detail than the headings under which the Research Participants are presented. As the 'Skills' section in the list above indicates, even though the roles played by the interviewees tended towards mainly editors and directors, the interviewees' knowledge was drawn from experience of other roles within editing and the entire filmmaking process. For instance, one interviewee may have had experience not only as an editor, but also as a director, writer and producer. Hence, although these roles might be viewed as concrete in professional terms, they are not the stable constructs they appear to be when the extent of an individual's skill base is taken into consideration. This was also the case for the other two themes chosen to characterize the research sample, in that many of the interviewees' expressed knowledge that was not limited to one category or another within that theme.

The range of formats that the participants presented their work in included: cinema projection, television, CD-ROM, DVD and the Internet. In relation to this, the participants described experiences of working with a variety of audiovisual media, including 8mm, 16mm, video and digital video. With many of the participants having experience, of at least two or more of these media formats. This helped in collecting the full range of views constituting the knowledge of working with different editing technologies. The participants described experiences of a range of linear and non-linear editing systems, including: Steenbeck, Avid, Final Cut and VVVV. Two of the participants also spoke about merging media systems in order to engineer unique hybrid systems of their own (i.e. hybrid video mixing hardware or using a combination 8mm and home video technologies in order to generate particular artistic outcomes). Variation within the sample also meant that it was possible to discuss the differ-

ences between editing as part of a performance with a live audience with that of and in contrast to editing in an editing suite. In terms of categorizing the participant's audiences, or the kinds of social and cultural platforms their work was exhibited on, this may not be seen as an essential component of the study, but might be inferred upon through reference to the participants' filmographies.

Finally, the kinds of filmmaking styles that the participants were able to discuss ranged from editing for documentary, docu-drama, drama, comedy, and commercials to editing abstract animations. While these genres might provide an indication of certain patterns of expectation within film culture and, by extension, expectations within a corresponding editing practice, the purpose of the interviews was not to collect data for further analysis, categorisation, or quantification of genre types. It is important to affirm also that phenomenography aims, as far as possible, not to imposed theories on research findings, or, throughout the processes of data collection and analysis (Marton, 1981). Here genre could be seen as nothing more than a theory about audience expectations and filmmaking style a theory about a director's authorial voice. In the context of selecting the research sample to allow such theories to exert undue or unchecked influence would go against principles of phenomenography; which aims to be a product of dialogue rather than a reflection of pre-existing conceptions (Kelly, 2002).

Alternatively some might see a limitation to introducing such a variety of filmmaking styles. The key point here might be that specific contexts determine the kind mental operations under examination and hence a different set of mental operations will be prioritised from one participant, or filmmaking style to the next. For instance an argument could be made that takes narrative and non-narrative filmmaking as entirely different subjects (as English is to Maths) and that the perceptual focus or concept formation of an editor who is editing for comedy, drama or for a piece of abstract animation would be directed toward an entirely different goals. However, in the case of this study such a degree of variation was not seen as a limitation; for two key reasons. Firstly, it is not assumed that the participants' conception of the editing process was based upon or reducible to one filmmaking style or another. As with the other themes characterizing this sample, the interviewees' knowledge was not

limited to one category or another within each theme. From a close look at the participants' filmographies it is possible to detect differences in styles and form, not only across the population of the sample but also within the filmographies of members of the research group. Secondly, I would argue that regardless of form or style all the participants interviewed in this study were involved in the assembly of temporal objects. Hence a key characteristic in the art of cinema; defined by Merleau-Ponty (1947) as the 'cinematographic rhythm' remains central to the investigation, while whichever aspects of cinema responsible for the expression this characteristic is left to be freely described during the interview.

While it has been impossible to bracket entirely a prior knowledge of filmmaking techniques from the process of selecting the research sample, the variety of genres and filmmaking style recorded herein is not seen as a limitation. Ultimately, as with the other themes of the research sample, a variation in filmmaking styles discussed by the interviewees was viewed as a characteristic that would potentially enrich the data collected. However to fully appreciate this potential for variation and what its limitations might be the interview data needed to be firstly collected and then analysed.

4.3.3 Data Collection

Rather than using a questionnaire or a formalised set of questions, the interviews followed a semi-structured approach. According to Marton, the point of the interview in phenomenography 'is to establish the phenomenon as experienced and to explore its different aspects jointly and as fully as possible' (Marton, 1994: 4427). The semi-structured interview approach was adopted to facilitate a dialogue in which the researcher would not restrict the interviewee to a limited set of answers or preconceived ideas. As such, dialogue can unfold freely, allowing for a verbal enquiry that uncovers ideas previously unformulated by the interviewee or reveals concepts and experiences hitherto unknown to the interviewer. At the same time, a similar structure should underlie each interview. In the case of this research, all the interviews were broken up into sections and the sequencing of the sections was meant to follow the same order for each interview. This sequence was planned as follows:

a) entry into practice
b) descriptions of practice
c) descriptions of edits
d) development of practice
e) relationship to moving image

In practice, as the dialogue of the interviews unfolded these distinct sections merged and overlapped. The general pattern, however, was fairly consistent. The opening questions focused upon relevant aspects of the participants' biographies, specifically their route into filmmaking practice and various developments within their own practice. This section looked at the context in which the participants learnt to edit and their rationale for choosing to focus on a particular skillset or approach. The next phase of the interviews focused upon specific sequences and edits in the interviewees' work and the particular context in which these techniques or tropes were learnt or developed. The final phase of the interviews involved the most direct approach to the research question, in which the editors were asked directly how it is that they relate to the medium. The focus of this discussion attempted to uncover how various mental attributes possessed by the participants, such as memory and belief, were experienced in relation to the audiovisual material. To open up this discussion, a variety of cues and questions were considered, such as 'How has your memory of the edit changed?' and 'What beliefs did you have towards this material as you worked with it?' These premeditated cues were not as effective as those that arose spontaneously in the context of a dialogue. This final phase also asked participants about the perceptual understanding that they had developed through their experience as editors or throughout the course of their filmmaking practice. An example of a question that would cue this kind of discussion would be: 'How do you know when to make a cut?' The response of the participants to such questions in this final stage was mixed, varying from single sentence answers to more elaborate explanations.

A further reason for using semi-structured interviews was to uncover, as far as possible, the 'dimensions' of the thematic ground from which the participants conceptualise their experience. This is in keeping with the aims of a 'pure' phenomenographic research approach, which is intended to uncover the

ways in which people discern something from, and relate it to, a context (Marton & Booth, 1997); in the case of this research, that included the editor's relationship to technology and the cinematic experience. Also, in keeping with the aims of 'pure' phenomenographic research, this study attempted to investigate the variety of ways in which the editing process is experienced and the breadth of awareness and conceptions that the experience encompasses. Current phenomenographic research has highlighted that a narrow breadth of awareness can be indicated by 'an implicit, taken-for-granted assumption of uniformity in that aspect of the phenomenon' (Åkerlind, 2005: 7). A semi-structured interview potentially provides the opportunity to conceptually investigate any taken-for-granted assumption of uniformity, as far as the subject of the interview will allow. However, limitations to uncovering the breadth of the participants' awareness are, in this respect, just as likely to come from the researcher's own biases, enacted through their choice of words and the way certain questions are asked.

For instance, in the literature review of this project, an awareness of cognitive processes has been discussed in relation to the concept of extension. This has been presented in a variety of contexts, including cognitive science, media studies, film theory and film practice. In some cases, extension has been used as a concept to describe a spatial relationship and, in others, as being a function of cognition. The interviews represented an opportunity to capture what awareness, if any, editors have of extension, not just as a concept but in terms of their experience of extension in relation to the editing process. But the researchers' own knowledge of this subject and biases potentially contributed to what aspects of the editing process were being focused upon, impacting the dimensions of awareness uncovered. More specifically, the questions guiding the interviews could contain a bias towards a certain internalist or externalist conception of extension. Therefore, in the planning and process of interviewing the participants, the following two points recommended by Cope (2004) were taken into consideration:

1) **Steps taken to collect unbiased data;**
2) **Development and testing of interview questions.**

1) Steps taken to collect unbiased data. The level of bias carried by the researcher is a particular concern with the phenomenographic approach (Cope, 2004); specifically, there is the question of whether the researcher's own views, expressed explicitly or implicitly within the research questions and follow-up questions, influence the participant's descriptions of the phenomenon being addressed. Although bias is generally deemed to be undesirable, the removal of all bias is probably an unlikely goal. What Husserl termed 'bracketing' is often considered to be difficult, if not impossible to achieve (Ashworth, 1997). An oft-cited solution is for researchers to only use terms introduced by the interviewee when constructing follow-up questions (Cope, 2004). In the context of this research, efforts to collect unbiased data also included choosing participants with a particular level of expertise, since they would be less likely to be affected by the researcher's bias.

The participants of this research all had established creative practices, and their level of expertise (10–46 years editing/filmmaking experience) suggested that they had views towards editing practices that were already firmly established. The terms that they used to describe the editing process tended to have been formulated over the course of and in specific relation to their practice. They tended to stem partly from an arts or film education background, but most readily from the professional context within which they worked. In this respect, the researcher's own background overlapped considerably with that of the interviewees, and dialogue during the interviews often reflected this common ground. Terms such as 'mental processes', 'information processing', 'cognitive extension' or 'affordances' were not used during the course of the interview if they were not articulated by the participant. Although some of the participants described their activities in relation to the meaning of these terms, on the whole these terms hardly arose in the editor's descriptions of the editing process.

At the start of the interviews, the participants rarely required much prompting before embarking upon a description of their practices. The number of questions asked by the researcher ranged from 5 to 31 and averaged 20 (over the course of interviews that lasted an average of 1 hour and 16 minutes.) It is likely that the participants' level of expertise contributed to this; however, the rationale behind the interviewee selection recognised that articulate partici-

pants would be suitable research subjects (for instance, many of the participants had prior experience of speaking at film screenings or similar events).

2) Development and testing of interview questions. In this study, a particular attempt was made not to presume in advance that the editing process was occurring in a specific location, but to let the editor reveal what aspects are at the foreground of their attention during their decision-making processes. Questions like 'What environmental factors contribute to the editing of a film?' or 'What are the items in the editing suite that impact the editing process?' would be leading questions, as they intimate that there are external factors that contribute to the editing process. Instead, one approach used was to reference conceptions of the editing practice made by the editor and writer Walter Murch. This was used as a device to contrast and elicit the participants' own conceptions of their practices. For instance, this quote from Murch's book *In the Blink of an Eye* (2001) was used as a cue in the interviews to avoid leading questions:

> [Sometimes the] process reaches the point where I can say, 'I didn't have anything to do with that – it just created itself.' (Murch, 2001: 50)

The intention here was to allow the participants to reveal what factors they recognised as contributing to the finished edit. Furthermore, some aspects outside of the editor's environment or their own internal processes may or may not be revealed as contributing to the process. Most importantly, it was hoped that this quote would not necessitate leading questions, and that it would instead result in an unbiased account of their experience of the editing suite.

Cope (2004) suggests that guiding questions can also be designed to reveal the breadth of a participant's awareness of a phenomenon. In particular, guiding questions can help to establish the dimensions of variation in descriptions of an experience. He suggests that these include establishing 'the existence and nature of relationships between dimensions of variation, the nature of the boundary between internal and external horizons and the meaning of the phenomenon inherent in the structure' (Cope, 2004: 10). In the case of this research, an understanding of such relations was established through follow-up questions to points made by the participants, which appeared to refer to an inner experience, or representation of a memory or the subject's imagination. For

instance, if the participants referred to such words, I would ask them to clarify what they meant by the word 'inner' or 'internal' and expand on how this aspect of their practice related to other activities they were involved with.

4.3.2 Analytical Procedure

Although there is an analytical framework provided by Marton and Booth (described earlier in this chapter), phenomenographers are not limited to a set method when analysing interview data. This is somewhat different to other qualitative research methodologies, such as content analysis or grounded theory, which follow strict and systematic methods of data analysis (Flick, 1998; Marying, 2004; Strauss & Corbin, 1994). However, in the case of this research, a procedure outlined by Dahlgren and Fallsberg (1991) acted as an initial guideline for the analysis of the interview data. This involved:

(i) familiarisation with the text of the interviews;
(ii) condensation of the statements most significantly representing the emerging concepts;
(iii) comparison of significant statements to determine differences or agreement;
(iv) grouping of similar statements into tentative categories;
(v) articulation of the essence of the similarity within each category;
(vi) finding appropriate labels for these groups or categories;
(vii) further comparison of the categories with respect to similarities and differences.

(Dahlgren and Fallsberg, 1991)

All interviews were recorded and transcribed verbatim and the qualitative data analysis software package NVivo was used to support this process of analysis. Thus, having saved the interview transcriptions onto the NVivo software, I began to highlight what appeared to be key statements, labelling them tentatively and grouping similar statements without destroying the original transcripts. I was then able to view the groups of statements on one page or view the interview transcripts with the tentative labels highlighted. Due to the quantity of interview data, this was particularly useful when carrying out steps (ii), (iii) and (iv) of the above procedure.

In practice, all seven steps described above were conducted in an iterative manner, with each step informing the next. The process of selecting significant statements and grouping similar statements into tentative categories emerged at the time of observing similarities and differences between significant statements. Particular consideration was given to ensuring that the labels for each category of description, and the significant statements that they covered, did not contradict one another and remained faithful to the participants' descriptions. NVivo's interface provided a platform for the organisation of the grouped statements following this analysis of the transcripts. As I made further comparisons between groups, developed the most appropriate labels for the categories, and contemplated the relationships between the categories, NVivo kept a record of the changes made to the organisation of the grouped statements.

In the course of the analysis, there was some experimentation with the word search function that the NVivo software provided. For instance, searches were carried out on keywords present in the literature review (such as 'external', 'extension', 'cognition'), but the frequency of these words was not as high as that of words that were more specific to the vernacular of the editing practice (such as 'find', 'join', 'sense'). So, while the word search function acted as a novel way of further exploring the interview data and exposing patterns between interview transcripts, this was not as important in the analytical procedure as identifying and grouping key statements. NVivo also offers a multitude of additional functions, such as visualisation tools and pattern-based auto coding; however, these were not deemed to be relevant to the research procedure and, in particular, phenomenography's analytical framework.

As elaborated upon earlier in this chapter, there are two aspects provided in Marton and Booth's analytical framework (1997), namely a referential aspect and a structural aspect. Marton has defined the referential aspect as 'anything delimited and attended to by subjects' and the structural aspect as 'the combination of features discerned and focused upon by the subject' (Marton & Pong, 2005: 336). Cope (2004) suggests two generic questions that can be used to reveal the internal and external horizons in a description of a phenomenon. He suggests that the external horizon can be contemplated through a question like, 'How must the phenomenon be delimited from its context if this quote is to

make sense?' In this research, ideas that were outside of the interviewee's immediate environment but related to a particular category of description were indicative aspects of a quote's external horizon. In contemplating the internal horizon, Cope (2004) suggests a question like 'What dimension(s) of variation must be discerned if the quote is to make sense?' In this research, the features of a category of description's internal horizon were discerned in relation to the referential aspects of that category. Although not every theme present in the category was present within the editing environment, these themes were clearly present in the interview data. It was, however, harder to ascertain the presence of a thematic field or the margins of that category of description and the participant's awareness without the presence of the participant (i.e. from the interview data alone).

Another issue that arose during the analysis of the interview data was discerning what stage in the filmmaking process the interviewee's description of a particular editing activity referred to. There are a variety stages within filmmaking where editing processes might be recognised. How these stages are recognised and how distinctive these stages are to the interviewees, might influence their responses to the question 'Where does the editing process occur?' For instance, Vertov (1984: 72) discerned six stages of editing within the filmmaking process (see Chapter 3). Typically, however, within a commercial filmmaking practice the process is broken down into three discrete stages: pre-production, production and post-production. Editing is usually considered to take place during post-production, and post-production is considered to take place within the cutting room or editing suite. However, in the process of analysing the interviews, the participants' responses revealed that there are various ways of understanding the editing process that are not necessarily confined to the post-production stage. Therefore, an important factor in understanding *where* the editing process occurs is in establishing *when* it occurs (or in establishing the relationship between the various stages in a production when the editing process occurs).

For the purposes of this investigation, the stages in a production were simply termed *pre-edit* and *in-edit*. These two terms acted as sufficient markers to separate descriptions of the preconceptions and preparations involved prior to the edit (pre-edit) from the kinds of activities that occur during an edit (in-edit).

Also, as discussed earlier in this chapter, there is the issue of reliability in phenomenographic research. In particular, the level of agreement between two researchers concerning the presence or absence of the various categories has been stated to be an important criterion of reliability in phenomenographic research (Marton, 1986). If a 'high level of agreement between two researchers is achieved, it is more likely that the research will be of use to other researchers.' (Marton, 1986: 35). Therefore, during the course of data analysis of the interview transcripts, NVivo project and research findings were given to an independent researcher to study.

This researcher was Janet Blatter, an independent cognitive scientist (PhD McGill University) whose research centres on visual-spatial-temporal reasoning. Her work follows in the tradition of Hutchins (who is cited in Chapters 2 and 4 of the study), a cognitive anthropologist and pioneer of the distributed cognition paradigm, but is focused on design-based problem solving in the context of time-based media and sequential arts. Blatter has conducted studies employing activity theory, which focuses on how internal and external aspects of cognition connect (Blatter, 2007). Activity theory is partially derived from the work of Vygotsky (also cited in Chapters 2 and 4 of the study) and corresponds closely to the theory of situated cognition. As described in the 'Phenomenography and Situated Cognition' section of this chapter, there are similarities and differences between these methodologies, specifically in their approach towards studying cognitive environments. These points supported the case for collaborating with Blatter during the analytical process. Most importantly, however, Blatter's studies have been conducted in the actual context where artists and designers working with time-based media conduct their practices and engage with their relevant cognitive processes.

A total of two versions of the categories of description and the outcome space were shown to Blatter. With each version, the labelling of categories of description was scrutinised for suitability against the choice of quotes that accompanied them. It was found that two thirds of the categories of description were agreed upon and, following further discussion, a reasonable level of agreement was found towards the remaining cases. The various iterations of this process led to improvements in the quality and suitability of the categories of description. Overall, this procedure focused the researcher's efforts to organ-

ise and communicate the research findings in a manner that was faithful to the participants' conceptions of the editing process and that corresponded to the analytical framework provided by the pioneers of the phenomenographic approach.

Finally, with regards to the presentation of the research findings, although there is no prescribed format for how phenomenographic research is to be presented, Booth (1992) suggests that research findings be presented in a manner that permits informed scrutiny. Cope (2004: 12) also argues that the 'structure of awareness can be used to underlie the presentation of a set of categories of description'. In this research, the analysis of the interview data was repeated over a number of iterative phases (encompassed by the steps outlined above). Following each iterative phase of progression, the presentation of the research findings became more informed by the research methodology and, most importantly, by an improved cognizance of the interview data. In total, four phases of analysis were carried out and these are documented within the NVivo project file. The final version of this analysis is presented as a phenomenographic outcome space within the next chapter.

Chapter 5

Research Findings

5. Introduction

The way the world is revealed through cinema (according to the ideas reviewed in earlier chapters of this study) has been shown to have a particularly interesting relationship with the philosophy of mind. David Chalmers, for instance, characterises our subjective experience of the mind and world as 'the movie playing inside your head'; he also relates this movie analogy to the experience of the mind as a stream of consciousness (Chalmers, 2014). There is nothing particularly new in this, and Chapter 3 demonstrates that the similarities between subjective awareness and what cinema presents, has already been acknowledged and challenged by key filmmakers, philosophers and psychologists. In explanations of cinema's verisimilitude to our subjective outlook, a considerable amount of credence has been attributed to the editing process (Münsterberg, 1916; Eisenstein, 1949; Merleau-Ponty, 1964). While these analyses predominantly reflect on the audience's experience of edited films, in the context of everyday life some philosophers like to characterise our mental experience as being the result of 'editorial processes' occurring within the brain (Dennett, 1991). However, accounts of the editing process from the perspective of those who are intimately involved in the practice are often overlooked. It seems only reasonable, therefore, to speak to editors themselves about how they are able to constitute the worlds we experience on the cinematic screen.

At the same time, it is not assumed that every editor intends or knows how to effectively sequence unedited material in a way that spectators will recognise as a subjective outlook. The editing process is capable of producing a point of view on many aspects of experience – towards people, places, technology, and even the process of editing itself. That these views are constituted through mental processes is not in doubt, and neither is the fact that technology enables the presentation of the cinematic experience. But what is sought in speaking to editors is an understanding of what (or who) they are engaged with and how their activities are directed towards the construction of a cinematic sequence.

The phenomenographic approach (described in the preceding chapter) provides a framework for analysing the interview data in a way that is grounded in methodological rigour but does not assume in advance where the cognitive features involved in the editing process are located. Phenomenography does, however, propose that the features of a process referred to in interviews have certain internal or external attributes and the analytical framework that phenomenography provides draws upon this. As such, it is considered to be a particularly suitable approach for evaluating which features of the interview data, if any, relate to the extended mind model of cognition, and which challenge the notion that mental processes are constituted exclusively by neural processes occurring within the brain.

In keeping with a phenomenographic approach to the layout of research findings and the principles of analysis underlying the phenomenographic 'outcome space' (Marton, 1981), the interviews and their analysis will be presented in the following sequence:

- **Categories of description** – each category refers to a qualitatively distinct way of understanding the editing process. They seek to represent the lowest number of critical aspects that can describe the process (Marton & Booth, 1997).
- **Structure of the variation within categories** – this section indicates the 'dimensions of variation' between the themes discussed within each category (Marton & Booth, 1997).
- **Structure of the variation between categories** – this section delineates the active relationship between the categories (Marton & Booth, 1997).

The first section in this sequence will provide a more detailed description of each category accompanied by a suitable quote from the interview data. Further evidence for the suitability of each category's labelling will be revealed through an analysis of the structure of the variation within categories, as well as the structure of the variation between categories. These latter two sections will provide the opportunity to present interview extracts suited to explaining the variation between internal and external aspects of the editing environment.

As well as following a conventional phenomenographic approach to the layout of the research findings, two further sections have been considered nec-

essary. One involves a section of individual vignettes, which will give an indication of how the relationship between the categories of description is presented within the individual cases of selected participants; this will be followed by a section summarising the roles played by editors, directors and artist filmmakers. Although deviating slightly from the way the outcome space is usually presented in phenomenographic research, overall these sections were considered necessary because they provide a more context-sensitive platform from which to analyse these particular aspects of the interview data.

In the closing section, I will reflect on the patterns of variation identified in the research findings and discuss how these relate to Marton's notion of the 'collective mind' (1981). This will return us, in the chapter's conclusion, to a discussion on how the notion of cognitive extension and the problem of mental location relate to the processes described in the interview data. Thus, what is revealed in the research findings will be reviewed specifically in light of what has been outlined in earlier chapters through the extended mind model of cognition.

5.1 Categories of Description

From the interviews and the analytical procedure (explained in the preceding chapter), the following five 'categories of description' emerged. They represent five critical aspects of the editing process that 14 interview subjects described. They are:

A. The technological parameters that editors work within (technological parameters).
B. The features of interaction that editors experience when working with the editing technology (user interaction).
C. The specific approaches that the editor adopts in order to organise the editing material (metacognitive focus).
D. The ideas used to describe the editing material and their relation to the construction of the cinematic experience (aesthetic/narrative explanations).
E. The issues that the expectations and experiences of audiences bring to the editing process (cultural and sociological parameters).

The pattern in which these categories are organised is not reflective of any chronological ordering of the editing process, and nor is it hierarchical (in the sense that some categories are deemed to be more potent than others). Rather, the focus of the categories appears to move from principally external aspects (editing technology) towards internally driven aspects (editing strategies) and then back to aspects of the process that are located externally to the editor (expectations and experiences of audiences). Between these, the focus of the categories arises from descriptions that appear to be both internally and externally constituted.

One should also emphasise that the main principle ordering the arrangement of these categories of description is referred to in phenomenographic terms as the 'structure of awareness' (Marton & Booth, 1997). The presentation of the research findings also conveys an expansion of the participants' 'breadth of awareness' (Åkerlind, 2005), moving down the list, as the dimensions of variation within the categories of description increase. In other words there is increasing complexity with descriptions in the later categories; these descriptions tend to encompass relations that, either implicitly or explicitly, extend beyond the physical boundaries of the editing suit.

What follows now is an overview of the themes discussed by the participants, which leads to the classification of each category of description. Each category is supported by a selection of quotes that are illustrative of these themes.

5.1 A – The technological parameters that editors work within

This category emerged from descriptions of the editing process that show the editor's awareness of what the technology being used does. The descriptions are directed towards the various functions of the editing technology; this could be something as simple as cutting between frames:

> With cutting films, you've got to allow for cutting frames for each splice, for the neg. cutter to work properly. I mean, you cut a film and then you need to go back and check it against all your original logging notes to make sure that, at every cut, you have left at least one frame as a cutting frame. Because if you don't do that it doesn't work on an overlap join that the neg. cutter has to use. (AF4)

or, as the quote bellow shows, functions that enable the user to manipulate the screen image:

> So this software opens up a universe of parameters, which I can then operate within, but in real time, using graphic shapes I can change speed, direction, position, mirroring. I can run it through filters; I can use digital video feedback – different things to alter the image and to control the performance. (AF2)

5.1 B – The features of interaction that editors experience when working with the editing technology

While the previous category expressed knowledge of the equipment's functions, this category expresses the different qualities of the experience that an editor has when interacting with the equipment, or what affordances are found by a particular editor and the equipment they use. These are encompassed by various haptic, spatial, procedural and durational experiences that have been described during the editing process. For instance:

> In the 70s, in most cutting suites you would do most of your editing on that machine, just winding your film from reels to edit bags either side of the machine. And you'd have a Steenbeck in the cutting room. You'd look at things on the Steenbeck and then the actual editing would happen on this very tactile machine, I mean they had a motor on them, but very often you would just turn them by hand, going backwards and forwards, looking at your cut again and again. Then when you thought that you had got it right, then you'd look at it on the Steenbeck, where you would look at an extended period of the film. On the hand-wound editing machine you couldn't look at more than about 30 seconds without getting completely tangled up in the bins, you know. But it made an enormous difference actually. (AF3)

The different levels of interaction that occur within the editing suit are indicated below:

> Because the operator of the editing machine has a direct relationship with the material and because he is playing backwards and forwards; just by controlling the technology there is a relationship that is set up

> that is different from somebody who is just watching somebody control the image. (AF/D1)

5.1 C – The specific approaches that the editor adopts in order to organise the editing material

The descriptions of the editing process in this category refer to the way an editor perceives or plans the editing process. While the previous category focused on user interaction with the editing technology, this category presents us with the ways in which the editor thinks about their thinking and correlates this with the kind of thinking that the editing technology facilitates.

> So you tend to work in sections. You think "I like that, I want to work with that bit, I've always liked that sequence" and then that informs and inspires you to another series of editing decisions. I think it's an extension of the way in which the mind works, I think since things have gone digital you can be so much more immediate, it's like the synapse is squirting these ideas across the cortex and you can get into that frenzy… It's all so quick and possible. (AF/D3)

> I think I edit in a linear way, too. Even the films that I've cut non-linear are edited in a linear way, to my way of thinking… I think working with film, and I am specifically talking about analogue and cutting on a Steenbeck, it is a lineal process. (AF4)

5.1 D – The ideas used to describe the editing material and their relation to the construction of the cinematic experience

The focus in this category is on building a cinematic experience from an understanding of the editing material. Hence, it reveals the aspects of the editing process that are directed towards telling a believable story, or involve the distillation of the material into an aesthetic experience.

> I always try and see the material first and then work from there and cut from inside it rather than on top of it… If I respond to something I respond to it… Everything is as simple as it can humanly possibly be because I just want to concentrate on the story, to get through the technology, which I am not very good at, and get into the story and just float around it as much as I can. Just to use this as a tool that is very, very simple. (E4)

By attempting to see beyond the complexity of the editing technology or the type of thinking that it facilitates, descriptions in this category often present the editing process as being like something else, or even as occurring somewhere else. In this category, metaphors act as a useful means of explaining what the editor (or director) desires in the editing process:

> Well, I think it's a bit like laying a fire. You get all the wood together, you know, and the newspaper and the matches and it's like "Is this going to catch?" And then at a certain point you are just feeding it, you're just feeding the fire and it just builds and it tells you what to do. Those are the best ones… at a certain point you turn a corner with it and you feel like you are in that world and all you have to do is remain faithful to it and it will lead you to the finish line. (E3)

5.1 E – The issues that the expectations and experiences of audiences bring to the editing process

This category recognises a broad array of factors that extend beyond the editing suite, such as the conventions of a genre (cultural considerations) and forms of commercial regulation (collaborative/social considerations). In this category, the expectations and experiences of an audience, imagined or actual, are recognised as having an impact on the decisions being made in the editing suite. While the previous three categories focused on the agency of the editor during the editing process, this category describes the aspects influencing the decision making of the editing process that are outside of the editor's control. Factors in this category might incorporate decisions brought in by producers or executives; however, the motive behind these decisions appears to be socially and culturally constituted rather than attributable to one particular individual (for instance, what have become culturally or socially constructed models of understanding derived from conventionalised approaches to narration or comprehension):

> Well, you know that is like the endless tension between filmmakers and executives from channels or production companies. There is always a battle over the expected level of comprehension of the audience. That is the battleground of most documentaries, how much do we need to tell them and in what order. So those conventions like captioning people,

> like voice-over, in a way those are the elements of the battle and how you allow the audience to come to the film. (E3)

There are also cases where aspects of commercialisation and advances in technology drive how the profession is organised. As can be seen from the extract below, this has a clear impact on who makes decisions and how decisions are made:

> Yes, there has been a very interesting development now, I think partly because of all those rig shows, you know like *24 Hours in A&E* and so on, where there are just cameras shooting the hell out of everything. And then you have these producers who select and it is all very formulaic. Or all the factual entertainment shows that grew out of *Wife Swap* and *Faking It* and *Super Nanny* and *Come Dine With Me* or whatever, all these things, or even recently *Benefit Street* which caused such a furore. There is no director anymore, so you have shooting APs or PDs or whatever they call them, so you have lots of young people out there with little cameras and they just shoot everything and then in the cutting room you have somebody called the "edit producer" and the "edit producer" [who] makes all the decisions and tries to shape all this amorphous material into episodes. (D3)

5.2 Structure of the Variation Within Categories

Having established what each category of description refers to, what now follows are examples from these categories that emerge at two key stages of the editing process. The various stages of a production (from pre-production to post-production) that relate to editing are discussed in Chapters 3 and 4. To simplify the presentation of the research findings, these stages have been termed *pre-edit* and *in-edit*. These two stages are sufficient to compare processes or preconceptions, which emerge before the editing suite is entered (*pre-edit*) to the kinds of activities that occur within the editing suite (*in-edit*). The following extracts give a view of the same category of description as it varies across these two key stages of the editing process.

5.2 A – The technological parameters that editors work within

The variation in the structure of this category occurs between the technological functions of the editing equipment (but also to other relevant pieces of equipment).

Pre-edit:

> Well, of course everything has to be made for a 16mm negative to produce a 16mm negative as to what you want in the end cut. So it has a massive influence, especially working with analogue film all the way through, it imposes an essential discipline on how you work and organise yourself. (AF4)

> In some cases one might make the decision to make something that wasn't edited at all in terms of the physicality, the physical film being cut, one might do all the editing in camera. (AF1)

The above example demonstrates how decisions, constrained by features of the technology, are made before the work in the cutting room begins. However, there are also technological constraints that the editor is confronted with while editing:

In-edit:

> You can only use one shot once, any text with the image has to be shot on a rostrum camera, that sort of thing. (AF4)

For some of the artist filmmakers who edit there own films these technological constraints (size of frame, quality of image) are celebrated:

In-edit:

> So in a way it is a similar approach, saying these are my parameters I'll see what I can do by improvising, but not improvising or excavating over weeks to produce a very polished end result, but actually doing it in the moment and it happens in the moment and once it's over it's gone. (AF2)

5.2 B – The features of interaction that editors experience when working with the editing technology

This category finds variation in the editors' interactions with the editing technology and how they apprehend this aspect of the experience. There were only a few examples of editors having preconceived ideas about what the experience of operating a new type of editing equipment would be like (due, in this case, to the shift from analogue to digital).

Pre-edit:

> I dreaded it, I mean, I edited on a Steenbeck until the last possible moment really. So I never edited a film on a computer and even when I started working with video I sort of dreaded the fact that I was going to start editing on a computer. (AF3)

Based on this quote alone, there is the suggestion that the technology is a habit-forming experience for the user. This is something that, in this case at least, points towards the internal horizon of the user. Unfortunately, other than a personal postulation that leaving one way of working and starting a new way of working was an experience to dread, there is not enough evidence to substantiate what this one quote suggests. The only other themes related to the editor's dread are revealed later in this passage, when the editor describes his interaction with the digital editing technology.

In-edit (haptic):

> I was actually really surprised by how quickly I took to it. And it did feel a bit like a tactile experience. I had thought I was going to feel so removed, but if I am editing on Final Cut I am using the razor blade, dragging and dropping things around, and when I am looking at things on the timeline, it's pretty much the same as looking at a piece of film. (AF3)

Here, the absence of a tactile experience that the editor had feared does not turn out to be as problematic as he thought it would be, suggesting that this editor only had a surface attachment to the tactile quality of working with celluloid.

A number of other subcategories were also delineated within this category (including haptic, spatial, procedural and durational themes). In the example below, an experience of echolalia is described in relation to a combination of procedural and durational themes of user interaction.

In-edit (procedural and durational):

> Now that we've gone digital, now that you can look at a section again and again and again and the looping and the voices, quite often I hear voices from my films… it's a form of echolalia, when you're hearing the same thing again and again and again, because you've been running it again and again. On a Steenbeck you never used to work in that kind of

> way. By the time you go to the assistant to hang up and you go to ask for it back, your mind isn't processing the sound and image as quickly and you can go straight back to the timeline; you can go up and down the timeline and you know where the images are and you know where the sound that belongs to the image is that you're after. So all that stuff, you're taking it in, you're drinking it, we didn't do it that rapidly for sure, we didn't do it that quickly. (AF/D 3)

5.2 C – The specific approaches that the editor adopts in order to organise the editing material

This category finds variation in issues around the ordering of the editors' thoughts, specifically because of their awareness of how knowledge is constituted during the editing process. One recurring theme (see 5.1 C – AF4) involves the expression and ordering of an editor's thinking in terms of a linear stream.

Pre-edit:

> I almost have a visual image in my head of a film, and its shape, and because sound is an important part as well, it's a bit like two timelines, one with image and one with sound, and the way in which they kind of complement each other, running along parallel, or one runs on the surface and one drops down, in terms of whether sound is dominant or whether image is dominant. (AF3)

This reflects a certain internal relationship that the editor has to the form of the film that they are working on (or perception that is directed towards an external horizon). According to the kinds of tools or strategies that the editor adopts, this internal picture of the film's form can be transformed into an external relationship between the editor and their environment. In the following extract, the description of a system, involving the organisation of pertinent shot data onto cards and the arrangement of these cards in space, provides us with an example of this transformation or externalisation.

In-edit:

> Each scene gets one of these as it is shot. So, as it comes in the cutting room, I have got these washing lines and we kind of peg them up and as the film comes in you can kind of see how much of the end of the film you've got, how much of the beginning and how much in the middle. Whether the scenes are beginning to join up or not. And where you can

> concentrate on stuff and it's amazing because computers just don't do that. This is just a really simple way of seeing what you've got and you just don't really know what you've got unless you can see it all in one go. (E4)

This extract demonstrates a metacognitive solution to something that 'computers just don't do' (namely, provide a physical space that is large enough to perceive the entire timeline of a feature film and allow for the embodied experience of moving parts of this timeline around in space). The 'washing line' solution above describes a way of thinking about the ordering of sequences in a film that allows for information to be processed through the re-organisation of objects within the editing suite, the editor's internal horizon. It is another example of information processing occurring externally to the editor but within the editor's environment.

5.2 D – The ideas used to describe the editing material and their relation to the construction of the cinematic experience

Variation in this category occurs on two accounts: by identification of themes along the external horizon (from the purpose of the cinematic experience to qualitative aspects sought in the editing material); and by experiential themes that delimit the formation and assembly of this editing material. What is described here, then, is the search for the key elements of the story and thus for themes that would contribute towards the narration of a story; but it also simultaneously describes what the experience of looking for and building a story is. Identifying these internal themes is often the work of the director, as the following extract demonstrates.

Pre-edit:

> I mean, with the editor I would always just say to them: "look, we just got to remember three things, about me and then the material. I am fantastically interested in the rhythm of things, the tone of things and the cadence of things. Alright, so that doesn't mean that the material that you have in front of you has those things fully fleshed out, it doesn't. But there is a register of them that I am looking for" – and

> that's why it is 60 hours rather than two hours because, if I knew exactly what it is, I'd just go (za za zahh and then!). (D1)

This category provides some rich examples of how communication between the director and the editor occurs, from what themes are identified at the start of the edit (above) to what is experienced as the process develops (below).

In-edit:

> Interviewer: Where does the thinking happen?
>
> Interviewee: Well, I'll give you two examples. There is a process that used to happen. And it sometimes happened with people who I worked with quite a lot… and I would start off being logical and clear and "oh let's do this" or "this". But about the second week into an eight-week edit that's gone… We are functioning at the level of grunts and "umms" and "ahhhs". Because you do get to a point when you realise, for good or ill, this film takes this shape because you don't have the resources for any other shape. Any other form, this is the form it's going to take. And once you've got that, that becomes, literally in mining, it becomes the lamp on your forehead that you are groping through the dark with. And the minute that you hit that glint you can tell because you have already, over the three, two, four weeks, and it depends sometimes it can take longer… but once you hit it once you can then see its outline. It is literally in your mind's eye, you can see the outline, and it still doesn't mean you know what it's going to be. But you can see its ghostly trace. (D1)

What is particularly useful about this quote is that it shows how experiences of internal themes develop in relation to an immanent, iterative process unfolding when the makers view and re-view the material they are working with. Just out of sight of the director and editor is the experience of how these internal themes will be witnessed as a whole. Consequently the metaphor of mining appears particularly appropriate in articulating the process of revelation that encompasses the editing experience:

> Mining is probably the best metaphor and metonym for it. Because it carries both the sense of the manual labour involved. You know, that metaphor of hacking away at something which will have embedded in it something of value… it is quite literally the gathering of stuff, which you know then, has to go toward something that will go somewhere. So

> mining is good because at some point you want it to, you know, burn. (D1)

5.2 E – The issues that the expectations and experiences of audiences bring to the editing process

The variation within this category occurs within the parameters of social or cultural constraints; for instance, the constraints that are imposed during the production of a commissioned film.

Pre-edit:

> [With a] commissioned film somebody comes up to you and goes "will you do this" and you go "yeah" and they go "well, how will you do this?" because that is the basis of the contract with them. And you go "oh, I am going to do it this way and you go ahead". (D1)

> [The] commissioning process tends to mean that the results of what you're supposed to come up with are what you've pitched. In other words, it's not observational, it's this is what we want, go and get it. (D1)

In the example above, variation, in terms of the way in which the film is edited, is limited by the expectations of the commissioners. Interestingly, parameters for this category were also perceived by interviewees whose work was not commissioned and away from any conventional approach to broadcast filmmaking:

> It's a home movie, that's all it is, a glorified home movie. I never had the mind-set that involved this notion of delivering a product on time for the funders or the producers or the execs… [but] there's always these exterior forces that are exerting some kind of pressure, even if your producers are really hands off. Deep down, you think, are they hands off because they're not interested in the project? (AF/D3)

During the edit, the impact of external forces varies between the filmmaker's internalised or imaginary version of an audience.

In-edit:

> When I think about a work and I am thinking about that audience and when I am saying the audience is me, I am also imagining me as somebody who has never seen an experimental film. So I want people who

> might just be turning on their TV to engage with it. But at the same time I am thinking about different levels of engagement. That's the thing. What I mean by that is, I want to make work so that everybody who is relatively open-minded will get something from it, and then some people will get a lot more from it if they are interested in the same things I am interested in. (AF3)

As well as an imagined audience, there are cases where an actual audience exerts an influence on the decisions made during the editing process:

> With fiction, in my experience there is more interference. So, with *Mischief Night* the first cut that we had, which was in a little cinema, there were 25 people and you could see them all from the light of the projector. Well I didn't know who they were; the Film Council and from Film Four and I can't remember where else. And then they send you notes, quite a lot of notes. And that is, I think, incredibly unhelpful because it's just too many people all saying different things and the tyranny of that, there is a huge amount of messing about actually, more so in Hollywood, where you are constantly besieged and trying to remember what the film was about that you wanted to make and not get too dragged down by lots of competing ideas about what is going to make it better or more popular, or whatever it is that they want.
>
> With documentaries it tends to be less people, and usually the people who will be wielding a big stick will be the TV people because they get worried about scheduling and ratings and what's going to happen if you make it too thoughtful, or whatever it is they think is a problem. (D3)

5.3 Structure of the Variation Between Categories

In the following extracts, the relation between categories of description shows the editing process to comprise a number of interconnected aspects. These interrelated aspects might be experienced simultaneously during the editing process; however, it is hard to refer to all of these at the same time. The exceptions are those cases (as with the one below) where no particular aspect is referred to, but which stem from overall conceptions of what the editing process entails:

> Everything affects your decision-making process. Absolutely. It would be impossible to say that it didn't really, everything that you do as you apply it to an activity is going to have some kind of impact. I don't think editing is a cold, scientific process where you sit down and say "oh I'm

> going to do this and put this here and do this… It's a mess, usually, for me anyway". (AF1)

While the view above suggests a state of interconnection without referring to any particular aspect of the process, what follows are cases that do refer to particular aspects of the editing process and yet also manage to describe other aspects that are simultaneously present in the participant's focal awareness. The scope of these interconnected categories of description provides an indication of what is, in phenomenography, referred to as the participant's 'breadth of awareness' (Åkerlind, 2005). In being simultaneously aware of the possibilities held not only by particular themes but also between aspects, the participants demonstrate awareness toward an even greater potential for variation within the process as a whole.

5.3 A – The technological parameters that editors work within

> So you can say, well these are the parameters, so if I work with a fixed camera angle that is my decision, *and if I also have a fixed time frame where I have five weeks or so where I have to finish the piece, then that is another constraint*, but you can work with it. So you say, how can I deal with it? How do I make the most of working within that constraint? *Often, deadlines can be a very helpful contribution towards getting something done. So any kind of restriction can be helpful in producing something because if you have an unlimited amount of options available*… You see this in people's misuse of filters, as well as doing technical gimmicks just because you can**,** *you also see it in Hollywood films, which have massive budgets*… they use all kinds of trickery and it's still a shit film. So limitations are good, I think. (AF2)

Shown in italics are the themes outside of this categories technological parameters. This participant's idea of 'an unlimited amount of options' alerts us to how great the potential for variation, within this category, appears to be for him Although this participant also alludes to other (unidentified) aspects of cinema, or 'any kind of restriction', that could be considered to limit the amount of options available to the editor. These presumably would be restrictions identified and categorised by the artist himself.

5.3 B – The features of interaction that editors experience when working with the editing technology

> [With] *the old-style mechanical tape decks you had a mechanical pause***,** which was instantaneous, later on they became all electronic, soft touch bollocks control and you'd hit it and then a second later the mechanism would then clunk out, which was no use to us 'cause you'd then get a delay, and you can't really be precise. But *with the old pause button, it was like a punk version of doing razor edits on a reel-to-reel machine,* but it was an instant way. (AF/D2)

This section introduces the mechanical capabilities of the technology (Category A – italics), but its main focus is the haptic and durational qualities of the user experience (Category B). In phenomenographic terms, the dimension of variation of one category of description overlaps with that of another. This demonstrates the close relation between the technological parameters of editing equipment and the editor's experience of using the equipment.

5.3 C – The specific approaches that the editor adopts in order to organise the editing material

> I don't think it's anything to do with technology – I mean; the technology facilitates a different way of thinking. It would be inconceivable to try to cut the sort of multi-layered huge amounts of material documentaries that are now commonplace on linear technology. It's just not worth it… *it's physically cumbersome to unpick every splice and then have to reconstruct sequences from memory and so on. It's physically possible, of course it is, you can carve each frame as a woodcut and compile a film like that, but there comes a point where one's mental capacity is affected by the speed at which you can try things out* and the ability to draw on huge amounts of material and go back to look at previous versions. This is the commonplace aspect of non-linear editing. I'm old enough to remember how it didn't used to happen like that, you know, *I've cut on pneumatic video machines, and it has its advantages as well, there's a nice five-second pre-roll time before an edit took place***,** *which would drive modern editors to despair, saying "come on, let's get on with it, I want to see it now". But, it actually meant that you would roll back and you'd hear a big clunk and then you'd focus for three seconds until the image cut or the sound cut*, whatever it was, you'd really focus on the impact of an edit. It's clearly not better, but it meant that you tended to get the edits sharper and quicker, whereas in the time it takes to do one pneumatic edit you'd have done five or six edits, but you may end up with the same result. (E1)

This editor clearly points out how different types of editing technology

(tools for cutting and splicing the editing material) affect an editor's capacity to think in a particular kind of way. The perceived value of this 'mind-set' varies. In the extract below, the digital editing tools are perceived as being particularly suited to the task of editing because they produce a 'mind-set' that is more closely related to the 'processing and processes' of thought:

> [What] you're trying to tap into is an extension, is the workings of the mind manifest. There is definitely a correlation between the editing phenomena, especially digital editing, and I do think there is a difference between the analogue and digital editing; the mind-set is different. I think this is more representative or symbolic of the thought processing and processes that are at work than the slightly more mundane cutting and pasting and hanging and searching and putting together. (AF/D3)

5.3 D – The ideas used to describe the editing material and their relation to the construction of the cinematic experience

> I believe pretty passionately that one shouldn't overestimate the importance of technology in making editing decisions, because the biggest component of what I do is frankly psychological, *you know, whether I'm cutting a splicer through celluloid or pressing buttons on an Avid***.** It's trying to get into the mind of the director and therefore the material that they're presenting that occupies most of my time… There's no point in thinking, 'this is my film' or 'I want to say this about the world', that's not what an editor's job is. Sometimes you're trying to find out what people's creative vision is even if they don't know it themselves, so you have to use every trick in your armoury to do so, but that's what being an editor is about *as much as dealing with the material.* (E1)

The extract above encompasses some themes within the previous categories of description, such as technological parameters and user experience (italics), but emphasis is placed above these categories and on the importance of the communication between the editor and the director.

5.3 E – The issues that the expectations and experiences of audiences bring to the editing process

> I filmed a series just now… Well, it was filmed in such a rush that sometimes we had to call in a second camera. I hated it; I thought it was really corrupting my work, more than anything else. I don't mind having the restrictions of time. But if you bring in another camera, that is going

> to film with this idea that the camera is just covering the scene… *It's almost as if I have a phrase… and I need to tell a story… and I need three hundred words. It's not like this; they have to be the right words to tell the story. So you have to look for them.* But when you bring in this other thing that is just there to make sure everything is covered, there is an idea there that I have a real problem with… it is handy and I understand why sometimes you need it. People have it because they don't have the time, but it does corrupt the work. (D2)

What is particularly interesting here is how the presence of a second camera on a first unit shoot affects the director's experience of the editing process. In this case a pre-production (*pre-edit*) decision made by the producers of this series. Not only do the economic constraints that encompass the making of a TV series extend beyond the control of the director. There are also aspects of this situation that stretch back to the technological parameters encompassed by a second (video) camera that is able to run almost continuously without supervision from the director. These issues have a knock-on effect on what features of the image (e.g. qualities of composition, movement and duration) the director must use to narrate his story (a theme relevant to Category D). In this case, the editing material then contains moving images outside of, unplanned or undesired by this particular director. Hence, the use of a second camera can be seen here not only in terms of what the equipment *permits* (a wider selection of imagery) but also in terms of what it *obstructs* (images that are authentic to the director vision).

5.4 Patterns Demonstrated in the Outcome Space

The research findings presented thus far can be summarised through the following table. This presents the themes discussed by the interviewees as situated in and contributing towards an overall structure of awareness, i.e. their referential aspect and each component of their structural aspect (internal horizon, dimension of variation and external horizon).

category	label	referential aspect	structural aspect	
			internal horizon	external horizon
A	the editing technology represents a certain set of parameters within which the editor works	technological parameters	the parts of the editing equipment e.g. from a razor blade and splicing tape to the editing desk, software interface or computer's keyboard	the functions (such as capturing, cutting, splicing, playback, effects etc.), which are apprehended by the users of the editing technology
B	the features of interaction that editors experience when working with the editing technology	user interaction	the parts of the editing equipment plus the user's body	the haptic, spatial, procedural and durational qualities of the editor's interaction with the editing technology
C	the specific approaches that the editor adopts in order to organise the editing material	metacognitive focus	the strategies and tools for ingesting, logging, organising, assembling and reviewing the editing material	the experience and know-how which leads to certain ways of thinking about editing processes and their outcomes
D	the ideas used to describe the editing material and their relation to the construction of the cinematic experience	aesthetic/narrative explanations	the filmmaker and editor's views of the editing material	qualities (such as rhythm, tone, cadence) that are sought in the editing material for the construction of a cohesive narrative/aesthetic experience
E	the issues that the expectations and experiences of audiences bring to the editing process	cultural and sociological parameters	the cultural and social context of the audience's view, which also includes media events and objects of the past and present	expectations, conventions, regulations and protocol within the extended network of relations that exist between the producers and consumers of the artifact

Table 1: Referential and structural aspects of categories

What this table emphasises is that there is not one critical factor describing where or when the editing process occurs; instead, an analysis of the research interviews shows the editing process to be comprised by a network of related features. Each of these features plays an active role in the editing process.

While on the face of it some features of the process appear to be external to the editor (audiovisual material, editing tools, other participants in the filmmaking process), the analysis reveals that some aspects of these features appear to be internalised (how editing tools can be used, what audiovisual material can be used for, audience expectations, etc.). Some aspects of these features are present within the editor's environment, while others are not. Hence, some appear to be cognised in the direction of internal horizons of perception, while others are cognised towards external horizons of perception.

The tabulated format characterises what, in phenomenographic terms, might be considered the participants' 'collective anatomy of awareness' or 'col-

lective mind' and provides an instrument for discussing variation in the way the editing process is experienced. That is not to say that the editor's thinking is expected to be distributed evenly or simultaneously between each aspect of the process, but it does involve a distribution of cognitive activity across these five critical aspects.

One risk of this format is that it presents an artificial or conceptually abstract way of looking at the editing process if viewed in isolation. Therefore, it should be emphasised that the table arose from the analysis of the interview data. It is the content of the interview data that reveals how these various aspects, both internal and external, modulate the editor's cognitive activity. However, with the critical features presented in the table, the relation between the individual accounts of the editing process can be understood and analysed further.

5.5 Individual Vignettes

So far, by focusing on aspects of the editing process shared collectively within the interview sample, there are some contextual themes that have been ignored. Most of these themes can be traced back to, or emerge from, the rich tradition of cinema studies. And there is evidence in the interview data of some of the long-running debates within cinema studies regarding the structure and meaning of the cinematic artefact and the cinematic experience.

The various themes referred to in the interview data and relating to this debate include: 'structuralism, post-structuralism (AF/D3), structural/materialist film (AF1, AF4), abstraction (AF3), feminist film theory (E4), auteur theory (E2), psychoanalysis (E1), and Marxism (D1). These themes appear to be encompassed by the cultural and social parameters of a practice and are revealed along an external horizon of perception. However, it is difficult to discern precisely how theoretical debates relate to the interview subject's practice without engaging extensively in the theoretical context for each individual case. What is more, most of these ideas receive only cursory attention within the interview data itself. Therefore, I have chosen only three cases that draw attention to certain aspects of these debates and I will only refer to these contextual themes using the terms provided by the participant.

Each case is titled according to the main theme that the individual's editing process appears to be directed towards revealing or subverting. Around these main themes there appears to be an amalgamation of the other categories of description presented so far. These individual vignettes, then, provide further evidence of the interrelation between the categories of description and how some categories can be emphasised over others, and present further context for the patterns of awareness that they described.

AF1 – Looks for meaning in the material/technological process

AF1 has been making films for 35 years. Since 2003, he has been a Research Fellow at Central Saint Martin's College of Art and Design. He was instrumental in developing the British Artists' Film and Video Study Collection. In most of his productions, he shoots and edits his films himself. He tends to screen them to audiences at live events, in galleries, or online. For AF1, editing links the 'technological aspect' to 'conceptual ideas' within his moving image practice. He views the development of his practice both in 'technical practical terms but also in perceptual and aesthetic terms'.

> I think it's very much in the spirit of experimentation, so… I was trying out certain things that also had conceptual links as well. It wasn't just a purely technical and formal exercise, there were also conceptual links with themes within the work themselves. (AF1)

Despite believing in 'the spirit of experimentation', AF1 is aware that he has developed technical and aesthetic approaches to the editing process that he considers to be 'habits' that he would find 'hard to break'.

The key theme that AF1 identifies with within his practice is the 'materialist element'. Hence, the predominant focus of his practice is upon the physical processes that affect the medium. However, he also presents an awareness of the 'ecology' that any artwork will inhabit:

> I tend to think, in terms of everything that I do; there is always a materialist element even if it's not necessarily a materialist work in a way. I mean materialist in both the broadest and more specific technological senses, so in the rather mundane notion of working with material – physical material or non-physical material… And I think that is where the technological aspect is… because the technological aspect of these

things somehow bridges the material and cultural. Let's say, the material and the context – the environment. Or is the technological aspect of editing part of the environment? Part of where you are situated? So part of your environment is the fact that you're editing on a laptop or you're editing on a U-matic edit suite or a Super 8, or whatever, which is inevitably going to determine what you do in some way or other.

It definitely affects the mode, the way it's presented to you and the way you present yourself to it. I think these things are all very intrinsic, they're kind of… you can't pull them apart easily. There's a kind of problem of over-fetishising the purely materialistic in physical terms and the technological processes. I've done that as much as anyone else has in some ways, but ultimately it's all part of an ecology, isn't it? There's me, the material, the equipment, the room I'm in, etc. We're all actors playing a part in determining… and then there's the big other, the big object, the culture and so on, that's influencing you at the time, that's in the room as well. I think all these things are part of the process, part of the decision making. I think the editors are only one part of it. As an individual, I don't think any editor anywhere can really claim to ever have complete control or mastery of their craft. (AF1)

E1 – Looks for meaning in the story

Since the start of the 1990s, E1 has edited over 50 films for television and cinema. He has worked with a number of highly acclaimed feature film directors and documentary filmmakers, including Terence Davies, Pawel Pawlikowski, Benjamin Ross and Marc Isaacs. When interviewed, E1 places less emphasis on the technical aspect of the editing and more on the apprehension of narrative, which he describes as occurring predominately 'in the head':

What frame you choose to cut between A and B, that's a craft and that's an aspect of what one does, but it's not really usually the most important bit… that's technical. I mean, you know some people do it better than others; sometimes it's more important than in other projects.

The ability to perceive through the nasty mess of an assembly, to see the essence of a scene is definitely something you have to do in your head… as viewers you're thinking, why am I watching this dreary, drawn out, tedious, you know, bland, contrastless, dull material, because you are used to watching an exciting, condensed, finished, polished product… Part of an editor's job I guess is to develop a patience or an imaginative

> leap when viewing undigested material, be that rushes or, most of the time, loosely assembled cuts. (E1)

As well as these 'technical' and 'imaginative leaps', E1 describes a reciprocal process characteristic of some documentary productions, which extends over a number iterative stages:

> [There] were aspects of the characters, which became apparent whilst filming, so I would then edit and we discovered, "look, actually this is what's interesting about that character" and he would then go back and film a scene that would develop that. Or he would, knowing this was turning out to be something promising that would then inform his subsequent filming. (E1)

Rather than focus upon a relationship with a technological medium, as was the case with the previous vignette, the focus for (E1) is upon his relationship with the director and revealing the story that he or she is attempting to tell:

> Yes, it comes back to this getting into the head of the creator… if the director tells you, okay this scene is going to be scary, you're looking at it trying to think, okay how can this be scary. And, even if it isn't very scary at the moment you can see, oh I can put spooky music here, or I can make a sharp cut here, even in the dull undigested material. So, that's a crude example, but you get the point that you're primed if you like and what's difficult is to refine that statement. You're not usually looking at material and saying, I want to be scared. You want it to convey something more about character or meaning, and articulating that between you and the director, and rearticulating again and again. What's the purpose of this scene? What's the nature of this character? Where are we in this character arc? What's our level of identification? How scared are we? Are we more scared than the previous scene, or are we less scared? Those sort of endless discussions give you navigation through what is still the unmapped territory. (E1)

<u>AF3 – Looks to subverting or manipulating meaning</u>

AF3 has been making films since 1972. He currently shoots and edits his films. In 2011, LUX, the London-based artist film and video agency and distributor, produced a three-DVD boxset of his films. In 2013, Sternberg Press produced an edited monograph on his work, with contributions from Ian Christie, Mar-

tin Herbert, Kathrin Meyer and Ethan de Seife. Michael O'Pary (2002: 43) describes him as 'one of the most talented filmmakers of the post-war generation'.

> Well, I think my work is often quite playful and I don't necessarily have a particular objective that I set out with. I am personally seduced by things when I am, like, well I thought I was looking at that and it's that. And in real life it might be to do with seeing a face in a piece of torn wallpaper or something. But I guess philosophically the films are really to do with the fact that nobody really sees the world in the same way. And because we've got this objectifying thing called verbal language it does a pretty good job, but it gives us this illusion that sometimes we are seeing the world in the same way. We might think we've understood each other through our description of it, but in fact what we've experienced is actually something quite different. So I guess I've always been interested in pushing that and making kind of absurd connections between things, but also being fascinated by the fact that you can make those absurd things semi-credible, in a way. (AF3)

> Well, I mean, without trying to sound too pompous about it, I think like an interesting film will be teaching a language and there should be something new about that language, and when you start watching the film you're not really sure what it is. The things that I like watching, you're not even sure what genre it is, so you might be thinking is it a documentary or is it a horror film? For example, *Blight* starts off with buildings disintegrating and could be a film about poltergeists, watching a house self-destruct, turns out to be about something else… my work is quite manipulative in lots of ways, but what I like to do is get to the point where you are making the assumption that the viewer is starting to learn the language and then you change the language. (AF3)

5.6 Summary of the Roles Played by Editors, Directors and Artist Filmmakers

Although a phenomenographic approach to analysis has thus far provided a framework that can be used to categorise the different aspects of the editing process and examine the relationship between these aspects, it is important not to overlook the collaboration between editor and director and the various ways in which these roles can be described. Some of the conceptions or experiences described in these instances do not sit neatly within the aforementioned categories of description. The conceptions of these roles in relation to one another, as well as the conceptions of each individual's role, help to indicate the kinds of

cognitive tasks being carried out by the participants. These conceptions can be arranged according to the stratified sampling framework adopted at the beginning of the interview procedure. They are mainly relevant to understanding where the participants of this study situate their actions in relation to their external horizons.

Editors' perspectives:

> [Trying] to get into the mind of the director and therefore the material that they're presenting [is what] occupies most of my time. (E1)

> [There] are editors who are able to create worlds and then there are the others who can articulate a director's vision. (E2)

> [The] job of the editor is to find solutions and to play tricks and to use everything that you have got, from sound to ellipsis, to match things together that you would never have thought would be matched together and strengthen the story. (E4)

> [Part] of the job is to find that structure and find the best way to tell that story. (E4)

> [To] be smart enough to realise when you've cracked it and also know when you haven't is also very important, sometimes one can get too close to things and they appear clear, but they're not. (E2)

> [Ultimately] you're just revealing the film, the film exists, you're there to divine it and bring it to life, it's in the material anyway. (E2)

Directors' perspectives:

> You know the editor is given the material and then he shapes it and the director is out there getting the material. So it is like two different sides of the job. (D2)

> So some directors, and some very good directors who make authored films, sort of pop in at the beginning and come back and see how things are going, and some directors don't even watch rushes with their editors and somehow it is still their film. (D3)

> You somehow have to be in tune with somebody. (D3)

> So for what we do, I have to come in here with Cliff or Insa or any of the usual collaborators and say to them "no, that is too routine". We just have to find another way of coming at this information because the element of surprise has gone. (D1)

Artist filmmaker/directors' perspectives:

> I bully and cajole him into doing some things that he has no idea what I'm trying to do. I don't know what I'm trying to do either, but all I know is that when it works, we can stop trying to do what it is that I don't know what we are doing. (AF/D3)

> If I'm working with an editor, who has been three or four times on bigger productions, it's still painful for the editor, they're more like a technical operator, a manipulator of images on my say so. (AF/D3)

> You want an editor that can take control, you know [whispers] "cut there, on that movement"… and, in terms of the conventions of the industrial model of editing, you're working with an editor that sees that. (AF/D3)

Artist filmmakers' perspectives:

> [I am] basically taking images of the real world and making them other in some sort of way. (AF3)

> You get your rushes back and this is the raw material and you see where you are going wrong perhaps, or you see ways in which you can improve certain kinds of shooting. (AF4)

> I like going back to things if I don't like them, or redoing them. I mean, my whole process is very organic and I just build as I go along. (AF2)

> I start somewhere and then if there is something that catches my attention I will try and pursue that and see where that leads. (AF2)

The different conceptions of the editor's and director's roles, evidenced here, might initially be attributable to a personal point of view (such as 'bullying and cajoling' or being 'in tune with somebody'). However, underlying some of these differences are also particular narrative/aesthetic concerns (Category D) or approaches towards organising the material (Category C). As such, the views presented above overlap with and complement the categories of description. The interview data showed that there are certain things that an editor is expected to do that differ from what is expected from a director, or from the editing equipment. Most artist filmmakers and editors tended to express expertise in technical aspects of the process that directors did not, while directors tended to reveal more features of the social and cultural parameters that en-

compass the editing process. However, key differences between editors, directors and artist filmmakers were also previously articulated by those who have had experience in a variety of roles within the filmmaking process (see – 5.1 B – AF/D1).

These two sections (5.5 and 5.6) reveal a tension between research aims that are directed towards, on the one hand, a collective rather than an individual understanding or characterisation of the editing process and, on the other, uncovering cognitive tasks that involve a context-sensitive awareness. Further to this, the research findings have shown that the same individual can express different conceptions of the same phenomenon. This fact has also been reported in other phenomenographic studies (Marton & Pong, 2005).

5.7 Discussion on Variation in the Process of Editing

Rather than uncover variance between individuals approaching one specific cognitive task, the findings above present us with the variation in how a group of individuals approach editing in the context of their practice. Uncovering such a variety of tasks might be seen as both a strength and weakness of this research and of the phenomenographic approach. It does not reduce the cognitive process to a specific location, calculate how information is processed during a specific cognitive task or apprehend, through introspective analysis, what one particular individual holds to be the essential information upon which the outcome of an edit rests. Instead the question of 'where is the mind of the media editor?' has been approached by examining the experience of a group of individuals and then by analyzing the critical aspects of this group experience and the relationship between its features.

The research findings identified five critical, interrelated aspects of the editing process. They signify a clear challenge to the internalist notion of a fixed mental location. They do this on two key accounts. Firstly, the editors relationship to the editing process, while described by individuals according to a specific internal view point, informed by there own technical know-how or cultural knowledge, can not be separated from variables that are external to individuals – such as further developments or changes to any part of the editing technology, editing material or cultural environment. Secondly, the variation

described in the relationship between these five critical features helps to characterize each individual approach to the editing process. From here we might infer that while the editor's cognition involves an intermittent coupling to these various features, these are the features that nevertheless modulate the editor's cognitive activity. In essence, the editor's mental processes incorporate more than one particular activity and are not directed by activities arising from a singular location.

Variation in how editors' related to the critical feature of their environment and what this variation is attributed to is certainly worthy of further discussion. For instance, editors more concerned with narrative tended to underplay the contribution the editing equipment made towards their work, while those more concerned with materialist or structuralist themes brought the contributions of the editing equipment into the foreground. In this context it is interesting to recall what many philosophers have consistently noted; that when successful, technology has a tendancey to disappear (Rowlands, 2010: 158) or becomes 'phenomenologically transparent' (Wheeler, 2011). The expectation may therefor be that the editing equipment would not typically be identified in description. However the transparency of this relationship should not be taken-for-granted. For those interview subjects whose practices are concerned with materialist or structuralist themes and particularly those that explore the characteristics of the editing equipment it would be impossible to say whether this is consistently true. There may instead be fluctuations between when the technology is noticed or not, which in these cases is not always determined by the technologies success.

In a similar vain, the analysis of the research findings also uncovered the different ways in which one individual could experience the same process or environment. For example, for much of his interview participant E1 brought narrative features of the process (such as the purpose of a scene, the nature of a character, character development, emotional content and progression between scenes) to the foreground of his descriptions. On the whole, E1 characterises the editing process as being driven by themes articulated by the director and found in the editing material; these are then rearticulated at the various stages of the edit. However, when the technological features of the editing process are brought from the margins to the foreground of the participant's awareness,

they're instrumental role in film production or film style becomes apparent. For example:

> I don't think it's anything to do with technology – I mean; the technology facilitates a different way of thinking. It would be inconceivable to try to cut the sort of multi-layered huge amounts of material documentaries that are now commonplace on linear technology. (E1)

Here, evidence of situated thinking is also related to particular aesthetic or narrative qualities, which in turn generate certain sets of related audience experiences and then expectations, which in turn affect the culture of production. This point is also exemplified in the case described in 5.3 E, which concerned a TV series that used a second camera during the first unit shoot. Herein, D3 describes a scenario where editing decisions usually driven by aesthetic or narrative direction (Category D) are usurped by cultural and social parameters (Category E) driven by technological change (Category A). In this case, when control is drawn away from the director/editor partnership, this change ruptures the distribution of cognitive processes usually shared between director, editor and cinematographer.

The application of phenomenography throughout this research because it examines the experience described by a group of individuals, rather than that of one individual, has been able to generate research findings that are over and above introspective analysis. The features of the editing environment, or more precisely the editors' experiences of this environment, that were repeatedly discussed across the interviews have been identified using phenomenography's analytical framework. These aspects of the editing process shared amongst the interviewees represent, in phenomenographic terms, their 'collective's anatomy of awareness' (Marton & Booth, 1997) or a characterisation of 'the collective mind' (Marton, 1981). The 'parts' of this 'anatomy' have been understood, in the course of analysing these research findings, to modulate the editor's cognitive activity. From the 'second-order perspective' (Marton & Booth, 1997) offered through the phenomenographic approach, we can appreciate that even if some parts of this anatomy are not in the foreground of awareness does not mean that they are separate from that whole; taken in this study to be the cinematic form or what becomes the totality of the medium.

However, there is arguably a congenital feature to looking at the editing process from a 'second-order perspective' that negates the internalist conception of mind; the apprehension of the process presented in the research findings was not grounded within one specific location or one individual. What is apprehended is not just shared between the participants, since it is spatially and temporally distributed. The participants referred to their tools, their collaborators, the editing material, and the sequences of edited material, either from their memories or from within what was, in many cases, the editing space itself (even though that space was being used for the purpose of an interview and not to edit). Besides the matter of whether the descriptions came from memory or from an active editing environment, there is variation in terms of whether the moments in the process described come from before, during or even after the editor's active engagement with their environment. By seeking to categorise aspects of the process shared among the group and attempting to characterise editing from the perspective of the collective mind, it could be argued that processes characteristic of a specific moment or a specific location might be missed or obscured. The interview data does not record exactly what the subject's view of a specific sequence of events is or what is being thought about when a particular editorial decision is being made. The amalgam of descriptions presented in Table 1 might, therefore, lead to a concept of the editing space rather than explain the processes occurring within the editing space at the time of the edit.

The problem with the language driving these concepts, and descriptions of the interior aspect of this amalgam in particular, is that they differ from the editors' original experience. There is a limitation to the sense of interiority (which is so often considered a defining feature of mind) that can be expressed during an interview and in extracts of text presented in the outcome space. Furthermore, there is an issue with any characterisation of a 'collective mind' (or analogies of the mind as cinema or the mind as a computer, for that matter), regarding whether or not it maintains the sense of interiority that is often associated with mind. Although the purpose of this characterisation has been to provide a context for analysis of the editing process, it does not necessarily maintain the immanence of interiority. Instead, this expression of mind errs to becoming the conception of a process not observed as being directed exclusively from within one subject but between the activities of a number of environ-

mentally engaged subjects and the amalgamation of their various interior aspects.

5.8 What is the Evidence of Cognitive Extension?

Clearly, the most significant findings to emerge from the interview analysis are those that show a combination of both internal and external aspects drive the editing process. They show that there are ways of thinking described by the editors, which involve a special kind of subjectivity modulated by the intermittent coupling between the editor and the editing equipment.

These findings support the externalist model of mind and, in particular, the view that knowledge is revealed through transforming and manipulating internal and external sources of information (Rowlands, 2010). The idea that cognition is a *revealing activity* appears to be a particularly apt description of the editing process. Whether describing a process of searching through the editing material, removing unwanted material, or trying out different ways of combining the material, the evidence from the interviews indicates how activities within the editing suite reveal the final form of the work. The participants used similes for this idea, including: 'shovelling' (E1), 'mining' (D1), 'excavating' (AF2), 'distilling' (E1, E3), 'boiling it down' (E4), and 'weeding stuff out' (E3). But the link is also made directly by one editor – 'you're just *revealing* the film, the film exists, you're there to divine it and bring it to life, it's in the material' (E2, my emphasis). The correspondence between how a film was imagined and what appears before the filmmaker's eyes can, in some cases, prompt surprise. This might be the result of 'happy accidents' (AF2), but it could also be attributed to the careful re-ordering of the material (D3). One artist filmmaker proposed that, in the edit, 'you see things that you couldn't possibly have intended' (AF1). Above all, there is a sense that the final form of the film is discovered (or revealed) via a reciprocal process occurring between the film and its makers.

Understanding the different roles played by editors and directors and how they combine is an important step towards confirming the editing process as a distributed form of cognition. Beyond what one participant described as 'two sides of the job' (D2) – with the director 'finding the material' and the edi-

tor 'shaping the material' – there is an interesting contrast between the editor who attempts to 'articulate a director's vision' (E2) via the recorded audiovisual material, and the director who encourages his editors to 'find another way of coming at [the] information' presented on screen (D1). The dynamic between the director and the editor can be and often is marginalised, and the role of the editor is often overlooked or misunderstood (E4). But in the same way that marginalised effects of the editing equipment were brought into focus during the interviews, the richness and the characteristics of this dynamic were only made apparent during the course of some interviews. Explaining this dynamic were descriptions of being 'in tune with somebody' (D3), of communication 'without words' (E4), and of being like the 'two elements of a telescope' (E2). So, while the notion of cognitive extension tends to refer to examples of tool use, the exchange between two or more individuals whose activities are centred on a particular technology is also shown to be a critical stage in this process. The form the film takes should not be attributed exclusively to technical processes since it is also the result of the dynamic between those who work on the film and how they work together.

However, despite the sophisticated thinking required to edit believable, emotive or engaging audiovisual sequences, there was considerable ambiguity in the language used by participants in the study. Especially in terms of what exactly they were referring to when they described various aspects of their environment, or to be more precise, the string of associations that relate to what they were referring to. Hence what was at the margins of their awareness at any particular moment during the process and what the affects of these associations were was uncertain. For instance, it is unclear exactly what processes the phrase 'done in the head' (E1) is being associated with. Therefore, claiming that the interview data was able to provided a conclusive answer to the question concerning mental location, and more specifically how internal or external processes combine, might be premature. Although the editor's environment is clearly co-opted into the editing process, in some cases the exact formula by which various features of this environment combine continues to prove evasive. As one participant conceived of it, editing is 'a really weird random process' (E4).

Although the research findings do not explain how the interplay between internal and external information processing comes about, the outcome space is able to contribute to a discussion about cognitive extension by outlining the various cognitive activities contributing to the editing process. Table 1 presents an overview of the critical aspects structuring the editor's decision-making process. These aspects range from technological at one end to group consensus at the other. Specific approaches to, or ideas about organising the editing material (Category C) have been positioned at the centre of this range, in-between the technological parameters and user interaction referred to in Categories A and B on one side and on the other side, the concepts of artistic imagination and audience expectations referred to in Categories D and E. Category C thus signifies an aspect of the editing process where the knowledge and skills relating to these other aspects converge. Subsequently, this confirms the idea that the editor is situated between two poles, with cinematic technology at one end and the cinematic experience (or the idea of the cinematic experience) at the other.

The editor's thinking may be summed up as follows: editors give form to the ideas of a cinematic experience imagined by filmmakers using what has been revealed through the editing equipment. For example, when an editor proposes that, at some stage, 'it tells you what to do' (E3) he is referring to how the editing material drives the decision-making process. Alternatively another editor proposed that 'it comes from within the head of the director' (E1) and hence appears to foreground the director's imagination as the steering force behind the process. The latter indicates that there are features external to the editor's environment, or within the world of the imagination, driving the edit, while the former emphasises how features within the editor's environment play an active role. Critically, we might say that there are two kinds of thinking being referred to here: one that fits the environment around the filmmaker's imagination and another that responds to unexpected instances of abstraction or synthesis afforded by the technology. Hence, understanding the link between the internal and external aspects of the editing environment, it appears, is what editing is all about.

Chapter 6

Conclusion

6. Introduction

The research presented in this thesis has investigated the question 'Where is the mind of the media editor?' This question echoes a long-running debate, taking place within cognitive science and philosophy of mind, about the location of our mental processes. It is a question that divides opinion within these disciplines. For some, there can be 'no question that the locus of computational and cognitive control resides inside the head of the subject' (Butler, 1998: 212) and the assumption that 'everything we think, do and refrain from doing is determined by our brain' (Swaab, 2015: 3) is a persistent one. However, this debate has arisen because rather than blindly accepting that our mental activities correlate exclusively with brain activity, there are those who argue that mental activities extend to encompass aspects of the world beyond the brain alone (Clark & Chalmers, 1998; Clark, 2011; Rowlands, 2010). We are therefore presented with two apparently opposing models for the location of mind: the internalist model of mind, which locates mental processes exclusively within the brain; and the externalist model of mind, which proposes that the mind is best understood through an extended network of relations that, as well as the activity of the brain, are constituted by the properties of bodies, technologies and sociocultural processes in action.

In Chapters 1, 2 and 3 of this study, the aim was to establish why investigating the editing process is relevant to this debate. We have seen parallels between what is generally perceived as the primary objective of cognitive science; 'the study of how the mind acquires, stores and transforms information' (Eysenck, 2012: 3), and how, during the editing process, filmmaking technology is also required to carry out these tasks. Here, it is open to debate whether or not editors' minds work exclusively via internal representations of their environment. And also up for debate is the question of whether or not the processes of information transformation driving the edit, which characterise the kinds of thinking performed in the edit, are located exclusively within the brain. Rather than conclude that there are two separately situated or independently formed

versions of the world – a version represented internally and a version formed externally – proponents of externalism propose that we investigate the integration between internal and external forms of information processing during certain cognitive tasks (Clark, 2011; Rowlands, 2010; Wilson, 2010). The editing environment provides a setting for studying this process of integration because the editors' activities are dependent upon forms of representation and computation that appear to be both internally and externally situated.

In much of the film theory literature, the relationship between cinema and mind is discussed from a metaphorical perspective. However, those discussing this relationship often have no direct experience of the editing environment or of using editing equipment. There are cases, however, and the texts of Vertov and Eisenstein cited in Chapter 3 exemplify this, of filmmakers writing their own theories about editing processes in relation to mental processes. But what the examples of Vertov and Eisenstein also demonstrate are two very different approaches to how films are planned or conceived, with each approach placing a very different emphasis on the involvement of the world, technology or the imagination. Furthermore, over the course of these two filmmakers' careers, we are given contrasting descriptions of the filmmaking technology and how it can be used to represent or extend cognition during the filmmaking process.

Looking at how the process and practice of editing has developed since the time of Vertov and Eisenstein, it is clear that the variety and availability of filmmaking technologies used today have increased. As a result, the appearance of the editing environment and many of the activities performed by editors have changed. So, rather than assume that the editing process is still recognised in the same way as it was by Vertov or Eisenstein, the ways editors and filmmakers approach the editing processes were investigated in the context of the wide range of editing equipment currently available.

How the editing environment is experienced was investigated by applying a phenomenographic research approach. This approach provided a suitable and valid framework for collecting and analysing data; phenomenography does not assume in advance where the active features of a cognitive process are located or the ways in which a cognitive task may be approached. Phenomenography is described as a 'second-order perspective' (Gerber, 1993; Marton &

Booth, 1997), or as taking an approach to research that is 'simultaneously objective and subjective' (Marton, 2000: 105). Overall, the purpose of the interviews was not only to capture conceptualisations of the editing process that were faithful to the participant's experience, but also the variety of ways in which the processes they experienced within the editing environment were understood.

From a purposive, stratified sample, 14 editors, directors and artist filmmakers were interviewed. This sample made it possible to record accounts of the kind of thinking subjects had had while working either directly or indirectly with the editing technology. Wherever possible, the interview subjects were interviewed alongside their editing technology or in their working environments.

The interviews recorded explanations of the editing process that contrasted the differences between editing for documentary, docu-drama, drama, comedy, commercials and abstract cinema. There were also descriptions of the editing process that contrasted the differences between editing in an editing suite and editing as part of a live performance with a live audience. The participants in the interviews described experiences and differences between editing with a variety of audiovisual media, including 8mm, 16mm, video and digital video, as well as a range of linear and non-linear editing systems, including Steenbeck, Avid, Final Cut and VVVV. Two of the participants also spoke about merging a variety of audiovisual technologies in order to engineer unique hybrid editing systems of their own.

The research findings revealed a network of active features that constitute the editing process. From the analysis of the interview data, five qualitatively distinct categories for describing these features of the editing process emerged: technological parameters, user interaction, metacognitive focus, aesthetic/narrative explanations, and sociocultural parameters. It was found that while some features of the process appear to be external to the editor (audiovisual material, editing tools, other participants in the filmmaking process), other aspects of these features also appear to be internalised (how editing tools can be used, what audiovisual material can be used for, audience expectations, etc.). Hence, some aspects of these active features appear to be situated within an editing suite, while there are others that do not. Differences between the experi-

ences and conceptions of the editing process revealed variation in the structure of the themes within each category of description, as well as in the relationship between the categories of description. The interview data demonstrated that these categories of description were not only actively related, but could also be related to one another in different ways, according to the particular experience or approach to the editing process being expressed. Overall, when editors and filmmakers describe the process and practice of editing, they reveal to us that the editing process is distributed across various internal and external aspects of the editing environment.

6.1 Evaluating internalist and externalist models of mind in the context of the research finding

How would we situate these findings within the internalist model of mind? According to the internalist argument, aspects of the world that are external to a subject's brain do not constitute a part of a subject's mental processes (Adams & Aizawa, 2001; Butler, 1998). As such aspects of cognition that are external to the editor would not be considered as a part of their editor's mental processes. This would mean that the only active features of the editing process are the features of the editing environment that are internalised by the editor. Therefore all editing decisions would have to be made on the basis an internal picture of all the editing material formed and sequenced, in all varieties and possible permutations, within the editor's heads. However, whilst some participants certainly described holding aspects of their work internally there was no evidence to suggest that the images or the form of the films held internally by the editors were recognised as complete sequences, or that these were accompanied by completed synchronised internal audio sound tracks. Indeed, evidence from the interviews suggested that referring exclusively to an internally represented version of the film was insufficient to the needs of editors and directors. Examples from the interview data showed editors organised the editing material by rearranging what appeared through the editing equipment. These findings work to support the extended mind thesis, in particular Clark's (1999) assertion that rather than rely solely on detailed internal representations for every cognitive process, a far more efficient approach to problem solving is by 'off-loading' certain information onto the environment.

As well as illustrating the efficiency of cognitive 'off-loading', the editing process provides a good illustration of how our surroundings are involved in what Rowlands (2010) has termed 'cognitive disclosure'. What was heard in a number of cases were editors and filmmakers describing how their thinking was informed by processes of trial and error, of iterative steps occurring within the editing suite. Some editors described their job as 'revealing' what the filmmaker needed to know. In some cases, in order to elicit the form of a film, careful consideration was given to the 'visual rhythms' presented through the moving images and the combinatorial effects found in each 'rough cut'. This was done because of their ability to coordinate features of the editing environment; in the process facilitating the emergence of new directions in the filmmaker's thinking. Rather than following a preconceived script or plan of action, the kind of thinking that goes on here is affected by an externally represented view of what is being produced and occurs because editors are able to integrate the information being processed both internally and externally.

There are opponents of the extended mind thesis who have argued that any external processing of information is not 'the mark of a truly cognitive system' (Butler, 1998: 212). Adams and Aizawa (2010: 75), for instance, maintain that 'the brain processes information according to different principles than do brain–tool combinations'. This, however, is a point that is used precisely in favour of second-wave extended mind arguments, which maintain that while external information processing is radically unlike the way the brain processes information, the combination of processes contributes to the unmistakable characteristics of cognitive behaviour (Rowlands, 2010). And Clark (2010: 93), in his defence of the extended mind thesis, proposes that we should 'individuate the cognitive by its characteristic effects, not by its characteristic causes'. From speaking to editors who have worked with a range of editing equipment, it is clear that not only do different brain–tool combinations affect their experience of the editing process (because of the different haptic, spatial, procedural or durational qualities editors noticed when comparing different types of editing equipment), but different brain–tool combinations have also led to new styles of editing practice (such as 'multi-layered huge amounts of material documentaries' described by E1) and new roles within the production process (such as the 'shooting assistant producers' or 'edit producers' described by D3).

But Adams and Aizawa (2010: 67) have accused proponents of the extended mind theory of perpetuating a 'coupling-constitution fallacy', mistaking parts of a system as having the same properties as the whole. In other words, because some parts of a system support conscious thought, they hold that this does not mean that each part is actually conscious. They have accused proponents of the extended mind theory of creating a false understanding of the cognitive process, where tools would somehow acquire mental properties of their own. One should make it very clear, however, that there is a difference in finding mental processes to be distributed across a combination of parts, than to finding them located within one specific part of a process. Internalists favour the idea that there is something intrinsically cognitive about certain neurons (Adams & Aizawa, 2001; Butler, 1998). Internalists might assume that there is a solitary neuron or region of the editor's brain that is able to function in isolation, from his body or from the editing equipment, and achieve the necessary cognitive state required to edit a film. But from the research carried out in this study, it appears that the opposite is the case. The way in which the parts of the system combine, the critical feature of the editor's experience, constitute that which is crucial to understanding the editing process. From the evidence presented in this thesis, editors' mental processes appear to be constituted neither exclusively by internal processes, nor exclusively by external processes; instead, it is through a combination of both that we find the editors' thoughts being modulated.

6.2 To experience internal and external features of the editing process as a whole

Identifying the various features of the editing process and viewing the links between each of these aspects was a perspective that was achieved, in this thesis, through the phenomenographic analysis of editors' experiences. Even though the analytical framework of phenomenography works towards labelling the various features of the editing process, the most significant contribution towards locating the mind of the editor has not been recognised inside one of these features, or in trying to piece each part of the process back together after the activity of editing has occurred. While labelling the various aspects of the editing process provides some understanding of what resources structure the editing

process, what is of most significance, in terms of an actively editing consciousness, is that these various aspects form a whole and that a specific cognitive perspective occurs from within this whole. Taken from the editor's perspective we find cognition occurs in virtue of the external resources – the editing material and the editing equipment – found within the editing environment.

While much of the literature reviewed in this thesis has focused on the relationship between tool use and cognition, some externalists have made the case that we should not limit our appreciation of the extended mind exclusively to technological processes (Sutton, 2004; Tribble, 2005; Wilson, 2010). They argue that there is a socially and culturally driven context for cognitive processes, and thus there is 'a lot of variation in the kinds of transcranial processes the extended mind thesis embraces' (Wilson, 2010: 181). Some externalists have sought to encourage cognitive research within socially oriented environments (Barnier *et al.*, 2008; Chemero & Silberstein, 2008). In this respect, cinema has been a particularly suitable subject for research. Whether watching TV, going to the cinema, or seeing an artist's film in a gallery or at a concert, we encounter a range of social customs and practices in relation to the moving image. Because the approach taken in this thesis has been to examine the cognitive process from the perspective of the editor, it has been able to appreciate the social and cultural context in which editing takes place. The interview data presents examples of problem solving between filmmaker and editor, of thinking collectively, and of thinking towards an audience, towards a genre, towards a broadcaster, and towards the context in which a work will be viewed. Some participants even directed their thinking towards actively transforming the audience's understanding of this context. Hence, a view towards the extended mind emerged that also revealed its social and cultural orientation.

The interview data revealed features of the social and cultural context that affect how a film is edited but are not located directly within the editing suite. These features may be apparent in an understanding of narration, a feel for a particular cinematic aesthetic and the industry or cultural expectations thrust upon filmmakers or editors, each of these features is partially constituted by processes that occurred outside of the editing suite. What controls the form that these aspects of the editing process take extends beyond the editor's occurrent thoughts. Subsequently, the cause of variation in these external features

and how they combine should not be limited to the editing environment. Developments within the capabilities of the technology, the lives of the filmmakers, and a spectrum of sociocultural events constitute the context for, and in some cases the content of, the editing process. What constitutes the editor's thinking occurs along a continuum that extends forwards and backwards through time.

The making of a film by John Smith – interview subject AF3 – provides a strong example of this continuum's function. Smith's film *The Girl Chewing Gum* (1976) was originally screened to audiences at the London Film-Makers' Co-op; 17 years later, the film was reformatted and distributed internationally through a DVD compilation titled *Cinema 16 – British Short Films* (2003). Receptive to the film's ironic treatment of 'representation as absolute reality' (Smith, 1976), *The Girl Chewing Gum* was remade by audiences from around the world. Through a range of distribution platforms, from VHS to YouTube, some of these remakes found their way back to Smith. The experience of watching these remakes, coupled with the changes occurring around the film's original East London location, provided Smith with the impetus to remake the film himself. Titled *The Man Phoning Mum* (2011), because 'every second person walking by was on a mobile phone' (Smith, 2011), his remake follows exactly the same camera movements as the original and superimposes its grainy black-and-white image onto the HD colour video of 2011, allowing the features of two technological eras to collide in one location. Altogether, we find that what brought *The Man Phoning Mum* (2011) about becomes known through the world and the changes that occurred in it between 1976 and 2011. What is more, these changes provide us with the opportunity to know more of John Smith's mind.

The story behind *The Man Phoning Mum* (2011) exposes an understanding that the 'mind is the world knowing itself' (Pepperell, 2014) in a way that is absent from much of the empirical research found within the internalist–externalist debate. The arguments that derive from such research are generally communicated in a way that is abstracted from real-world activities. This is especially the case with brain-centred theories of the mind. While the future promises increasingly sophisticated techniques with which to measure neural activity, the dispute over which aspects of the mind constitute consciousness, or can be measured, appears to be unresolved. No matter how fine the details in a

researcher's understanding of consciousness are, without an affective mode of communication, their findings are unlikely to become meaningful to a wider audience. This strengthens the case against examining conscious activity in a way that is divorced from a worldly context, and instead advocates examining consciousness (and recording this process) through the technologies of art and design.

The filmmaking practices examined in this thesis show us that cinema presents us with more than just a metaphor for the way we acquire knowledge – it is a way of acquiring knowledge. Speaking to editors and filmmakers about their work has uncovered an understanding of what we, an audience familiar with the cinematic experience, often take for granted: the ecological processes occurring in and around the editing environment.

6.3 Reflections on the Research Process

"One thing about which fish know exactly nothing is water, since they have no anti-environment which would enable them to perceive the element they live in." (McLuhan 1969: 175)

McLuhan's analogy linking the swimming fish to a tool or language using human, raises the issue that the operations of the mind within media environment are so familiar to us that the characteristics of this setting often go unnoticed. Mental activity itself, specifically within this context, occurs from an imperceptible source. It is a point that appears particularly apt when reflecting upon the nature of the media used during the research process for this study. Stepping out of this process, I would like to point out the links between what was being investigated and how it was investigated. I also wish to reflect on some of the limitations of phenomenography (or how it has been applied in this study) that were highlighted at the end of section 5.7. These issues will be taken into consideration as I make proposals for further research into the process and practice of editing.

Although what was being investigated was the interaction between the editor and the audiovisual medium, some of the key characteristics of the extended mind model of cognition also correspond to the epistemological ap-

proach taken with this thesis. This is illustrated, in particular, by the iterative steps to data analysis and the technical methods that led to the presentation of the research findings. I have described how, once the interview data had been collected, the process of revealing each critical aspect of the editing practice from within this data was informed by epistemic actions conducted through cutting, pasting, organising and re-organising the data on my computer. Although these actions were performed predominantly on a word processor and using the qualitative data analysis software NVivo, this aspect of phenomenographic research is similar to certain descriptions of the editing process cited in the outcome space.

Of the steps in this process outlined in Chapter 4, the following correspond to the editing process (in brackets): familiarising myself with the text of the interviews (watching rushes), cutting statements down (topping and tailing/trimming scenes), grouping similar statements into tentative categories (making selects), drafting the outcome space (assembling the rough cut), conducting a further comparison of the categories (watching the rough cut) and checking the outcome space (checking the final edit). The software programs used in the research process afforded a way of thinking about and through 1,064 minutes of interview material: as words on a page, instead of audio and as chunks of text, instead of linear speech. The five critical aspects presented in the outcome space were revealed through a process of phenomenographic analysis reciprocal to the reduction and rearrangement of interview data. This process was partially constituted by the software programs used in the research process. In this respect, there are characteristics of the extended mind model of cognition that correspond not only to filmmaking processes but also to the knowledge production of this thesis.

The assumptions of phenomenography, as well as the researchers own experience were clearly laid out throughout the course of this thesis. Briefly speaking phenomenography was adopted as a research methodology as it was believed that it would be able to uncover the 'taken-for-granted understandings' we have of the editing process and by extension the location of the editor's mental activity. While phenomenography does not prescribe a set method for doing this, in order to record what understanding or experiences express the editors thinking, this study relied exclusively on interviews as a means of data

collection. Although phenomenography assumes it is possible to uncover a subject's 'taken-for-granted understanding' of a process through discourse, this researcher has found some limitations in relation to this method and the subject being investigated and makes proposals for further research in order to address these.

One of the most common concerns about the validity of qualitative research is that through interview findings you are unable know what a person really means (Kvale, 1995). Even though ordinary language is used in interviews, they are inevitably peppered with a rich array of metaphors. These augment mental activity but are not proven to capture the ontological foundations of mind. For instance, the sense of interiority expressed during the interviews was limited, especially within the extracts of text presented in the outcome space. It might be that source of understanding which phenomenography seeks to explore is in fact inaccessible. In other words, it may be impossible for the interviewer to ever know what is going on inside the interviewee's head when they have access to nothing but discourse? (Kelly, 2002) Furthermore, whether any characterisation of a 'collective mind' (Marton, 1994) maintains the sense of interiority that is often associated with mind was also though of as being limited (see section 5.7). This is perhaps not simply a weakness of the methodology but a limitation in the capacity of language to present an accurate account of other minds.

The possibility that language might distort a person's expression of experience, as well as the propensity for researchers to overlook the effects of language has not gone unchecked by phenomengraphers. Kelly (2002) asks whether researchers should take the conception of experience recorded during the interviews to be the aspects of awareness that influence a persons behaviour, or whether, even in the context of a semi-structured interview, people talk, explain and use language in specific ways for specific purposes. Taking this later point into consideration Saljo (1996) suggests that talk is a form of behaviour, an action and a part of life itself. "Language is not a device for representing the world, it is a medium for action: when you talk, you do things" (Saljo, 1996: 27). Therefore it is not simply a case of interpreting the words on an interview transcript in order to understand what an interviewee meant but including the context in which they are said within the research analysis. But ra-

ther than rely on interpretation or description to explain the relationship between editing the moving image and language, a possibility for further research might be to investigate directly the active role language plays in the editing process.

Within the context of the interviews carried out during this research, the language used to describe the relationship between the editor and cinematic technology, might also be considered as a technology in itself. In which case the taken-for-granted assumption of language itself, as with other media tools, may have tendency to go unnoticed when in use. As McLuhan (1996) illustrates with the analogy of a fish swimming in water – familiarity with language and any inability to find the 'anti-environment' to the linguistic communication of mental operations may obscure our perception of its effects. We feel, think and live with and through language, we do not experience objects and things in any absolute sense, we experience them as socio-cultural products used for some purposes and talked about in specific manners (Vygotsky, 1986). There are interesting examples within the interview data where interviewees describe the type of language or communication that is shared between director and editor (p.174 and p.188 of this study). One interview subject even addresses what he believes the limitations of language to be (p.186 of this study). However it should be stressed that the idea that language be considered a part of the editing equipment, or as a means of overcoming the limitations of the spoken word was not formulated when the interview process commenced.

Within the context of Clark and Chalmers's model of the extended mind, rather than focus on the limitations of language, they claim that language functions as a central means by which cognitive processes are extended into the world:

> Without language, we might be much more akin to discrete Cartesian "inner"minds, in which high-level cognition relies largely on internal resources. But the advent of language has allowed us to speard this burden into the world. Language thus construed, is not a mirror of our inner states but a complement to them. (Clark & Chalmers, 1998: 39)

While the interview data presented in this thesis is largely ineffective in expressing the absolute sense of the editor or director's inner states, it does reveal three characteristics of how language itself extends the interviewees cogni-

tive processes. Firstly how editors and directors label the equipment and activities within the editing environment, enabling communication and understanding of the acts being performed. Secondly the interviews record descriptions of what Clark and Chalmers (1998) term 'socially extended cognition' (or the language used in the editing process which provides access to the beliefs of ideas of another individual) and finally the language used by the interviewees allows them to reflect on their own internal thought processes. While the above characteristics of language can be deduced from the interview material, the analytical procedure in this investigation prioritized locating five critical aspects of the editing process expressed by the interview subjects.

Due to the methods of data collection used in this research, absent from the data are features of the editing process apprehended directly from observation or from instrument-mediated observation. If we consider the relationship between editor, director and the cinematic medium in which they work, it may be that demonstrating an idea is a clearer means of ensuring both shares the same point of view. There is no record of this in the interview data. The conversations recorded in the interview data describe some of the ambiguous short hand expressions that editors and directors use, but to fully understand what role these play within the editing process these phrases need to be seen within the context of a specific activity. Perhaps a more comprehensive examination of how language and technological activity function as complimentary processes to the users inner state would involve direct observation of the editing environment. Just as director or editor are not limited to the spoken word as there only means of communication, when investigating the editing process itself, language (in the form of interview data) might henceforth be viewed as complimentary to a range of 'coupling' tools available to researcher.

Therefore, in terms of further research into the process and practice of editing, I would suggest that direct observation of the editing environment could provide a more substantial record of the editing process. For instance on; where solutions to editing problems are to be found in terms of the steps it takes to find a solution, where the attention of the active parties is being directed toward and what tools are being used in the process. Instrument-mediated observation, through video, eye-tracking or the measurement of neural activity,

while recording only parts of the editing process, would enable the researcher to zoom in progressively towards the finer details of these activities.

According to Clark (2004: 51), 'it is above all else, a matter of empirical discovery, not armchair speculation, whether there can be a full-fledged science of the extended mind'. I would argue that this is precisely what the process and practice of editing provides us with: some of the most interesting discoveries regarding our capacity for cognitive extension are those made by filmmakers and editors. However, most audiences are usually focused on what has been discovered: the effects of cinema, as opposed to how they were discovered. But by demonstrating and documenting this process of discovery, we find where the evidence of the extended mind is at its most convincing. Now, due to the availability of affordable and suitable equipment with which to carry out studies into extended mental activity, the practical limitations that separate scientific and artistic research on the practice of editing are decreasing. The model of cognitive extension acts, therefore, as motivation toward further studies into the editing environment, through an approach that seeks all the benefits of interdisciplinary cooperation.

6.4 Editing as Mental-Disclosure

At a time when more people than ever before reflect upon their lives via a network of media technologies, what brings our knowledge of who we are into being and our awareness of the world into being – in the sense of Damasio's (1999) 'extended consciousness' and with regards to Merleau-Ponty's (1964: 58) examination of the 'bond between the subject and the object' – can be seen as the outcome of our coupled activities with some form of editing equipment. In terms of hardware this equipment takes the form of a laptop or a smart phone, In terms of software through an abundance of online or offline image, audio and word editing programmes. I would suggest, following on from the research presented in this thesis, that ways of thinking about the mind and consciousness,are revealed by and reciprocal to the characteristics of this equipment. I propose that further contributions to cognitive science could be made by continuing to investigate the editing that occurs outside of professional filmmaking

practices, but which also relates to the narrative structures and ecological processes revealed through the study of cinema.

In the context of technologies that present us with some aspect of ourselves, from home videos to social media and self-tracking, Merleau-Ponty's (1964: 59) call to investigate whether 'modes of thought correspond to technical methods' remains particularly apt. So too is the conception of technology offered by Heidegger in *The Question Concerning Technology* (1954/1993). Particularly notable is his distinction between: the ends that are reached by technical modes of thought, which Heidegger refers to as 'the technological' and 'the essence of technology', which Heidegger finds to be a way of bringing the nature of our being into presence:

> Bringing-forth brings out of concealment into unconcealment. Bringing-forth propriates only insofar as something concealed comes into unconcealment. This coming rests and moves freely within what we call revealing. (Heidegger, 1954/1993: 222)

Heidegger found technology to be a way of revealing knowledge that is either hidden within us or within the world. By thinking of editing as an activity that cuts or joins, we can embrace a fundamental process by which we extend our understanding of the world, between subject and object, or the experience afforded us through our environment. I therefore find it significant and fitting, that this internal–external dynamic, which has been discussed extensively throughout this thesis, is also found in the etymology of the verb 'to edit'. The word stems originally from the Latin *editus*, which is the past participle of *edere*, 'bring-forth, produce' (ex-, 'out' with -dere, combining form of dare, 'to give') (Barnhart & Steinmetz, 1999). So rather than separate the mental processes into finer and finer atoms, research into editing processes brings together various ways of knowing the world. Research on the practice and process of editing has been shown to reveal how knowledge is 'given out' or 'brought forth' in both a practical and artistic context. This approach is vital if we are to maintain a constructive dialogue between science, the humanities and consciousness studies.

Further research in this field could benefit from the conceptual framework, which emerged from the descriptions and analysis of the editing process and practice presented in this thesis. The table in Chapter 5 presents an in-

strument for discussing variation in the way that the editing environment is experienced. This framework does not represent a set of fixed rules or a hierarchical system that determines the order of the editor's work. What it encompasses are the critical interrelated features that, according to the experiences of editors and filmmakers, drive their thought processes. In doing so, it seeks to establish progressive position that aims to inform further research and safeguard against a one-sided fragmented or fixed view of the editing process. The benefit of the position argued here is in knowing that the cognitive process can be driven by a combination of features situated both internally and externally to the editing environment.

The interviews presented in this thesis describe what features of the world are active in the editing process and their contribution towards what constitutes the cinematic experience. Variation in the way editing is practiced can be attributed to structural differences relating to the editors' external environments. These structural differences are expressed in the different settings, technologically and culturally, which we find editors in. To put this in its simplest terms: we would only be investigating one aspect of the editor's thinking if we were to study the brain processes alone. The study of editing, therefore, brings our understanding of the mind away from an exclusively brain-centred focus and towards understanding mental processes as extending throughout the world. Cognitive extension is given not as a projection from within the editor's head, but through the reciprocal relationship between internal and external features of the editor's world.

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