**Manipulating affordances in practice: A hermeneutic phenomenological study of mobility impairment and uses of digital technologies in work**

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This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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This thesis results entirely from my own work and has not been offered previously for any other degree or diploma.

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# ABSTRACT

This qualitative, interpretive study uses a triad of theoretical lenses - affordance theory, hermeneutic phenomenology and the social barriers model of disability - through which to gain an understanding of how people with mobility impairments use digital technologies in their work practices. A hermeneutic phenomenological methodology is used to reveal the phenomena, then to interpret the subsequent text through understandings of accessibility and use-potential which derive from the social barriers model and from affordance theory respectively. The significance of the study for policy, practice and research is a better understanding of how mobility impairment impacts workers who have historically and currently, been and remain, un- and under-employed. Eleven participants, all with mobility impairments, some self-employed and others employed, but all white-collar professionals or management-level 'knowledge workers', constitute the purposive sample used in the study. The participants all work in a variety of configurations of 'flexible work arrangements'. What was found was that the primacy of space, place and the objects and technologies in that space has heightened significance for people with mobility impairments. When confronted with negative affordances which amount to potential or actual barriers to access and participation in workplaces, people consciously set about finding specific, unique and personal solutions in order to participate. What they learn, through metacognitive processes and in response to potential or actual barriers, is how to manipulate negative and non-affordances of space, place and technologies into positive affordances, by doing things differently, by doing things better, or by doing different things, in order to participate in work practices.

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**NOTE**:  Efforts have been made to make this thesis accessible to readers with low or no vision through the use of 'Alt Text' which describes photographs, arrows, tables and non-text items. Screen-reading software reads these descriptions aloud in the digital version of the thesis. Alt text is not normally visible when reading the document. It is located through the properties of the non-text item.

# ACKNOWLEDGEMENTS

# CHAPTER 1 - INTRODUCTION

## 1.1 OVERVIEW OF THIS CHAPTER

This introductory chapter begins by situating the professional and managerial workers in this study, all with mobility impairments, in terms of work opportunities, as the British economy began emerging from the international economic recession following the first decade of the twenty-first century. The chapter also situates these workers in an 'increasingly globalised society' (Roulstone, 2002, p. 628), one in which their work is mediated by digital technologies which afford distributed work practices. In this environment, where insecurity is characteristic of twenty-first century employment for all workers, not only workers with disabilities (Roulstone, 2002), people with disabilities have ongoing struggles to find work and then to progress in it, despite a framework which has enshrined equality into law. The background context of work for these professional and managerial-level personnel is followed by an outline of the research design, sampling and definition of terms used. The gap identified for the study leads to the research questions which, in turn, determine the methodology, hermeneutic phenomenology. The chapter ends by briefly outlining the chapters of the thesis which follow.

### 1.1.1 The work environment for disabled people

Traditionally and historically, employment opportunities for workers with disabilities have been limited and remain so (Barnes, 1991; Department for Work and Pensions, 2015; Harris & Thornton, 2005; Jones, 2008; Jones & Wass, 2013; M.J. Oliver & Barnes, 1998; Rogers, 2009; Roulstone, 2004, 2012; Sapey, 2000, 2004).

Recent policy in the United Kingdom (UK) has been directed at transforming the unemployed component of the labour market into a working population of independent, goal-directed individuals with personal career aspirations, while simultaneously extolling the 'undeniable business benefits' to employers[1]. The 'good for business' campaigning is aimed at attracting employers who could employ workers with disabilities as part of the 'welfare-to-work' political agenda of the Department for Work and Pensions (2015). While this is clear enough and schemes are in place to assist people with impairments to find work, return to work, stay in work and work flexibly through different modes of employment, for example, by grants from schemes such as Access to Work (House of Commons, 2015a, 2015b), there is a continuing shortfall between the numbers of people with disabilities who want to work and the recruitment opportunities available[2]. In addition, statistics show that barriers to employment exist for many of these potential workers. The Life Opportunities Survey (2015a, p. 15), commissioned by the Department of Work and Pensions, tracked social participation in different areas of social life. It was a longitudinal survey (over three 'waves' or time periods of two years each over six years) and looked at 'participation restriction'. In its key findings on work and participation, a depressing picture is painted for workers with impairments:

> Most adults who were employed at both waves did not report any enablers which helped them at work. Similarly, most adults who were economically inactive at both waves did not report any enablers which they needed to be able to work.

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[1] https://www.gov.uk/government/news/disability-confident-campaign-celebrates-2-years-of-success

[2] Access to Work is a government scheme which gives grants to enable people to start work, stay in work or become self-employed. https://www.gov.uk/access-to-work/overview

The survey found, in wave 2, that in the top four barriers to work, the 'health condition, illness or impairment' itself was the biggest barrier, followed by family responsibilities, then lack of job opportunities and finally, lack of qualifications, experience or skills. As negative as this survey may be, it does reflect an environment in which opportunities for work are limited for people with impairments and one in which there are expectations of low incomes for these workers (for example, OECD (2003);WHO/World Bank (2011)). The final report of the Life Opportunities Survey concluded that working-age adults with impairments are 69% more likely to be unemployed than those without impairments and, perhaps predictably, less likely to have had formal qualifications (Office for National Statistics, 2015b). Other studies show that more disabled people are self-employed compared with non-disabled people in European Union countries (Pagán, 2009).

The problem of unemployment and under-employment in this sector of the labour market is historic and unresolved, despite policy and despite anti-discriminatory legislation. As Pearson and Watson (2007, p. 120) point out, 'there is no straightforward answer' to solving the collocated problems of un- and under-employment. Expressed similarly, there is no one strategy for workers to 'thrive and survive' in paid work (Roulstone, Gradwell, Price, & Child, 2003). Nor has one policy or initiative been responsible for the marginal upward trend of gradual, but apparently continuous, improvement for employment for disabled workers (Jones & Wass, 2013). This is a historical problem. Only four decades ago, Miller and Gwynne (1972, p. 77), conducting research into the living conditions of disabled residents in residential 'institutions', wrote of physically impaired residents:

> Jobs, however, are more difficult to find for cripples than for the able-bodied and, once obtained, more difficult to hold. …the disability almost always obtrudes into the relationship between employer and employee. Cripples

> frequently report peremptory dismissals without explanation. …One should
> perhaps be surprised that more cripples do not give up the struggle and seek
> some kind of sanctuary.

This (subsequently discredited) research became the catalyst for disability activism, protest and the resultant 'social model of disability' which – all together – led to anti-discrimination legislation in the UK. The social model of disability states that impairments do not disable; rather, society erects barriers to people with impairments that undermine social and economic participation. Despite changes enacted into English law, frequently the lowest and poorest-paid levels of work are all that are available for workers with disabilities (Jones & Wass, 2013). Furthermore, (and at the time of completing my research), a Select Committee in the House Lords (2016), in 'post-legislative scrutiny' (Paragraph 2), reviewed the adequacy, implementation and enforceability of disability legislation. The resulting report concluded that extant legislation has fallen short of the expectation that barriers to social inclusion can be addressed satisfactorily by the government. In the view of the Select Committee (Paragraph 20):

> it is the Government that bears ultimate responsibility for disabled people, and
> it must be structured to discharge that responsibility. Currently it is not.

### 1.1.2 My curiosity

Against this general background, I developed an awareness of a puzzle that became, following a literature search, the beginning, although not the focus of my research. The puzzle which emerged was why so few managerial and professional workers with mobility impairments are employed in desk-based positions in the mainstream economy. I have a personal interest in the topic, being the wife of a professional man with a mobility impairment who is a long-term wheelchair-user as a result of

childhood polio and who subsequently became a participant in this research project. We have been discussing the topic of technology and its potential to reduce workplace barriers for people with physical impairments for many years. Furthermore, I am aware of the reasons why he decided to work from a home-based office, why he decided to become self-employed and how he runs a professional practice remotely from a standard office with staff [3]. The puzzle as to why so few managerial-level workers with mobility impairments are in paid employment was to remain an unresolved one which, although outside the scope of my research, has been a very longstanding issue. My aim is not to resolve this macro-puzzle which is decades old (Rogers, 2009) but to add some understanding as to how work for people with mobility difficulties can be rethought, through examining phenomena that come to the fore through people's use of technologies. Finding managerial and professional-level workers with mobility impairments in paid work as participants for this study, was a particularly difficult enterprise, as I discuss in Chapter 3. However, I remained focused on finding participants who would give the answers to my research questions and located eleven suitable managerial and professional people, all with mobility impairments, all using digital technologies in the course of their paid work. Intial contact with prospective participants quickly revealed people working in different places, connected to clients, staff and colleagues both remotely in various UK cities, as well as internationally.

Once the empirical work was underway (starting with the first participant, a pathologist working in a laboratory), it quickly became clear that this study would be one of 'usability'. Initially, this was because I was asking for demonstrations of technology use in practice, but as the research progressed, usability was clearly linked

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[3] I have addressed the ethical issue of researching a family member below in Chapter 3.4.4.

to the spatiality of the built environment. Spatiality for Heidegger (1962) is a matter of a totality of equipped space through which practices are constituted. While the questions remained broadly the same to participants, my new understandings and interpretations became nuanced by the very observations and discussions I was having, which I then took to the next participant. By the time I had a discussion with the final participant, I was actively looking for usability in terms not only of technologies, but also of spatialities. Usability of space, place, events and things, all pointed to an interpretation through the affordance theory of J. J. Gibson (1986).

How people use technologies very quickly showed up in terms of *where* and *how* they worked, and in what modes of employment, because some people immediately made the point that the only way they could work was, for example, in home offices connected remotely (both locally and internationally) via digital technologies to their employer, clients or staff. In this way, spatiality and the usability of that space became one very early strand of the literature search. This led to another early strand: modes of employment - by which I mean flexible work arrangements and self-employment, both of which are significant for most of my participants. Some of the participants work at home, in home offices organised around their particular mobility needs. Some work with flexible hours and others work in different combinations. Some are self-employed, working from home-offices and heavily reliant on digital technologies. One participant in a home-office is connected by digital networks to the council for whom he works. As the research will show, these arrangements are critical for some people to be able to work at all. The participants' work takes place in the context of what Roulstone (2002, p. 634) terms the 'hyphenated' worker of the twenty-first- century service-sector (of the larger economy).

### 1.1.3 The 'hyphenated' worker - flexible work arrangements and self-employment

This 'hyphenated' worker – 'part-time', 'short-term', 'self-employed' or 'home-based' – to whom Roulstone (2002) refers, is an excellent description of the participants of this study[4]. An increasing proportion of the working population has access to some sort of flexible work arrangements in the UK. Between 1998 and 2012, there was an increase from 13% to 54% of employers (mostly small and micro-sized, that is, employing up to 49 people) offering some type of flexible work at home (based on a survey of 135,000 employers (Chartered Institute of Personnel and Development, 2012)). Mostly, flexible work arrangements are viewed positively for both employers and employees (Bailey & Kurland, 2002; Burnett, Gatrell, Cooper, & Sparrow, 2010; Fogarty, Scott, & Williams, 2011; Ruiz & Walling, 2005). This positive view of flexible work arrangements is also reflected in government policy as the right to request (but not to demand) flexible work arrangements (ACAS, 2015). Expansion of flexible work arrangements has materialised in tandem with technological advances in communications and technology, as well as understandings of benefits to both business (mostly reduced costs) and employees (CBI/Harvey Nash, 2011). This Confederation of British Industry (CBI) report indicates that flexible work mostly means 'family-friendly' hours (p. 34) but, increasingly, the smallest firms are offering expanded arrangements (for example, working from home). In the UK, the government has backed the creation of an employers' group to promote flexible work arrangements to large corporations and some major corporations have signed up as members of the Employers' Group on Workplace Flexibility (Lloyds Banking Group,

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[4] To these definitions I add: 'knowledge-worker' and 'white-collar'.

2012; The Future of Work Institute, 2012). As Massey (2005) points out, people no longer need to work in close proximity to each other since technology increasingly enables remote or 'distributed' working (also Eriksen (2001); O' Leary, Orlikowski, and Yates (2002); Virilio (2000)).

Simultaneously, employment patterns for all workers have changed, characterised by an increased sense of work insecurity, particularly in uncertain, expanding and increasingly mobile labour markets (International Labour Organization, 2015; Roulstone, 1998). In a recent report on the changing nature of employment, and in an analysis of employment patterns in over 180 countries (at different levels of development), the International Labour Organization (ILO) found that full-time, traditional employment contracts now represent fewer than one in four positions (International Labour Organization, 2015).

Another type of 'hyphenated' worker competing in this labour market is the 'self-employed' worker. Self-employment is, like flexible work arrangements, another expanding mode of employment in unstable and increasingly globalised labour markets. According to the Office of National Statistics (2014), self-employment in the UK is higher than at any point in the past 40 years and the rise in total employment since 2008 has come about mainly from the self-employed sector, despite the fact that more than half of all start-ups fail within the first five years (OECD, 2015). D'Arcy and Gardiner (2014) found that there are not only structural economic factors accounting for a steady rise in self-employment (reflecting better-educated workers, often in the service sector), but that cyclical factors (specifically, economic downturns and upswings) are factors in changing levels of self-employment. For example, they claim that 27% of people who became self-employed in the post-recession years (after 2012) did so due to a lack of economic opportunities and better employment

alternatives. The literature on self-employment for disabled people often refers to this lack of alternatives as a major reason for disabled people working in this mode of employment.

It was in such an economic climate that I designed my study. Simultaneous and interconnected factors constituted this background when the study began. All workers were facing a public policy environment of 'austerity', fuelled by concerns with high levels of public debt and deficits, both of which were used to justify cuts in public spending (Krugman, 2015). In this period, the number and percentage of professional, managerial and senior personnel working as self-employed in the UK, increased to 32.5 percent of the 4.6 million people who were self-employed in 2014, something encouraged by the government (Department of Business, Innovation and Skills, 2015). With a policy environment reducing the number of public sector jobs, came a greater reliance on the role of the private sector in job creation. Simultaneously, government policy was directed at encouraging private sector employers to offer flexible work arrangements (Department for Business, Innovation & Skills, 2015). This was all incorporated in a larger policy environment of 'welfare-to-work' supported by various schemes to enable this (for example, 'Work Choice').[5]

## 1.2 RESEARCH DESIGN

### 1.2.1 Summary of the research design

In terms of these economic and employment considerations, I wanted to gain an understanding of potential barriers for workers with mobility impairments by extracting meanings from observable phenomena in their workplaces. The identified

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[5] http://www.publications.parliament.uk/pa/cm201516/cmselect/cmworpen/363/363.pdf

gap in the literature led to the research questions; the research questions identified a possible methodology, hermeneutic phenomenology, which is a research strategy employing qualitative methods to gain understandings through revealing phenomena. What makes the methodology 'hermeneutic' is that a text is created from the empirical work, for interpretation. What makes it phenomenological is that the researcher is looking for that which appears out of observed phenomena 'to show itself' (including hidden meanings) (Heidegger, 1962, p. 51). The unit of analysis in this methodology is 'phenomenon' (Heidegger, 1962; Mulhall, 2005; Palmer, 1969; T. Wilson, 2015).

Broadly, at an early stage, my immediate goal in answer to Silverman's (2006, p. 66) question as to 'what is going on here?' was to find out what was revealed by the phenomena as seen, as I outline in Chapter 3. To create the text, I collected data from observations and discussions with the eleven people who fitted the sampling criteria (also outlined in Chapter 3). I used the raw data to create a 'main database' from transcribed recordings, then reduced into categories, then further funnelled into six themes. From this evidence in Chapter 4, I reconstructed the text into a synthesised interpretation in Chapter 5.

### 1.2.2 Sample

Eleven managerial and professional workers constitute the purposive, non-random, non-probability sample. My sample is a snapshot of a very small minority of disabled workers whom Shah (2005) terms 'high-flyers'. I prefer Zola's (1982) term,'successful mainstream adapters' and this description fits the eleven people in white-collar, high-level managerial or professional work in this study, none of them in manual or low-paid work. While definitions of what disability is and who it includes are contestable, for practical purposes, I use the definition in the Equality Act 2010,

which aggregates and strengthens previous legislation to include European directives and defines a person with a disability as one with a physical or mental impairment which has substantial, long-term, adverse consequences for carrying out day-to-day activities. Employing the social model of disability as a guide, I refer to both 'people with impairments' and 'disabled people', but using both in full recognition and acceptance that society disables by erecting barriers of different types, while impairments do not.

### 1.2.3 Use of theory

Three main theoretical positions inform my approach to the study as well as my interpretations.

Firstly, there is the 'affordance' theory of J. J. Gibson (1986) supplemented by clarifications by his wife (E. J. Gibson, 2000; E. J. Gibson et al., 1987; E. J. Gibson & Schmuckler, 1989).

Secondly, I use the social barriers model of disability (Roulstone, 1998) and supporting theoretical literature which incorporates phenomenological ideas of embodiment and rights (Hughes, 2007; Titchkosky, 2011).

Thirdly, I use Heidegger's contention that equipped social practice is constitutive of human understanding. In this view, what we *do* and *know* is implicated in who we *are*. I supplement this with complementary practice theory which flows from it (Heidegger, 1962; Leonardi, 2011; Orlikowski, 2007; Reckwitz, 2002; T. Wilson, 2015).

An area subsumed in practice theory is learning in 'social learning systems' (Wenger-Trayner, Fenton-O'Grady, Hutchinson & Kubiak, 2015; Wenger, 2003) which I use in the data analysis phase to demonstrate how people engage in the metacognitive

processes of 'productive inquiry' (Cook & Brown, 1999) to effect solutions to problems in communities of practice. In this study, the problems arise out of people's mobility needs, and concern the immediate usability of space, place, and objects (J. S. Brown & Duguid, 2001; Cook & Yanow, 1993; Eraut, 2000, 2004, 2009; Gherardi, Nicolini, & Odella, 1998; Orlikowski, 2002).

## 1.2.4 Defining terms

I include here a brief glossary of key terms in order to expand on their meanings in the context of this research.

*Affordances* are 'possibilities for action in the environment' (Sanders, 1997, p. 108) and, like Sanders, I use it in the original meaning that places, spaces and objects have potential for use, which are negative or positive for different users (J. J. Gibson, 1986).

*Communities of practice* 'are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly' (Wenger-Trayner, 2015).

*Disability* refers to barriers produced socially through attitudes and structures while *impairment* refers to a physical, limiting condition resulting in reduced mobility.

*Hermeneutic phenomenology* is both a philosophy and a research method. It is a type of phenomenology that interprets phenomena and is predicated on the work of Martin Heidegger. Heideggerian philosophy (and the work to which I refer) is concerned with the ontological issues of who we *are* and how we understand ourselves in terms of what we *do* in 'equipped' practice (Heidegger, 1962). We understand our potential for *'being-in-the-world'* as our participation in it, in terms of what is *'ready-to-hand'* – that is, what is available and usable – or not, in which case it is termed *'present-at-*

*hand'* (Heidegger, 1962, p. 184). Since usability is linked to availability and access, it is a good partner to affordance theory (as I explain in Chapter 3), for, when things are not *'ready-to-hand'* they do not afford participation.

*Knowledge workers* refers to white-collar, desk-based, skilled computer users (doing *'knowledge work').*

*Mobility.* The World Health Organisation (2001) in its classification of impairment, activity and participation, defines mobility in terms of 'changing body position or location or by transferring from one place to another, by carrying, moving or manipulating objects, by walking, running or climbing …'. While this biopsychosocial (medicalised) model of disability theory is incommensurate with my theoretical perspectives, this definition of mobility is broadly how I understand 'mobility'.

*Technology* refers to digital computer technologies, including communications and adaptive technologies.

## 1.2.5 The gap

Following a review of the literature (in Chapter 2) I established a gap for my study and an originality claim at the same time. There was a shortage of recent (qualitative) literature in different sections of the literature review in peer-reviewed academic journals on self-employment for disabled workers, disabled workers and flexible work arrangements, disabled workers and the spatiality of work, affordances and disabled people at work, professional/managerial disabled workers  and creative learning in workplaces[6]. I found no qualitiative studies at all about disabled employers who

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[6] REFLECTIVE NOTE: But plenty in 'grey' literature like blogs, also in activist, charity and government policy (and, not surprisingly in medical/rehabilitation literature).

employ workers other than carers (and three of my participants were employers of another 27 people between them). I found no study like my own in academic databases, giving me an originality claim as well as a gap for my study. This gap led to my research questions that follow (which in turn led to the choice of methodology).

### 1.2.6 Research questions

1) How do people, in managerial and professional employment, who have mobility impairments, use digital technologies in their workplaces?

2) In what ways can affordances of technology be revealed as phenomena in work practices?

3) In what ways can these phenomena be interpreted?

The first question is descriptive and is answered as I lay out the evidence in Chapter 4. The remaining two questions are analytical and are answered in the discussion chapter, Chapter 5. While it may be considered risky to frame the third question so openly, it is not really possible to know what the phenomena will reveal until the research is underway. When affordances of space and technology were revealed as positive or negative, that is, useful or not useful in research question 2, I was able to interpret them in question 3 in terms of the social barriers model of disability, affordance theory and Heideggerian phenomenology to arrive, through a thematic analysis, at my interpretations in a holistic way. Interpretations that are holistic, are constituted by their elements, known as the 'hermeneutic circle' (Heidegger, 1962). The hermeneutic circle is an analytic that examines the parts, in relation to a referential whole, to arrive at a holistic meaning of phenomena (Ilharco, 2002; Introna, 2008).

## 1.3 RATIONALE

There are various reasons that make the research undertaken significant and worthwhile. Three important areas which I have identified concern workplaces, employment and why and to whom this kind of research could be useful in practice. In each of the three following subsections, I outline what my research might contribute.

### 1.3.1 Spatiality, mobility and inclusion

Work practices are inherently spatial – people move and work in these spaces and between them, going from place to place in and through the built environment, getting to work and being in it, as they traverse 'landscapes' of practices (Wenger, 1998). Or, expressed differently, 'practices unfold through mobilities' (Hui, 2014). In social practices, people may be structured out of participation if the space, place and things are inaccessible (Titchkosky, 2011). If they cannot move in such places, mobility becomes an issue of spatiality and potential exclusion (Imrie & Thomas, 2008). Examples given by Gleeson (1999) include venues, meetings, lifts, offices, transport and a host of other public spaces. In this way, spatiality, social practice, participation and social inclusion are linked in ways in which immobilities can be thought of as social exclusion (Hannam, Sheller, & Urry, 2006).

My research will show that affordances of space, place and objects need to be positive in order for space, place and objects to be usable. Access and usability afford participation. Conversely, barriers imply non-usability and therefore non-participation.

### 1.3.2 Practical use of research

This kind of research is useful for employment practice in that it provides insights gained from understanding the spatiality of workplaces and potential barriers in them. As 'social learning systems' (Billett, 2004, 2009; Wenger, 1998), workplaces are constituted by work practices and different modes of work (through flexible work arrangements, for example) which can obviate such barriers. How people find solutions to problems in the learning environment of the workplace can be harnessed to 'make things work'. As Orlikowski (2002) found, we also need to know more about learning in distributed workplaces in which 'knowing-in-practice' is mobilised for organisational knowing.

Furthermore, my research shows how affordance theory can be made practical for use in practice-based research. I demonstrate how the learning that guides people's decisions can be made explicit for practical purposes (in deciding how to manage spatiality, for example, in Chapter 5). I also take up Parchoma's (2014, p. 367) challenge to show that affordance theory can be used in empirical studies:

> as in situ enablers, restrictors, and regulators in distributed collaborative teams' knowledge production activities.

### 1.3.3 Employment

Historically, disabled people have been in low-paying, unskilled and semi-skilled work, very often on the fringes of organisational life (Gleeson, 1999; Roulstone, 1998; Schur & Kruse, 2002). Barriers exist in workplaces and built environments and are frequently a combination of attitudinal and other barriers. Even if one discounts definitional problems (of 'disability' and of 'work'), disabled people wanting to work

are far less likely to be in employment than non-disabled people (Evans, 2007; Vaziri, Schreiber, Wieching, & Wulf, 2014).

My research shows that when the affordances of space, place and objects are positive and spatiality is enabling, then people with mobility impairments might be able to work, possibly only from home offices, possibly only with adaptive software and hardware, but nevertheless, such arrangements can amount to inclusive participation.

For all of these reasons, researching my topic was a worthwhile endeavour.

### 1.3.4 Contribution

My study suggests that identifying usability in terms of affordances is a viable way of researching, assessing and adapting space, place and technologies to enable participation in workplaces by eliminating or transforming barriers, perhaps through flexible work arrangements, in order to 'negotiate a very difficult world out there' (Participant 2).

Disabled people have had, and continue to have, difficulties in finding, obtaining and progressing in employment and I do not claim to solve this historic dilemma of disability and its difficult relationship with worthwhile employment. The research only claims to bring an alternative and modest insight into the work practices of knowledge-workers with mobility impairments in the twenty-first-century workplace, characterised by uncertainty and a changed understanding of the 'geographies of disability' therein (Gleeson, 1999).

### 1.4 STRUCTURE OF THE THESIS

In terms of the processes that led to my findings, I created a matrix to plan all aspects of the research as a project with distinct sections and sub-goals. In order to create a

text for analysis out of the transcriptions of observations and discussions in my study, I created a main database from which categories, then themes, were used together with theory, to build on prior research. Finally, I then analysed and synthesised the themes into a broader interpretation.

Chapter 1, the current chapter, has briefly surveyed the background, situating the study in a context of employment, modes of employment and current policy. I have briefly outlined the research design and methodology, the sample of participants, use of theory and set out the rationale as to why this research is worthwhile. I have also presented the research questions.

Chapter 2, the Literature review, identifies the gap for this study. I review literature of affordance research, disability research and to some extent, practice and phenomenological research that is appropriate to my own empirical work. From this gap, I designed the research questions.

Chapter 3 is the Methodology chapter which outlines the research strategy, alternative possible strategies, and sampling. It also explains how the research questions gave rise to the choice of methodology in use. I also address particular issues of ethics and rigour, as both remained a major consideration throughout the research process, to the very end.

Chapter 4 is the Findings chapter and consists solely of evidence with brief explanatory paragraphs describing six themes which emerged from the data gathered.

Chapter 5 is the Discussion chapter which links the same six themes to prior research and then synthesises my interpretations.

Chapter 6 is the Conclusion in which I lay out the key findings, the limitations and ideas for further research.

# CHAPTER 2 - LITERATURE REVIEW

## 2.1 OVERVIEW OF THIS CHAPTER

### 2.1.1 Structure of the chapter

The purpose of reviewing the literature, as well as foundational primary sources, is to identify a gap in research knowledge for this project and to arrive at its research questions (Schwartz-Shea & Yanow, 2012; Trowler, 2012d; Wallace & Wray, 2006). The main bodies of literature included are disability vis-à-vis employment, affordances and a phenomenological understanding of space. I am also using this section to include a review not only of prior empirical research, but also of theory I use.

### 2.1.2 Consequences of making selections

The literature included has been selected for its relevance in answering the research questions. Disability, technology and phenomenology are very large bodies of knowledge and I have concentrated on particular areas subsumed by all three. Being selective automatically implies that other areas may well have been occluded either by design or inadvertently. Kvale and Brinkmann (2009) point out that data analysis starts during data collection and, in a similar way, observations and discussions also directed and redirected the literature search. At different times, different aspects of the project were foregrounded and even in the final stages of writing up the work, new elements came to light that needed to be addressed, meanings checked and findings reconsidered (for example, 'non-affordances' and the metacognitive processes in non-formal learning).

### 2.1.3 Keeping up-to-date

I used the library facilities to reference books through their postal service and made use of the library's online guides for students on keeping abreast of new literature, in particular, the library video, 'Keeping up to Date' by Brine (2012). A major strategy has been to use other writers' bibliographies to signpost me to further literature. To keep abreast of current research, I used online databases to access peer-reviewed academic journals. Following the way in which Fenwick (2008) describes her literature review of work-based learning, I now outline how and where the literature was sourced and how it was subsequently managed.

Through the university library website, I used the EBSCO family of databases to source current research in the field. This was done in various ways, to mine the different databases for articles in peer-reviewed journals based on search terms. I downloaded required articles, saved them immediately by author name and title in a digital folder, downloaded the citation into Endnote 6 and printed the articles for reading at a later date. A small percentage of articles was read and (mostly) summarised but clearly marked 'not for use' where I had doubts about one or another aspect concerning the rigour of the article. I engaged my 'commensurability check' as an ongoing enterprise (particularly with regard to medicalised or scientific articles on disability).

### 2.1.4 Academic publishers - alerts by email

I registered with various academic publishers, providing search terms for search and citation alerts to be emailed (see *Appendix 1*). I also registered with JournalTOCS[7] to obtain TOC (table of content) alerts. I used search criteria such as: 'affordances and

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[7]. [7] http://www.journaltocs.hw.ac.uk/

flexible working', 'affordances or disability', 'technology or learning', 'technology and disability *and* technology and affordances'. As the emphasis of the study subtly changed over the course of the research, I updated the search terms a number of times. One way of keeping up-to-date with seminars was through online forums through the Jiscmail[8] 'Disability-Research Discussion List'. I was able to attend three useful seminars on aspects of disability research which were advertised through these forums - one on intersectionality and disability, one on disability and 'high-flyers' and one on the Americans with Disabilities Act, 25 years on. I also followed key academic writers in the field through Academia.edu and made contacts through this website to ask particular questions of different experts, and to check my understandings, particularly of hermeneutic phenomenology. I used 'grey literature' with caution and for background information only, mostly in the form of government and charities' reports to keep abreast of the disability policy landscape. I also subscribed to a few blogs and online disability magazines.

### 2.1.5 Managing the incoming literature

I did not anticipate the overwhelming volume of literature which I would be summarising and then filtering, for use at a later stage. The volume of articles read remained the biggest logistical problem of the entire research project. I filled ten notebooks, each page numbered sequentially by notebook from A to J (pages1 - 75) and indexed (see *Appendix 2*). When an article had been read and summarised it was then filed into one of eight lever-arch files and cross-referenced to the notebook page. A colleague created a Microsoft Access database to manage the literature summarised in these notebooks (see *Appendix 3*). I then assigned key words to every page of every

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[8] www.jiscmail.ac.uk

notebook and entered these keywords with their page references into a table. This way, any keyword or author could be selected when writing this work.

## 2.1.6 Choices of prior research and theory

The choice of literature and theory included in this section is not simply a list of main perspectives in the different pertinent areas – the selection is clearly influenced by the epistemic conversations one chooses to join (Schwartz-Shea & Yanow, 2012). This also reflects Wenger's (2011) interesting questioning of the research process: 'what kind of story do you wish to tell?' Heidegger's (1953, p. 4)[9] way of expressing this elevates this question to a philosophical level and reminds us that when asking questions in the realm of social inquiry, we are already in some way anticipating the answers:

> Every questioning is a seeking. Every seeking takes its lead beforehand from what is sought. Questioning is a knowing search for beings in their thatness and whatness.

What is actively sought is prior empirical research and theoretical positions, through which to interpret the data collected and analysed in the process of operationalising the research.

Using theory as lenses for interpretation requires critical questioning of it and its propositions, as well as questioning of its orthodoxies – particularly, in this study, disability theory (Mingers, 2000). One needs a good and solid understanding of a broad body of the literature in order to make selections from it – in other words, one needs to be 'theoretically literate' (Tight 2004, p. 407). I do not maintain that one has to agree with every aspect of a primary text, but in order to disagree, one needs to first

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[9] REFLECTIVE NOTE: I prefer this translation to the one of Being and Time I use everywhere else (the Macquarrie translation of 1962).

fully understand the reasoning behind it (also Petrovskaya (2014)). Nor would I wish to 'recycle' (Paley, 2014, p. 1523) misunderstandings of Heidegger's hermeneutic phenomenology or Gibson's affordance theory, in particular, which could adversely affect any interpretation of their theories. While theory provides valuable scaffolding for the entire study and enables connections to broader concerns, findings can nevertheless only ever be partial, provisional and tentative (Bennett & M. Oliver, 2011; Finlay, 2011).

This is a study about the multivalent meanings of the usability of space, place and objects and I use various commensurate, compatible theoretical perspectives, fully aware that theory infuses all aspects of the research (Trowler, 2012b). Pre-suppositions and understandings (not only of data, but also of theory) are not formed in a vacuum. Rather,

> Theory is the way we capture meanings that are already there in the practical world (Lavoie, 2011, p. 119).

Theory has a particular and clear purpose in this study: lenses through which to view, guide and subsequently interpret. Theory is not being used to test, nor to prove, nor to impose itself onto words of participants, nor to massage findings to confirm it (Willis, 2001). Most specifically, it is not being used 'as a frame into which data is shoved' (Trowler, 2012b).

At different times in the research, at different levels, different theoretical positions foreground different aspects of the research, as I 'zoom' (Nicolini, 2009, p. 1391) in and out of disparate theoretical (but commensurate) lenses to guide, explain and contextualise the data (Trowler, 2012b). This is done as I 're-imagine' (Trowler, 2012c, p. 277) what I might have taken for granted, be it as it pertains to technology,

disability or work, to gain a better understanding of the phenomena. Imagination, as part of a social learning process, is not only something I observe in my participants' actions as they engage with and learn in their communities of practice (Wenger, 1998). Imagination is also something engaged in my *own* practice as a researcher using theory to perhaps 'see afresh' (Finlay, 2009).

Even if 'each perspective is itself a slippery, heterogeneous and contested site of inquiry' (Fenwick, 2010), the value of zooming is to bring into focus aspects of the study which may be occluded at times – especially taken-for-granted understandings. As Goodley, Hughes, and Davis (2012, p.2) remind the researcher:

> When social theory works at its best, it demands us to reconsider the assumptions, discourses and taken-for-granted ideologies that undergird the exclusion of some people …

## 2.1.7 Taken-for-granted assumptions in theory

Such reviewing of taken-for-granted understandings, assumptions and presuppositions, including of theory, is a recurrent thread throughout the study. The phenomena as seen were not in the least bit anticipated, leading pre-understandings to change from expectations of barriers in workplaces to a phenomenological understanding of social space. Moreover, the taken-for-granted view of disability as acceptable exclusion of people (as in Titchkosky (2011)) links to the taken-for-granted (and unreflected-upon) nature of technology in Heidegger's major work, *Being and Time* (1962), an important guide in my interpretations of the phenomena. According to Leonardi (2011), from an organisational work practice perspective, practices and procedures also become unreflected-upon or 'black-boxed' as human and material agencies become interlinked in habituated, routinised practice. Such routines become

naturalised where people draw on experience to produce, sustain or change practice or technologies.

In critically examining presuppositions, through a process of 'reflection- upon-action' (Schön, 1983), I considered various perspectives in socio-material theory before re-evaluating J. J. Gibson's (1986) original conceptualisation of affordance theory (which I had previously discarded as 'too positivistic', based erroneously on his early psychological experiments on visual perception).

Having outlined the basis of the literature review, Section 2.2 below reviews literature in the field of disability and employment options for managerial-level disabled workers.

## 2.2. DISABILITY AND BEING-IN-THE-WORLD

### 2.2.1 Disability theory: The social barriers model

The 'orthodox' social model of disability is predicated on barriers, physical and attitudinal, facing people with impairments. People's individual impairments are not the barrier to social inclusion in this view. There are comprehensive critiques of this social model elsewhere, for example, Tremain (2005), Roulstone (1998, 2012), Crow (1996), Freund (2001), Paterson and Hughes (1999), Shakespeare (1994), Shildrick (2009), Terzi (2004), C. Thomas (2002), and Vehmas (2012).

The social barriers model builds on the orthodox model. This version views the benefits afforded by technology as inhering in their potential to challenge barriers of different types in workplaces. Roulstone's (1998) research shows how disability and work can be empirically researchable with *individuals* and their *embodied* experience of work (to disclose the barriers). In a study of 78 people with disabilities using

technology at work, all answering questionnaires about their use of technology at work, Roulstone (1998) found that the majority of respondents viewed technology positively in respect of its ability to counteract barriers. Thirty of these respondents then took part in the next qualitative phase of the research. Configured barriers, often 'interacting barriers' (Roulstone, 1998, p. 126) and the primacy of attitudinal barriers, found in this research, are also to be seen in my study. This study, like mine, shows how a social (barriers) approach can be studied through *individual* people's understandings to give a fuller, more complex understanding of disability and the workplace. This became a major work influencing the course of my empirical work[10].

When such interacting barriers (in my study, physical mixed with attitudinal barriers) became evident in the discussion with the first participant, I immediately became aware of taken-for-granted understandings that act as barriers and to which Titchkosky (2011) refers[11].

In the past I have accepted the tenets of the social model of disability unquestionably but have come to a realisation that theory itself can also become naturalised and taken-for-granted and ought to be questioned as a matter of rigour. An awareness of this has led me to question how impairment and embodiment can be excluded from the social model of disability. In Crow's (1996, p. 58) view, 'impairment is safer not mentioned at all' in this model. Tremain (2005) correctly points out, in her critique of the logic of the model, that only people with *impairments* can be described as being *disabled* at all. Related to this, if embodiment is absent, Marks (1999) validly questions how people with impairments can have a voice at all if there is no body. Examining taken-

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10 REFLECTIVE NOTE: How to upscale the findings from an individual to a social level remains a puzzle and perhaps one best thought of in terms of both new methodologies needed (as in Law and Urry (2004) and also in Schatzki (2014, 2015) on scale.)

[11] REFLECTIVE NOTE: And I realised that a phenomenological approach would be the correct one to look for such taken-for-granted understandings.

for-granted understandings of theory can perhaps also enliven discussions about it, especially when 'orthodox' social model proponents like M.J. Oliver and Barnes (2011, p. 575) themselves refer to a 'stagnating disability studies'.

## 2.2.2 Taken-for-granted phenomenological understanding of disability

One important contribution of phenomenology to disability theory is the way that exclusion of people, in everyday practice, is unnoticed and un-reflected upon (Titchkosky, 2008, 2011; Titchkosky & Michalko, 2012). In this way, the lack of access:

> is naturalised to such an extent that even when barriers and processes of exclusion are noticed, they are still conceived as somehow natural, reasonable, sensible and even seemingly justifiable (Titchkosky, 2011, p. xi).

In this view, embodied difference is devalued to the point that some people are seen as excludable types (Titchkosky, 2011). What becomes particularly naturalised is the unquestioned status of disability framed as a problem in terms of what counts as 'normal'. Titchkosky's (2011) book, which is 'a politics of space, belonging and personhood that questions our fundamental encounters with one another' (Roulstone, 2014) treats relations in space as phenomena for analysis. I consider this phenomenological understanding of disability and space as aligning well with different models of disability for the reason that taken-for-grantedness is a view not only between individuals but also pervades social, legal and institutional life.

In the view of Titchkosky and Michalko (2012, p. 129), 'the world comes to us and we receive it always already framed'. This resonates with Heidegger's (1962) fundamental phenomenological position that we come to a world full of pre-understood meanings. The challenge for a phenomenological view of disability is to reveal the taken-for-granted meanings that entrench, naturalise and exclude

(Berndtsson, Claesson, Friberg, & Öhlén, 2007). This means interrogating the 'bodily choreography' (Nicolini, 2012, p. 220) of equipped practice to which Heidegger refers.

Paterson and Hughes (1999, p. 604) take the view that 'exclusion, even oppression, is a kind of homelessness' – that anyone excluded this way could not find meaning in participation, or, *'being-in-the-world'* (Heidegger, 1962). Their view is that the social model is over-socialised and disembodied, while they acknowledge that phenomenological approaches tend to be under-socialised (and often criticised as being 'subjective'). They recommend a fusion of the two to make impairment social and disability embodied, as a 'post-Cartesian and radical perspective' (Paterson & Hughes, 1999, p. 598) and this is the direction that my work has taken.

In order to find out more about social inclusion in workplaces, I now briefly examine modes of employment for managerial-level disabled workers and end this section with research concerning wheelchair users.

### 2.2.3 Disabled management-level employees

Under-employment, sometimes referred to as a 'glass ceiling', refers to the lost opportunities for people whose skills and abilities are not used to the full and who are therefore not participating optimally (Harris, 2010; Harris & Thornton, 2005). Roulstone and Williams (2013) conducted research with 42 managers with disabilities and found that promotional mobility was indeed a barrier to these managers. A similar study interviewing disabled professional workers found that barriers to promotion existed for workers with mobility impairments (Wilson-Kovacs, Ryan, Haslam, & Rabinovich, 2008). In a mixed-methods study investigating mobility impairments and the construction of a disabled identity, Ridolfo and Ward (2013) found that many

people did not identify as disabled because they were acutely aware of the stigmatising effects of having a 'disabled' label. Ridolfo and Ward also acknowledge the intersectional nature of disability (race, gender, social class, educational and economic status, for example) as being more significant than the mobility impairment that made their participants claim a disabled identity. (Since the social model of disability does not acknowledge individual impairments, it also thereby does not acknowledge the intersectional character of disability which is yet another taken-for-granted theoretical position, in my view.)

## 2.2.4 Disabled self-employed workers

One mode of employment is self-employment. In my study, three participants employ 27 other workers between them in the course of running their businesses. I found no prior research at all on disabled employers of workers other than carers.

The term 'entrepreneurship' is frequently conflated with the term 'self-employment' which, in a comprehensive literature review on this topic, Parker Harris, Caldwell, and Renko (2014) contend, are two different concepts, and misunderstandings (and misuse) of these terms leads to questionable statistics (and subsequent policy decisions) for understanding employment. They consider that entrepreneurship is concerned with innovation and risk-taking, with self-employment being traditional employment but for oneself, not for employing others (discussed also by Hwang and Roulstone (2015)). The Organisation for Economic Co-operation and Development (OECD, 2015) recognises the polysemy of the term 'entrepreneur' and the problems it invites. As Sanandaji and Sanandaji (2014) suggest, by conflating the terms entrepreneurship and self-employment, policy decisions which encourage self-employment do not necessarily promote entrepreneurship. As they point out, these are

two different sectors of the economy, both important, but should be treated differently (by researchers as well as by policy-makers). Nevertheless, in a mixed-methods study on the barriers to self-employment for people with disabilities, Boylan and Burchardt (2003, p. 3) concluded broadly that barriers to start-ups for disabled people considering the self-employment route included difficulties in obtaining start-up capital, unsupportive business advisors, insufficient training and also fear of losing benefits. Fear of losing benefits as a factor in choosing the self-employed route is something also discussed by Pagán (2009) and Drakopolou-Dodd (2015), while Cooney (2008, p. 126) claims that the reasons for choosing the self-employed option are 'heavily rooted in negative motives'. My questioning of these negative views of self-employment concerns the taken-for-granted low expectations of people's ability to start, manage and sustain a business venture at all, because it presupposes that the venture will not be able to generate an income at least as good as benefit receipts. This is based on the assertion that 'self-employment generates significantly less income for disabled than non-disabled people' (Boylan & Burchardt, 2003, p. 5). Ironically, this is oppositional to the spirit of entrepreneurialism (as understood in organisational and management studies as risk-taking), which Anderson and Galloway (2012, p. 94) define as 'independent venture creation or self-employment'. It also takes for granted that self-employment is a poor substitute for paid employment which, while it may be true for some people, is not true for all.

Boylan and Burchardt (2003) contend that educational qualifications are a determinant of income in self-employment and, as such, those with lower qualifications (a higher proportion of disabled than non-disabled self-employed people) are therefore further

disadvantaged[12]. Hence Anderson and Galloway (2012) take the view that training is needed to teach people the skills to run businesses, while Drakopolou-Dodd (2015) takes the view that one-to-one support and outreach programmes are needed to support such workers. The problem with this, according to Piggott, Sapey and Wilenius (2005), is that it reinforces the issue as a problem located in solutions for individuals when it is a social, rather than an individual, issue. The problem for me, however, is that this latter assumption that one should be addressing social, not individual problems (a social model approach) is as incomplete an approach as the individual (medicalised/rehabilitative) views of disability that they criticise. (To overcome this difficulty in small-scale research, I have to view the intersectional factors as individual and situated, and I have to conceptualise the 'social' as an aggregation of diverse, heterogeneous individuals.)

This brief discussion of modes of employment for disabled people led to looking for current research on wheelchair-users.

## 2.2.5 Wheelchair-users

Studies of wheelchair use are varied in methodology, purpose and paradigm with most studies of a rehabilitation/medical nature. The lack of phenomenological-type research pointed to an early gap for this project. In an inaugural professorial lecture, M.J.Oliver (1993, p. 9) chose to discuss walking and 'nearly-walking' as culturally symbolic acts and spoke about the ways in which rehabilitation professionals contribute to the negative views of non-walking (as they attempt to repair and control what they see as

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[12] REFLECTIVE NOTE: Participant 4 (P4) told me that in his view, the single most important factor – for both disabled and non-disabled people – in creating, maintaining and progressing in professional life was a good education. In his case, he said that this compensated to a very large extent for the immobility caused by his spinal cord injury.

a problem). This is a view of walking seen in terms of social justice and confirmed in the historical work of D. Wilson (2005) who has documented the history of polio in America. Nevertheless, he does point to polio survivors who, having decided to use adaptive devices, then successfully fit in with social life:

> By confronting the cultural stigma associated with these devices (braces and wheelchairs) and, by in some sense, embracing these mechanical 'friends', polio survivors compensated for their paralyzed bodies and became functional in the wider world of home, school and work.

In a study of 243 polio survivors in Norway, Farbu, Rekand, Aarli, and Gilhus (2001) found that their educational levels, employment opportunities and professional lives did not differ from those of the general population and that the participants were well integrated into social Norwegian work and home life. Nearly 20% of these participants had academic careers. What could be questioned in these data is that only four of these participants used wheelchairs 'intermittently' (despite 17 of the participants having 'extensive' leg and arm paralysis) and none appeared to use wheelchairs on a permanent basis. This finding is contradicted by Groce, Banks, and Stein (2014), whose literature review on post-polio survivors globally points to 60-90% of polio survivors suffering from varying degrees of paralysis. Also contradictory to the Norwegian study is their finding that many of the 20 million polio survivors (many aged 60 years and above now) are people impoverished and lacking in education.

In a qualitative study of 121 people with *both* visual and mobility impairments and all being wheelchair-users, it was found that obstacles in the built environment meant, for these participants, inequality of provision of public services, particularly in transport, that were considered barriers to inclusion in social life (Gallagher, Hart, O'Brien, Stevenson, & Jackson, 2011). Sapey, Stewart, and Donaldson (2005) conducted a

survey of 1,226 wheelchair-users to investigate the large increases in the numbers of wheelchair users in the UK and found that the rise came from changed prescription practice, medical advances and changing attitudes to disablement.

Three studies about wheelchair usage draw on similar data to mine, but employ completely different methodologies and theoretical lenses. Therefore, they explicate the data differently and, unsurprisingly, arrive at different results. Firstly, in a study of one participant with a spinal cord injury who needed ventilation equipment, using Foucauldian insights, Moser (2006, p. 383) concluded that the purpose of technology was negative and played an exclusionary role in a process of trying to transform disabled people into 'normal subjects'. Then, in a second study of wheelchair use, I did not understand the interpretation of a writer who used an actor-network theory (ANT) perspective (although claiming to be taking insights from phenomenology, which it did not), and who explicated wheelchair use as relational in the mutual shaping of human and non-human entities (Winance, 2006). The third study is an anthropological study in America, using an ethnographic methodology to trace the body-histories of 21 participants who had contracted childhood polio (and who were, at the time of the research, by and large, retired people) (McGowan, 2005). This study divided the sample into 'uprights' and 'sit-downs' referring to participants who walked or had walked and participants who were wheelchair-users and their different histories and understandings of mobility impairments. This study found that socio-cultural events in the participants' histories (particularly the Civil Rights movement and the Vietnam war) had impacts on wheelchair users' lives.

What is interesting about these three studies is that many examples in the data are similar to data which I collected, but interpreted very differently, firstly because of

diverse methodologies and their underpinnings, secondly, through different further

theoretical positions, and thirdly, through different research questions and foci.[13] All

three of these studies reminded me that even when similar data are used, the

methodologies may indeed be as performative (thereby creating realities) in the

research process as Law and Urry (2004) theorise.

Having reviewed literature on the modes of employment and wheelchair users, and

having begun the empirical work, the study was becoming increasingly one focusing

on the usabilty of space, place and objects. Section 2.3 below reviews the affordance

theory of J. J. Gibson (1986) as a theory of 'use potential'. My interest is focused on

the information that is learned in practice, to guide people's actions in practice when

space, place or objects are unusable.

## 2.3 AFFORDANCES OF SPACE, PLACE AND OBJECTS IN PRACTICE

### 2.3.1 Affordance theory

In her literature review of the 'contested ontologies' of affordances, Parchoma (2014,

p. 367) summarises, compares and critiques the different revisions of Gibson's

original theory and challenges the reader to undertake cross-disciplinary empirical

studies to contribute to 'a more nuanced understanding' of affordances in socio-

material practice. She draws attention to the varied, often incommensurate, ways in

which the term has transmuted from Gibson's original meaning into quite different

meanings. J.J. Gibson's (1986) original meaning of an affordance is, quite simply, the

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[13] REFLECTIVE NOTE: And, I suspect, how different researchers have their own presuppositions and questions which, as Heidegger (1962) says, are already in the realm of where the answer lies when we ask those questions.

perception of the *use-potential* of an object, place or event. This is also the way that Sanders (1997) and Treem and Leonardi (2012) use the term.

J. J. Gibson (1986) created the neologism 'affordance' to overcome the Cartesian subject/object duality as a bridge to link both through the 'environment'. He gives an example of what an affordance *is*, through what a post-box *does*: it offers a *potential use* for a person (the subject) posting a letter (the object) to be sent through 'a community with a postal system' (J.J. Gibson, 1986, p. 139). This recognition of 'community' and 'postal system' is what distances Gibson from the Cartesian duality of subject and object, bridged by the discursive arena of 'postal system'. The potential use of the post-box for the user does not depend on the qualities of the post-box (brick and metal), but on its perceived use in a process of participating in a social practice (posting a tax return, birthday card or job application, for example). This potential for use is expressed as follows:

> The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill .… It implies the complementarity of the animal and the environment (J. J. Gibson, 1986, p. 127).

In Gibson's (1986, p. 134) view (and I believe that this is not from an 'objective' standpoint on Gibson's part):

> what we perceive when we look at objects are their affordances, not their qualities.

Nevertheless his work has been criticised for being positivistic (for example, Chemero (2003)) since it was based on his wartime experiments in the United States Air Force and subsequent academic research, some of which was with his wife, also an academic psychologist like Gibson himself. His early research, leading up to the formulation of this affordance theory, involved mostly studies pertaining to surface

perception: edges of surfaces, layout of surfaces, motion of surfaces and the perception of impending collisions with surfaces (both birds and Air Force pilots) (J. J. Gibson, 1967).

J. J. Gibson (1967, p. 140), in talking about his early work, clarifies what is not that clear in all of his work:

> These experiments are not concerned any more with the perception of space, but with the perception of the features of the world, the furniture of the environment and what they afford.

Jones (2003) contends that Gibson's thinking developed over decades and was always in a state of flux, hence the anomalies in interpretation. In the example of the post-box, what we perceive is the *potential use* for the sender in the activity of posting a letter, for a particular discursive purpose and, therefore, in context. The potential for use is also expressed by Latour (2002, p. 250) as:

> those who believe that tools are simple utensils have never held a hammer in their hand, have never allowed themselves to recognise the flux of possibilities that they are suddenly able to envisage.

For empirical purposes and to make the term usable (and useful), this means that what people are looking at, is whether a road surface may be slippery, wet, uneven, cobbled or bumpy – these are not objective properties of the road, but *information* about the road (and this information, in the case of the participants in this study, has a material impact on *how* they cross this road). From this information, people learn to make the choices available to them (possibly by changing practice, or changing the technology) (E. J. Gibson et al., 1987; E. J. Gibson & Schmuckler, 1989; Leonardi, 2011, 2013b). Making the term useful in this way for research purposes contradicts Chemero's (2003, p. 182) view that affordances are nothing but 'impossible, ghostly entities' that

have no analytical purpose, or M. Oliver's (2005) view that the term is so misused (I agree) that it should be abandoned altogether. I interpret Chemero's statement to be based on Gibson's (1979, p. 129) claims that affordances are 'both physical and psychical, yet neither'. Again, I see this as Gibson's attempt to bridge the Cartesian duality of mind and body (rather than interpret 'psychical' as being a 'ghostly' entity – and possibly misunderstood by Chemero).

Despite criticisms of the term and its meaning, I find resonances with a phenomenological leaning in Gibson's work, as does Dohn (2006). Even though Robey and Boudreau (1999) question how effectively one can recognise affordances for the purposes of empirical work, Parchoma (2014) and Conole (2013) suggest ways of looking for the *in situ* enablers, restrictors and regulators very effectively, and in contrast to Hutchby (2001), who sees affordances in terms of setting limits on what it is possible to do with objects. Treem and Leonardi (2012), also using Gibson's original meaning of the term, and looking simply at the utility of social media, very usefully tabulate the observed affordances of different media used by their participants. In other work, Leonardi (2013b) and Treem and Leonardi (2012) do the same through an affordance perspective, but their view tends to be that technologies do have material limits that may or may not be flexible, in which case, affordances may be negative to particular users (as discussed by, for example, Leonardi (2011)).

Questioning the usefulness of the term for empirical work correctly reminds the reader that various revisions of the theory are not commensurable or compatible with each other and that variations in definitions of the term impact its analytic integrity, thus making it the contested issue it is (Parchoma, 2014). Debates about the meaning of the term also reveal how far it has moved from its original one, as posited by Gibson (Bloomfield, Latham, & Vurdubakis, 2010; Parchoma, 2014). Furthermore, different

disciplines use the term differently (Bloomfield et. al., 2010). Not only that, but the term has become naturalised ('black-boxed') and unquestioned. As a result, M. Oliver (2013, p. 38) has criticised theories based on affordances, saying that many have no relation to Gibson's original ideas (although his own version interprets affordances to be synonymous with 'properties', which is not Gibson's meaning). Some versions emphasise the social over the material. In Bloomfield, Latham and Vurdubakis's (2010) research with disabled participants and their use of technology, they view affordances from a sociological viewpoint tied to embodied social and cultural ways of life (also discussed by Schmidt (2007)).

E.J. Gibson (2000, 2002) and E.J. Gibson et al. (1987) considered that learning, through finding the information that guide the actions from perceived affordances, is a basic component of affordance theory. This became a focus of my research, because, when space, place and objects showed up as having negative, unusable affordances, participants then actively engaged by learning how to make them positive and therefore, usable.

## 2.3.2 Information and affordances, *learned* in practice

One way of taking up Parchoma's (2014, p. 367) challenge to making the term empirically useful in 'knowledge production activities' is to look for the information which informs people's subsequent actions and what they know.

I focus on J. J. Gibson's and, particularly, E. J. Gibson's emphasis on the information in the environment that guides people (possibly thought of as 'subjects') to use the material 'object' in practice. Perhaps this is why Conole (2013, p. 87) says that 'for Gibson, affordances are binary. They either exist or they do not.' For Gibson, perception entails movement and is an active and embodied process of 'information

pickup' (Ingold, 2000, p. 166). This 'pickup of the information' or 'stimulus-information' (J. J. Gibson, 1986, p. 135) also informed E. J. Gibson's work, as she actively sought to 'uncover the information that specifies what we perceive' (E. J. Gibson, 2000, p. 55). This information is needed to guide actions to use the object (E. J. Gibson & Schmuckler, 1989). Detecting this 'stimulus-information' in the landscape is partly learned through the consequences of one's own activities and experience.

Eraut's (2009, p. 2) work on 'non-formal' learning in workplaces focuses on how professionals, in their journeys to becoming competent workers, learn by 'doing things better', 'doing things differently' and 'doing different things'. This kind of learning, observed and discussed with the participants in my study, focuses on how people take the information for affordances and - from past experience, current understandings and future projections – make adaptations to either practice or technology. As E. J. Gibson (2000) advises (from her research on how babies learn affordances), in order to study affordances, we must first find out where in the environment the information is, what is learned and how people use this information to guide their actions. The potential for use is also about learning how to use the affordances (Dohn, 2006).

J. J. Gibson (1986, p. 141) saw as 'misperceived' affordances, the understanding of babies when confronted with a glass surface for crossing (the 'visual cliff'). Some babies would pat the glass, but not cross it. While I respectfully question Gibson's interpretation of his own work, my interpretation of this is not as a misperception of the affordance (to cross), but as the baby *lacking the information* needed from the

environment, that is, *that it is safe to cross*[14]. As such, using Gibson's own theory, it is possible to interpret this as a negative affordance (until learning that it is safe to cross, making the glass bridge a positive affordance for crossing). In other experiments with babies, E. J. Gibson tried to coax babies over a four-foot-high bridge of various types to a waiting parent on the other side. While I question why this research did not explicitly examine the role of the parents *encouraging* their babies to cross, the babies nevertheless, in the two minutes they were allotted, showed that they used the *information* to cross or not cross - thus learning that it was safe to cross (that is, that there were positive affordances), or deciding (and showing early signs of learned human agency) that they were not going to cross due to perceived negative affordances (E. J. Gibson et al., 1987; E. J. Gibson & Schmuckler, 1989).

### 2.3.3 Information and affordances, *used* in practice

Affordances have been studied in organisational settings, linking people, digital technologies and features of organisational life (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). The way that Treem and Leonardi (2012) study affordances in organisations is to identify different types of affordances enabled by the technologies and then to describe the ways that people use the material features of technologies. Treem and Leonardi (2012) are particularly interested in the way that digital artefacts can be said to be material at all and propose using a human agency perspective, coupled with affordances, to deal with the technologies of the digital age. Their position on technology is that material features place limits on the kinds of adaptations and modifications people can make to technology. Similarly, Pentland and Feldman (2008) point out that one cannot turn a toaster into a mobile telephone; also,

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[14] REFLECTIVE NOTE: I was encouraged in making this statement by Trowler (2012b) - that there is room to challenge eminent theorists and not to slavishly 'ventriloquate' every aspect of their work.

Lachmann (1978) points out that one cannot turn a beer barrel into a blast furnace (since they have different uses). Leonardi's (2013b, p. 750) position, from an organisational perspective, is that people's goals are seen as the primary driver of either change of technology or of practice, and his work has led him to ask whether there are 'shared affordances' in communities of practice where people have shared goals. While his focus is on human agency in their goal-making decisions, his work looks at affordances of technology in achieving these goals. Leonardi (2013b, p. 750) also recognises the learning that inheres in the information about affordances for the actions people take. His (Leonardi, 2011, p. 151) research led him to develop his view of materiality: that human and non-human agency is 'imbricated', or interlocked in particular sequences (not random) in practice. This process produces, sustains or changes either technology or practice, as the affordances appear negative or positive to the users, in a 'synergistic interaction' of material and human agencies. In an ethnographic study interviewing managers and senior engineers using simulation auto-crash software in the United States, he focused on human and material agency (that is, human goal-driven behaviour and the performativity of software to act independently of human intervention) to explain technology-in-practice. His position is that when technology is inflexible, people may have to change practice in manoeuvring around the present-at-hand status of it. Alternatively, if technology is flexible (for example, customisable), then it could be changed. If technology is inflexible, then people may use it for purposes other than those originally intended or in ways not anticipated by the original designers. In an extreme example of this, Pentland and Feldman (2008, p. 243) cite 'cellphones for bomb detonators'. Even with constraints, people may still need to use the technology as originally intended (Robey & Boudreau, 1999).

Leonardi's (2011) view of using affordances is different from Orlikowski's, who views 'socio-materiality' as the 'constitutive entanglement' of the human and material (Feldman & Orlikowski, 2011; Orlikowski, 2005, 2007, 2008). This view is predicated on the recursive relationship between the social and the material, in which Orlikowski theorises that practice and materiality do not exist without each other (also discussed by Schatzki, 2015). This was criticised by Mutch (2013) on the grounds that it is vague about technology and ignores social structure. In the lively rebuttal that ensued, Scott and Orlikowski (2013) argue that Mutch neither understood the 'entanglement' model nor acknowledged the importance of a plurality of perspectives about technology use. Leonardi (2013a), and in support of Mutch, has listed the differences ontologically and epistemologically between his model and Orlikowski's, and there are basic differences, but for the purposes of my work, what is important is that Orlikowski highlights the co-constitutive elements of socio-materiality while Leonardi highlights agency as goal-directed (organisational) intentionality in socio-material arrangements of practices that emerge in imbricated patterns. Both views are valid for my work, despite differences between them, since both research distributed workplaces and distributed practice, and both have used affordance theory empirically to explain the relationship between technology and humans in the course of work practices.

What is particularly useful for my empirical work is the way Orlikowski uses affordances to look for the information that guides direction in organisations ('knowing-in-practice') and her studies have involved professional and other high-level staff and their use of technology at work (Orlikowski, 2002, 2005, 2007). Similarly, Leonardi has used affordance theory to investigate how high-level

management staff use hardware and software in workplaces (Bailey, Leonardi, & Chong, 2009; Leonardi, 2013b; Treem & Leonardi, 2012).

### 2.3.4. Affordances, identity and learning

Leonardi's work in the automotive industry clearly shows that placing participants in non-formal learning situations (focus groups, training sessions, staff meetings, best-practice lists, iterative discussions about what worked, tests, talks with others, 'brainstorming', etc.) led to the learning of the affordance to achieve, through mutual engagement, shared resources and in joint enterprise, the common goals of the workplace (Billett, 2004; Cook & Yanow, 1993; Wenger, 1998). Since affordances are multiple for different users (Leonardi, 2011), it follows logically that different members of communities of practice - from the newcomer to the experienced professional - will, as they learn through experience in the practice, experience affordances differently at different times. As people learn to become competent members of the practice, their identities change: what they know is linked to what they do and who they become (Wenger-Trayner et al., 2015; Wenger, 2010). Similarly, E. J. Gibson's (2002, p. 134) view of how affordances are linked to identity is as follows:

> We act on our affordances and these play a large role in determining not only our life histories, but the kind of people we become.

Although J. J. Gibson (1986, p. 141) does theorise that the information about affordances is how we 'learn to perceive the affordances' (which I was able to see in the observations and discussions with participants, as the data below will show), the learning aspect was taken-for-granted in Gibson's work and in my view, that is probably why it has not been an emphasis of affordance theory. Nevertheless,

according to E. J. Gibson (2002, p. 96), it was *always* part of J.J. Gibson's theory and she quotes her husband as saying that learning is all-important for affordances.

## 2.3.5 Looking for the learning in workplaces

Fenwick (2008, p. 228) reviewed the literature of workplace learning and found that it is best understood as the 'capacity for more sophisticated, more flexible and more creative action'. Billett (2004) also sees workplace learning in terms of individual goal-directed behaviours as people assess the affordances they face and act accordingly by engaging 'metacognitive experiences' (as discussed in Flavell (1979, p. 906)), to solve problems.

Studying knowing-in-practice has been a focus of Orlikowski (2002), who outlines the practice, lists the activities of it and then specifies the knowing constituted in that practice. This method of studying what is learned in non-formal workplace learning aligns well with a phenomenological approach and also the work of J.S. Brown and Duguid (1991), who view organisational learning as the bridge between working and innovation. Both of these ways of looking for the learning and knowing in practice work well for empirically studying the learning in practice. Wenger's work reflects a move away from the apprenticeship model of his early work on situated learning to one that links the epistemology of practice to the ontology of a person's identity (what one knows changes who one is) in communities of practice (Wenger-Trayner et al., 2015; Wenger, 2000, 2009, 2010). Learning in this view does not take place in individual minds, but in the 'social learning system' of communities of practice, where competence comes about as participants traverse the landscape (from novice to experienced practitioner), learning from and with others, in the joint enterprise, using shared resources, understandings and language, in order to *become* (a competent

member) (Wenger, 1998). Clegg, Kornberger, and Pitsis (2012, p. 356) point out a paradox of organisational learning - what is learned might be an unwelcome challenge to existing ways of doing things, even though 'small wins' sometimes have large effects (which I was to see in Chapter 4 below where small changes for individuals had major impacts on where and how they could work). In this way, according to Clegg et al. (2012), learning can be understood as adaptation for people and for their organisations.

Brown and Duguid (1991, p. 48) agree with Wenger's (1998) central assertion that 'the central issue of learning is *becoming* a practitioner, not learning *about* practice'. Their work on how knowledge is generated in workplaces provides a useful practical way of studying the role of affordances in the creation of new knowledge. A major influence on my work has been Cook and Brown's (1999) epistemic view of practice. They add that it is in the 'doing' that affordances are not static (as Gibson's is) and I agree on this. Rather, they are dynamic, and occur in the process of *doing* (journalism, pathology, accountancy, etc.).

Cook and Brown (1999) see affordances from the angle of what is learned in the course of 'productive inquiry' that generates the knowledge required to take action (their 'generative dance' between knowledge and knowing). This aligns with the practical way in which Eraut (2000, 2009) examines the learning, by studying how people do things better or differently, or how they do different things in work practices. In this view, there is a temporal approach to what is learned in practice: past experience informs current understandings, which guides future actions. This further aligns with a Heideggerian phenomenological position which is concerned with 'know-how' (not 'know-that') as practitioners participate in 'being-in-the-world' and also over time. Looking for the learning, using insights from all of these writers, was

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surprisingly easy in empirical work because it amounted to making the learning explicit (as I show in Chapter 5, Table 5.1 below).

Learning in practice to *be* leads to an ontological and phenomenological understanding of social practice. Section 2.4 below reviews Heidegger's theory of usability of equipment (his well-known 'hammer' is the analogy he uses) and the spatiality of practice, leading to a review of studies about flexible work arrangements in terms of spatiality.

## 2.4 PHENOMENOLOGICAL SPACE, PLACE AND EQUIPMENT

### 2.4.1 Heideggerian theory and the broken hammer

A repeated ontological claim arising out of Heidegger's (1962) work is that when things are not working, we know what they *are* because they are reflectively brought to the fore when unusable or broken - in what he terms, a '*present-at-hand*' status) (Palmer, 1969), (and what Gibson (1986) refers to as negative affordances). By using the hammer in practice, it acquires its 'specific Thingly character' (Heidegger, 1962, p. 98). Looking at it will not tell you what it *is* in this view. Polanyi (2003, p. 347) concurs with this: that only by the *function* of the clock, typewriter or computer would you know what it *is* 'by its participation in its purpose'. Furthermore, Heidegger says (p. 184) that that which is usable and unreflected-upon for use, is '*ready-to-hand*' and as such viewed in 'its service*ability*, us*ability* and detriment*ality*' (italics in original).

Schatzki's (2007) interpretation is that Heidegger's hammer is defined by its uses for a whole range of ends and projects, in a referential whole (also T. Wilson, 2015, 2016). The world consists of a 'nexus of available equipment that help delimit the actions and paths we can take …' (Schatzki, 2007, p. 18) in a 'mesh of practices' (p. 175). This aligns well with Gibsonian affordances. J. J. Gibson (1986, p. 134) was

also aware of the naturalised, taken-for-granted and unreflected-upon understandings of things:

> what we perceive when we look at objects are their affordances, not their qualities … what the object affords us is what we normally pay attention to. The special combination of qualities into which an object can be analysed is ordinarily not noticed.

When space, place and objects have negative affordances, or are 'present-at-hand', they are brought to the fore by their inaccessibility and non-functionality, in different ways, for different people. Early data analysis in my study showed that these negative affordances (Gibson) and present-at-hand status (Heidegger) of space, place and objects, for people with mobility impairments, had a particularly spatial connotation (as the data in Chapter 4 will show). This all led, both in my reading of the literature and in early data analysis, to thinking about disability in terms of spatiality.

## 2.4.2 Space and disability

Dreyfus (1991, p. 133) explains that how we understand how things are spatial (near, far or out-of-reach) is that

> Things in the world show up as having a certain accessibility - that is, a certain nearness or farness – according to my ability to 'grasp' or 'procure' them.

The way that he clarifies this is not as a subject/object issue, but rather as the spatiality of being-in-the-world in a referential whole of a totality of equipment. He does, however, criticise Heidegger's lack of attention to embodiment in regard to spatiality (left, right, up, down, etc.). Dreyfus's (1991, p. 138) explanation of how spatiality becomes a reflected-upon problem is when 'there is some sort of disturbance and they become unavailable'. Normally, he says, 'we do not notice that things are accessible;

we just transparently use them, or notice the difficulty of access to them, but go on anyway'.

Even if one accepts Heidegger's lack of attention to embodiment, the degree of accessibility that determines what is 'here' or 'there' reflects the shifting nature of the accessibility of things. Therefore, who *participates* in the practices of 'the world' is dependent on the accessibility of the technology in equipped practice. Gadamer (1996, p. 59) also criticised Heidegger on the grounds that the lived body is 'essentially corporeal' and noticed in terms of pain and limitations - and, like Leder (1990) and Toombs (1992), he sees the body as a faulty tool with a present-at-hand status, for some people, in certain circumstances. In Simonsen's (2007) view, the body is both spatial and practices inherently corporeal. Imrie (2014) takes this further. His view is that designed environments have an exclusionary spatial logic, resulting in spaces that exclude and therefore curtail people's potential to participate fully in societal life. In some ways, this view seems to recognise that affordances can be designed-in (for example, ramps instead of steps), as in Norman's (1999) approach to affordances.

One clear way such 'disabling spaces' have become less disabling in UK workplaces is through legal and institutional frameworks that have been enacted into workplace legislation through the Equality Act 2010 (Imrie, 2014; Imrie & Thomas, 2008). Toombs's (1992) understanding of spatiality and disability is that where illness confines to bed, house or hospital, it also delimits space as restrictive - things are then seen as too far, too high, too crowded, etc. In this understanding, objects can *expand* this space. The white cane and the wheelchair are artefacts that expand space and enable her to move through it. These objects therefore afford 'being-in-the-world'.

The experience (of illness or disability ) is a way of being-in-the-world, also seen as such by Michalko (1999).

Another writer who sees how materiality has the potential to expand lived space is Leder (1990, p. 33), who sees the white cane as a tool, a ready-to-hand technology that is

> not an object, but an area of sensitivity extending the scope and active radius of touch and providing a parallel to sight.

In this view, the body is seen as a faulty tool, as having present-at-hand status, limiting physical action - with the white cane (a 'technology') offering the affordance of mobility.

### 2.4.3 Place and work

Space and place are where things belong (Heidegger, 1962; Schatzki, 2007). As Schatzki (2007, p. 40) explains Heidegger's theory on the significance of place:

> Notice that place, a spatial property of equipment, depends on people, more specifically, on what they do and are up to in acting. This dependency illustrates the idea that being-in-the-world is a unified phenomenon.

In this understanding of Heidegger's meaning of place, the world is a 'region of inter-relatedly placed equipment differentially near and far vis-à-vis activity' (Schatzki, 2007, p. 42). The way I understand Massey's (2005) interpretation of space is that multiplicity and heterogeneity of being-in-the-world are dependent on a recognition of spatiality. And the way I understand Heidegger (1962) on this is that both time and space constitute the horizon from which entities are encountered. Although one does not encounter time or space, they are embedded in the phenomena we study (Mulhall, 2005, p. 25). For example, Mazmanian, Orlikowski, and Yates (2013, p. 1338)

conducted research with solicitors and bankers to study their use of email and the 'collective spiral of escalating engagement where they end up working everywhere, all the time'. The paradox inherent in the spatio-temporal matter of the 'anywhere, anytime' affordance of digital technologies is instantiated in increased flexibility (seen as competence) accompanied by a heightened expectation of availability and responsiveness (Mazmanian, Orlikowski, & Yates, 2006; Mazmanian et al., 2013; Mazmanian, Yates, & Orlikowski, 2006). [15] This confirms Eriksen's (2001) contention that there are unintended consequences of technology. In studies of distributed work arrangements, Bailey and Leonardi (2015) maintain that not all workers take up the enabling affordances that technology offers for distributed work and that different occupations embrace technology in different ways.

## 2.4.4 Flexible work arrangements as spatiality

While it would appear that geographically distributed work is a feature of the modern workplace, distributed work can be traced historically as far back as the Roman Empire and Catholic church (O'Leary et al., 2002). In a study which treated both the Roman Empire and the Catholic church as organisations, O'Leary et al. (2002) claim that twenty-first century organisational work structures face similar basic challenges and paradoxes to the ones faced by work structures centuries ago.

Different perspectives on flexible work practices yield different conclusions. In a study of flexible work arrangements of chartered accountants (all managers and senior personnel) about their perception of flexible work arrangements, it was broadly felt that working from home would be detrimental to career success and advancement and

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[15] REFLECTIVE NOTE: I have, in a small-scale study, researched this and reached the same conclusions. I found that 'anywhere, anytime' meant more flexibility in one area of life (work) but less in another (home), (as in Eriksen (2001)), even though the participants seemed unaware of it.

that the drawbacks of such arrangements would outweigh any benefits from flexible work at home (Johnson & Reckers, 2008; Johnson, Lowe, & Reckers, 2012). In further studies of flexible work arrangements, Fogarty et al. (2011) focused on issues of organisational justice, fairness and control of remote workers compared with office-based workers, while Sheldon (2004) suggested that a reason for offering remote work to disabled workers was to cut costs for employers. Roulstone's (1998) view was that the optimism for flexible work arrangements through the affordances of technology should be treated with caution with regard to workers with disabilities and the potential to work from home. In a more recent study, Sewell and Taskin (2015, p. 1508), researching professional and technical workers for a Belgian pharmaceutical company, found expanded growth in distributed work, with the actual profile of the distributed workforce being associated with 'moderately skilled employees', doing knowledge work (in Europe).

## 2.5 GAP FOR THIS STUDY

Following my literature review, I identified gaps in various areas, leading to the research questions that build on prior research.

Difficulties in locating up-to-date empirical studies in the area of flexible work arrangements and all modes of employment using digital technologies *and* being disabled led me to my research questions. There was no research on disabled employers at all (other than of care assistants). I had difficulties in finding similar kinds of studies on people with mobility impairments at work. In some areas, literature was difficult to obtain or limited in its scope. There is a lot of research in the medical/rehabilitation literature and also on government policy, but qualitative empirical studies, using phenomenological methods, with a similar sample to mine,

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are few. According to Roblyer (2005), the best type of research builds on past research and looks to the future. I started with a puzzle, reflected in the research questions below, and - in the spirit of phenomenology - was open to surprises in the literature (as well as the data). As Schwartz-Shea and Yanow (2012) point out, one starts *somewhere*. This somewhere includes prior knowledge and a sense, through the research questions, where the answers may lie. As Heidegger (1962, p. 185) claims:

> any interpretation which is to contribute to understanding must already have understood what is to be interpreted.

Certainly this assumes that due attention has been paid to the question one asks. In this regard, Roulstone (1998) provocatively asks whether researchers are asking the right questions in the first place. Interpretation from a Heideggerian perspective is an anticipation of possibilities of what is already understood (Introna, 2011). What is brought to light is 'what might be brought into being' – the social world is both real and it is made (Law & Urry, 2004, p. 396).

Research questions must nevertheless be clear, answerable, have boundaries, be operationalisable, modest in scope, not prescriptive and worthwhile (Trowler, 2014). Nevertheless, as Mulhall (2005, p. 29) reminds the student of Heidegger:

> both the origins and the termini of a temporal being's questioning cannot be other than conditioned and conditional.

Furthermore, one can build on Gibsonian affordance theory (again, as theorised by the Gibsons and using the original meaning of the term). In particular an under-explored area in the research is the attention paid to the work of E. Gibson on linking learning to affordances (through the information that is needed to guide decisions). This is also an area not often recognised explicitly, but quite often implicitly (for example in the

research into affordances by Leonardi (2013b)). Links to learning have also been largely overlooked (partly because, I believe, J.J. Gibson did not explicitly focus on them, although E. Gibson did). Norman (1999, p. 39), for example, said of his meetings and debates with J.J. Gibson:

> I came to appreciate the concept of affordances, even if I never understood his other concepts, such as "information pickup."

On the other hand, Ingold (2000, p. 166) recognises this 'information pickup' as a major part of the theory:

> Novel perceptions arise from creative acts of discovery rather than imagining, and the information on which they are based is available to anyone attuned to pick it up.

It was this latter viewpoint of affordances that was to present an opportunity to research – and which I was to confirm in my own analysis of affordances and at a much later stage.

### 2.5.1 Research questions

The research questions have the purpose (as questioning of this type does, according to Gadamer (1975, p. 375)) of directing one towards the answer in a process which 'means to lay open, to place in the open'. In this way, the questions place that which is questioned in a particular light, having directed the study and its methodology (Law & Urry, 2004). The three questions guiding this study begin with a descriptive question, followed by analytical questions, leading to my interpretation, a conceptual one, synthesising affordance theory, Heideggerian phenomenology and a social barriers approach to disability into my interpretation of the phenomena:

1) How do people, in managerial and professional employment, who have mobility impairments, use digital technologies in their workplaces?

2) In what ways can affordances of technology be revealed as phenomena in work practices?

3) In what ways can these phenomena be interpreted?

## 2.6 SUMMARY AND NEXT CHAPTER

This chapter began with a brief description of how prior research was sourced and managed. I then explained my approach and the logic of zooming between different theoretical perspectives. I reviewed disability theory and modes of employment before examining theories of usability: affordance theory and Heideggerian phenomenology.

The research questions lead directly to the choice of methodology and its underpinning philosophical assumptions (Maykut & Morehouse, 1994).

 Chapter 3 below, the Methodology chapter, lays out the strategy of the research design, the sampling, the ethics and finally, the methods of data collection and of data analysis.

# CHAPTER 3 - METHODOLOGY

## 3.1 OVERVIEW OF THIS CHAPTER

This chapter outlines the empirical strategy of this study and the reasons for selecting hermeneutic phenomenology as a research methodology and theoretical lens, since it is both a philosophy as well as a methodology. For this reason, I include in this chapter how I align and reconcile the different theoretical frameworks I use. I outline the sampling strategy and its challenges and explain the methods of data collection and analysis. I conclude the chapter by considering, at some length, the ethical considerations of research with participants who have self-declared a mobility impairment.

This study uses a qualitative hermeneutic phenomenological strategy with eleven participants, all with mobility impairments, who use digital technologies in the course of their paid work in different modes of employment. The research aimed to gain an understanding of how people use digital technologies at work and how the phenomena seen in the observations can then be interpreted.

### 3.1.1 Planning for rigour

To begin the research design, and after a comprehensive literature review had been conducted in which I identified the gap leading to this project, I produced a planning matrix to plan the entire research effort together with its companion audit trail to control issues of rigour and ethics. The specific purpose of this audit trail is to show a commitment to rigour in social research, with a trail of evidence and where it may be found (see *Appendix 4*).

Research design is, to a large extent, an exercise in project planning, control and management, with an emphasis on logic, coherence and attention to detail (Trowler, 2012a). A 'planning matrix' adapted from Cohen, Manion, and Morrison (2007, pp. 88-92) guided this project through the different logical (and expected) sections, with planned, inbuilt flexibility (Blaxter, Hughes, & Tight, 2010). My audit trail ensured that issues of triangulation, reliability and validity (or 'trustworthiness') were kept in focus and updated whenever new data became available (Lincoln & Guba, 1985, p. 218).

### 3.1.2 Rigour and interpretation

Rigour needed to apply to all parts of the research, not least to the interpretation of the data (Finlay, 2009; Lavoie, 2011). Interpretation must be logical, plausible, probable and accompanied by evidence wherever possible (Hirsch, 1967). As one way to do this, I offered participants summaries of the research findings and they all agreed that we would have further contact to check my understandings of their transcripts, where necessary. (See *Appendix 7* for examples). Participatory research does not necessarily mean that the participants either design the research nor that they evaluate the findings.  Norlyk and Harder (2010, p. 428) describe participation understood this way as 'wholly indefensible theoretically'. Similarly, Giorgi (2010, p. 14) says that it is 'theoretically unjustifiable' for participants to evaluate the researcher's findings for three reasons: firstly, that participants *describe* lived experiences with the researcher doing the *interpretive* work with the transcribed text; secondly, that the disciplinary perspective of the researcher is different from that of the participant and thirdly, that the person living the experience may not be best positioned to interpret their own experience. On this basis, I did not offer to discuss my interpretations, informed by

theory, literature and prior research with the participants ahead of my submission of the thesis. Rather, I told participants that I would send a summary of my findings, which I did at the very end of the process, by email, to all participants, advising that in due course, I would give them access to the full thesis if required.

I found Moustakas's (1994, p. 57) concept of 'intersubjective validity' a natural corrective mechanism *during* conversations and in which reciprocal clarifications took place of the type 'did you mean ...?' or 'could you show me again?' in a process of reflection-in-action (Schön 1987). These intersubjective meanings are what Gadamer (1975) terms a 'fusion of horizons' of the participants' descriptions and the researcher's developing interpretations.

Planning for rigour in this study was a matter of developing consistently vigilant habits in empirical work and was largely a question of attention to detail in the logic, traceability and accountability at all stages of it, in a repetitive and iterative (often clerical) process.

Concerns of validity and reliability have roots in positivism and even though 'trustworthiness', 'credibility', 'plausibility' and 'transferability' can replace their positivistic forebears as criteria for rigour in qualitative research projects, there remains the requirement, in *descriptive* phenomenology, to acknowledge 'bias' and to stand away from what is being investigated in an 'objective' way (Cohen et al., 2007). This is instantiated as the 'phenomenological reduction', an expectation that the researcher will approach the topic under investigation in a distanced state of naïvety and openness to 'see afresh' (Finlay, 2009). In hermeneutic phenomenology, the methodology I use, there is no such concept. Rather, the researcher's pre-suppositions are openly recognised as provisional understandings which will be revisited during the

research 'with the benefit of a deeper understanding' (Mulhall, 2005, p. 31) to add layers of new meanings in the form of one's findings. Because phenomenology of this type looks at the *phenomenon* (*not* the participant, their lifeworlds or their opinions), there is a natural inclination at times to get closer to the parts of the research, at times to draw back to consider the whole, thereby engaging with the 'hermeneutic circle' (Mulhall, 2005, p. 31), an analytic which relates the parts to the whole of the phenomenon under examination. As Seamon (2000) points out, the most significant test of trustworthiness in any phenomenological study is its power to draw the reader into what has been revealed, introducing them to new understandings as well (based on, presumably, how credible, plausible and, particularly, how transferable my interpretation may be considered).

### 3.1.3 Research questions vis-à-vis methodology

I designed research questions to lead from descriptive to analytical questions (Trowler, 2012d, 2014). The process of writing the questions was challenging, not only to design bounded, researchable and answerable questions, but to guide subsequent decisions. Both the descriptive and analytical questions gave indications of possible suitable paradigmatic strategies.

1) How do people, in managerial and professional employment, who have mobility impairments, use digital technologies in their workplaces?

2) In what ways can affordances of technology be revealed as phenomena in work practices?

3) In what ways can these phenomena be interpreted?

## 3.2 CHOICE OF METHODOLOGY

### 3.2.1 Alternative strategies

Since the choice of methodology flows directly from the research questions, I am sensitive to the philosophical commitments underlying these methodologies and recognise that they have implications for the entire study (Lincoln & Guba, 1985; Maykut & Morehouse, 1994; Orlikowski & Baroudi, 1991; Parchoma, 2011). Furthermore, if realities are enacted by research methods, the research questions, as constructed by myself, are naturally predisposed to a phenomenological strategy, since they are expressly designed to ask about people's understandings of the phenomenon (using digital technologies in the workplace) (Finlay, 2013; Law & Urry, 2004; Orlikowski & Baroudi, 1991).

Researching such understandings leads to major philosophical commitments, because various versions of phenomenology are considered naturally incommensurate and incompatible with one another (Finlay, 2009; Giorgi, 2008). For brevity, there are two major schools: the 'descriptive' (seen in the writings of Husserl, Giorgi, Moustakas, Merleau-Ponty and Van Manen, for example) and the 'interpretive' (Heidegger, Gadamer, Ricoeur and Schatzki, in particular). As briefly alluded to in section 3.1.2 above, descriptive versions are predicated on the concepts of 'phenomenological reduction' instantiated as the epoché (or bracketing), whereby the researcher distances themselves from the phenomenon under investigation in order to approach the research with some sense of naïvety (Moustakas, 1994). Some of these descriptive versions also look for the 'essence' or the invariant common property of the

phenomenon.[16] I have difficulties accepting the primacy of the epoché for two

reasons. Firstly, it is neither possible nor practicable for me to 'bracket' myself out of

any aspect of the research investigation. Secondly, it seems a fairly positivistic ideal to

actively make an attempt at being 'unbiased' (Finlay, 2009; Heidegger, 1962;

Vandermause & Fleming, 2011). I prefer to explicitly acknowledge that prior

knowledge (of the literature, existing research and related theory), as well as my

gender, education, social status, race, nationality, values, context and interpretations,

all have a bearing throughout the research process (Lincoln & Guba, 2013; Schwartz-

Shea & Yanow, 2012). The other difficulty I have with descriptive phenomenology is

the concept of the 'essence' of a phenomenon (Merleau-Ponty, 1962). Since an

'essence' is an invariant core characteristic of a phenomenon, it is also a type of

generalisation (and therefore another fairly positivistic ideal of a universal truth, in my

view) (Giorgi, 2008). I prefer Heidegger's interpretation – '"essence" means *what*

something is' (1977, p. 29), that is, an ontological state, rather than a property. Both of

these considerations led me to a hermeneutic phenomenological strategy, briefly

described below, as one of a number of possible strategies considered.

I considered various research strategies, all of which I had used in other research

projects and all of which I then rejected. These different strategies would have

required a rewording of the research questions to reflect their underlying philosophical

commitments.

One of these possible strategies was 'narrative inquiry', in which participants tell their

stories and both researcher and participant then make sense of them (Clandinin &

Connelly, 2000). I realised that this would be too risky a strategy, as I would be too

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[16] REFLECTIVE NOTE: Giorgi's (2007) interesting position on this is that description *is* a type of
interpretation.

dependent on participants having a story to tell, one requiring a beginning, middle and end, about their use of digital technology at work. The first of the pilot conversations reinforced this concern – the pilot-participant could not think of a story to tell me at all. Although I discarded this as a research methodology, I nevertheless use Clandinin's (2000, p. 182) concept of narrative 'wakefulness' as a generic guide to ensure rigour in narrative accounts.

I then considered case studies. As single, bounded cases with a small sample size, this strategy could have worked, but then the research questions would have asked 'how' and 'what' questions about the participants' lifeworlds as situations at work, using digital equipment (and conversations about their lived experience of it). Therefore, different questions and different conversations would have taken place (Vissak, 2010). Case studies are also often seen as 'a collection of anecdotes and war stories' (Stuart, McCutcheon, Handfield, McLachlin, & Samson, 2002, p. 429) and while some versions of phenomenology effectively employ embedded case studies to study the same phenomenon with different participants, I kept an open mind about this at the pilot stage.

I also briefly considered 'organisational ethnography', but discounted it, knowing that there would be limits to field work and observations, as well as problems of access, to study the culture of organisations (Visconti, 2010). Furthermore, while organisational ethnography is also an 'interpretive craft' (Van Maanen, 2011, p. 219), I was not planning to study corporate life and culture, but understandings of phenomena in workplaces.

I had originally thought that an interpretive phenomenological analysis (IPA) could have been a viable strategy. When I looked into critiques of IPA, I was faced with a

worrying and unexpected problem as to what exactly makes a study a phenomenological one. Not knowing the answer to this (and finding no guidance from the IPA Internet Forum on it)[17], I decided to do as Giorgi (2008) suggests, which is to go back to primary methodologists, choose one and remain with the philosophical commitments of that choice. Chamberlain (2011) and Giorgi (2010) maintain that it is not clear which version of phenomenology IPA advocates, leaving IPA studies frequently qualitative, but not phenomenological. In many ways, using IPA would have made the study a much simpler methodological exercise, as it is prescriptive and specifies the number of quotations the researcher ought to use as evidence, dependent on the size of the sample – but it ignores the underlying philosophy of phenomenological perspectives. As a result, this led me to Heidegger's work, a very much more difficult enterprise all in all, for, as Giorgi (2007, p. 70) points out, the problem of translating a philosophical approach into an empirical one is 'trickier than appears' and, indeed, I found it so, because, as Heidegger (1982, p. 21) advises about the use of phenomenology in empirical work: '(it) grows and changes organically in the context of the interpretation'. Additionally, I had to learn Heideggerian terminology and also how to use it correctly in my empirical work – and this presented many challenges.

Having filtered out theorists and methodologists whose basic premises would not be compatible with my own beliefs (particularly on the epoché and the meaning of 'interpretation'), I concluded that the only one which is the closest match to the research questions *and* to my own world view of research in general – and, in particular, of understanding and interpretation – is hermeneutic phenomenology.

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[17] http://www.ipa.bbk.ac.uk/

### 3.2.2 Hermeneutic phenomenology as a research methodology

Phenomenology as a method of investigation can be seen as one including several steps (Ilharco, 2008). These steps begin by describing the phenomena from observations in practice and then reducing data so gathered into categories and themes, to conclude with a holistic interpretation made through the relationships between the different elements (and theory), including hidden meanings exposed by the analysis (Heidegger, 1962; Ilharco, 2008). Without a prescriptive model of how to operationalise a philosophy into an empirical study, I took my guidance directly from Heidegger and from phenomenological methodologists for, in spite of the incommensurability between their different philosophical positions, their methods of data collection (and, to some extent, analysis) are broadly similar (Finlay, 2009; Giorgi, 2008; Moustakas, 1994; J. A. Smith, Flowers, & Larkin, 2009; Van Manen, 2007).

Heidegger (1962, p. 50) advises:

> the term 'phenomenology' expresses a maxim which can be formulated as 'To the things themselves!'

A phenomenon, defined as 'that which can show itself in itself' (Heidegger, 1962, p. 51) or the showing of something as it is and brought out of concealment (Palmer, 1969, p. 127) is at the heart of any phenomenological study. Through disclosure or revelation, these phenomena become manifest 'without forcing our own categories on them' (Palmer, 1969, p. 128). Since in Heidegger's work, people's understandings are tied to their socio-material practice (what he calls 'being-in-the-world' (1962, p. 91) with 'equipment' (1962, p. 97)), in order to bring the phenomena under examination

to light (workers and their use of digital technology), in-depth discussions and observations were arranged.

The first step was to document the observation and conversation (and to have as the goal, to allow the phenomenon to disclose itself). As Heidegger (1982, p. 21) advises, 'we do not simply find it in front of us'. This was followed by the next step, creating the text. Since Heidegger's work is predicated on the primacy of time, meaning the contextual present, the historical past and the projected future, empirical work is sensitive to and asks questions that are based on temporal concerns: 'what *did* you learn from that?', 'what *is* going on here?' and 'what *will* you do next?'. As the phenomena are hidden and need to be brought to view, Heidegger (1982, p. 69) advises that the 'puzzlement' in doing so is part of the enigmatic character of phenomena and that one should resist arriving at premature conclusions while collecting data – either by categorising the data too soon or by attaching theory too quickly.

One important way of making Heideggerian phenomenology empirically practical is to take Heidegger's (1962) terminology and look for the *'where-in'* (the context), the *'in-which'* (the equipment), the *'towards-which'* (the goals) and the *'for-the-sake-of-which'* (the broader concern) as the phenomena unfold and this is what I did when analysing the data, from a very early stage. What is analysed to arrive at an interpretation informed by literature and prior research, is the text created from the transcriptions. Hermeneutics is the theory of understanding, the basis of all interpretation (Palmer, 1969, p. 131) and interpretation is the 'rendering explicit of understanding' (Palmer, 1969, p. 134). Heidegger (1977, p. 22) refers to his method of analysis as his 'reduction, construction and deconstruction' analytic.

### 3.2.3 Criticism of phenomenological strategies

As a qualitative strategy, phenomenology has been criticised on the grounds of the trustworthiness of phenomenological descriptions and interpretations (Seamon, 2000). Reliability in qualitative research is considered as 'transferability', that is, to what extent one's reader is able to identify with the findings as being plausible, credible and recognisable (Lincoln & Guba, 1985). Mostly, phenomenology has been criticised for being 'too subjective'. But as Van Manen (1990, 2007) points out, phenomenology does not look for the participants' *views* – rather, it looks at uncovering *phenomena*.

Paley (2014) has criticised empirical studies (mostly in nursing), which claim to be Heideggerian in nature. His view is that Heidegger's foundational ideas are frequently misused, misunderstood and misquoted in empirical research. In particular, he criticises studies that draw on 'lived experience' and points out that it is philosophically contradictory to do so in a Heideggerian study. The reason is this: on the basis that subjective experience as described by the participant is subject-orientated, such a view works with, not against, the very Cartesian subject/object duality that Heidegger (and also J. J. Gibson, working on his affordance theory) tried to overcome (by studying the phenomenon, not the individual).

The phenomenologist is looking for:

> where meaning originates, wells up, percolates through porous membranes of past sedimentations – and then infuses us, permeates us, infects us, touches us, stirs up, exercises a formative effect (Van Manen, 2007, p. 11).

By observing participants in action, I was triangulating the data and not concerned with the veracity of a historical narrative version of how they worked. Schatzki (2005) also suggests that observation of practices is the best way of collecting this kind of data. While Nicolini (2012) criticises Schatzki's method of observation as being

vague, I see it both ways, and for reasons that neither Schatzki nor Paley have expressly provided in the references above. My understanding is that in order to allow the phenomenon to reveal itself, it is incumbent on the researcher to do *both:* to *observe* what the participant *does* in practice and to *discuss* it with them, especially with regard to spatio-temporal horizons of understanding.[18] My interpretation is that 'past sedimentations' (Van Manen, 2007, p. 26) ground the data in history and time, shaping our understandings, informed by our theoretical lenses and other presuppositions. And, as Trowler (2012b) points out, theory is already infused in the participants' own theories before we, the researchers, add our own layers to that interpretation.

Despite criticisms of phenomenology as a strategy, my aim is to reveal how people, at work, use their technologies and then to link this, through theory and prior research, to an interpretation of affordances (seen in terms of usability as access or barriers). A phenomenological approach can add a layer of understanding to disability studies, particularly because research methods in disability research have frequently been linked to deficit medical/rehabilitation models – especially in workplace environments (Roulstone, 1998). Phenomenology, according to Paterson and Hughes (1999, p. 604), may be criticised as having an 'undersocialised' approach to disability (at least as far as the social model of disability is concerned) but it does acknowledge the body in the process of revealing phenomena. Paterson and Hughes's (1999) way of countering criticism about both phenomenology and the social model of disability is a compromise: one in which impairment is social (not medical) and disability is embodied (not political). In my study, this turned out to be an excellent way of

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[18] REFLECTIVE NOTE: Observation without reflective discussion (contrary to Paley (2014) above) can be a demonstration of a skill, rather than a discussion of the discursive aspects of the practice.

addressing the paradoxes of studying disability in a social, as well as an individual, embodied way. Exposing phenomena allowed me to focus on 'what is going on here?' (Silverman, 2006, p. 66) in a way that transcended premature categorisation. Categorisations pervade theory and prior research which I found better dealt with many months after the observations and conversations, by which time a holistic picture was emerging, together with its component themes. In this way, categorisations and dualities can be considered further along in the process, while keeping an open mind during the data collection phase. Dualities and categories are brought into focus later, when building on prior research, incorporating different theoretical lenses and arriving at tentative findings.

In a study of doctoral students' use of phenomenology as a research method, Giorgi (2008) found that phenomenology is often cited correctly, but not used correctly. I have made efforts to avoid these misuses and in particular to use Heidegger's interpretive version and not to incorporate incompatible versions of descriptive phenomenology.

## 3.3 ALIGNING THEORETICAL FRAMEWORKS FOR EMPIRICAL INVESTIGATION

I believe that paradigms *do* matter. A paradigm, an overarching and interconnecting belief system with its own specific ontological, epistemological and methodological conventions, signposts one's reader broadly to the world view of the researcher, vis-à-vis the research project. The choice of paradigm *does* matter because this choice has far-reaching consequences vis-à-vis data collection, analysis and use of theory (Guba & Lincoln, 1994; Lincoln, 2010; Maykut & Morehouse, 1994). Even if one accepts that paradigms are 'interbreeding' (Lincoln, Lynham, & Guba, 2011, p. 97) and that

there is a 'blurring of genres' (Geertz, 1983, p. 19) – for example, in the form of mixed-methods research – I prefer to use a methodology (a) fully and (b) as paradigmatically correctly as possible. I use theory which has commonalities and coherences rather than incommensurable positions and underlying paradigmatic divergences. In particular this applies, in the practical empirical work explored here, to a vast body of medicalised, rehabilitation-oriented research into the medical reasons, cures and therapies for mobility impairments and methods of rehabilitation (often aimed at employment). Having said this, no one theory is all-embracing, often occluding where another affords different insights. This is my purpose of using compatible theory that can link the parts of my study to its referential whole in the hermeneutic circle. In this regard, Bensman and Lilienfeld (1991) rightly, in my view, warn that grafting phenomenology onto other perspectives requires very careful consideration, not least of which is that within phenomenological perspectives; there are the two schools mentioned in section 3.2.1 above which can be incompatible with each other and this would impact on the *kinds* of data collected (as collecting data about phenomena is fundamentally different to collecting data about 'lived experience').

In terms of exploring the phenomena exposed, I use the work of major writers in practice theory, which has flowed from phenomenological influences (T. Wilson, 2015), in particular overlapping and compatible positions on digital technologies, distributed work and knowing-in-practice (for example Feldman & Orlikowski, 2011; Leonardi, 2011; Orlikowski, 2007, 2008; Treem & Leonardi, 2012).

One area of question with regard to commensurability is the original, political and emancipatory version of the social model of disability (which has Marxist underpinnings). The way I overcome this potential difficulty is by focusing on

disability as a *phenomenological interpretation*. By looking at the *phenomenon* and what it exposes, I believe that I am able to overcome any possible incongruities. Nevertheless, what remain are a few paradoxical concepts vis-à-vis disability theory. Firstly, the paradox of talking to *individuals* when the social model is concerned with socially constructed barriers for people and actively *resists* individual issues. Secondly, the *social* model is predicated on emancipatory co-authored research which does not necessarily include every research project (nor mine). I did not reconcile these paradoxes in my research and it was never my intention to do so.

The following three subsections indicate how I use theory as linkages in the analysis to arrive at a holistic understanding, in the context of participants' usage of their technologies at work.

### 3.3.1 Making hermeneutic phenomenology researchable

Heidegger's philosophical work, *Being and Time* (1962) is predicated upon his contention that our understanding (of who we *are*) is implicated in what we *do.* This way, we understand entities around us as tools or *'equipment'* in embodied, embedded social practice (T. Wilson, 2015). An important component of Heidegger's position on equipped practice is that people are 'skilfully manipulating it in a hitch-free manner' (Wheeler, 2015), as usable and *'ready-to-hand'*. But when space, place or things are not usable or accessible to people, for one reason or another and show up as, for example, too far, too heavy, too high, too small or too cluttered, making this space, place or object unusable or inaccessible, these are *'present-at-hand'*. Heidegger (1962) says that as such, what is not usable is brought into focus *because* of its non-functionality and 'present–at-hand' is a term to which I frequently refer below in the data analysis.

The link between social practices, technology and phenomenology can be demonstrated as people use this equipment, in practice, while *doing*. From a phenomenological perspective, disability, like work (Gherardi, 2012), is one way of *being-in-the-world* (Michalko, 1999; Toombs, 1992).

### 3.3.2 Making disability researchable

Disability lends itself to phenomenological inquiry as it has the temporal quality which is found in Heidegger's work - 'before my accident…', for example. According to Reckwitz (2002, 2012), practices are routinised embodied actions as sequences in time (for example, doing/seeing/saying, *this*, then *that*). This conceptualisation makes it possible to research disability by asking appropriate, answerable questions, located contextually and spatio-temporally, in embodied socio-material practice (without asking intrusive and unnecessary questions about impairments). In practice, usability of place, space and things is also well aligned with affordance theory, which, like Heidegger's work, rejects the subject/object issue with affordances bridging both (J. J. Gibson, 1986).

### 3.3.3 Making affordance theory researchable

Empirically, spatio-temporal questions ask questions of workers with mobility difficulties, in the form of 'where?' and 'when?' questions, give rise to expected answers in the form 'above me',[19] 'too far', 'too high', 'on top of', 'behind', 'to the left', 'in the past …' (Mulhall, 2005). The answers to these 'where?' and 'when?' questions lead to a revealing of the phenomenon, which, in this case, turned out to be the *'where'* and *'how'* of work. When people were faced with situations and

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[19] REFLECTIVE NOTE: Participant 5 works lying flat on her back, with her computer suspended above her head.

technologies that were not usable (too heavy, too small, too fiddly, too far, for example) these presented as negative affordances and I then asked how they solved the problems in these work environments, which led to finding out what was learned. What was learned, through a variety of reactive strategies (in response to finding a solution to a problem), was then tabulated (in Chapter 5), to find the learning that was then used to effect a solution when affordances of space, place and technology had negative affordances (and were unusable or *present-at-hand*).

## 3.4 PARTICIPANT SELECTION STRATEGY

### 3.4.1 Recruitment of participants

I have included a table of the participants, their job descriptions, the digital technologies in use, general comments, mobility aids in use and their flexible work arrangements in Chapter 4 (see *Table 4.1*).

According to Roulstone and Williams (2013), workers with disabilities are less likely to be in management positions at work and are more likely to be working in the voluntary/charity or public sectors than in the private sector (where earnings of disabled people are higher). I find their approach in this study of 42 managers with disabilities very useful. When they advertised for participants, they requested individuals who were prepared to share their experience of being disabled managers, rather than to overtly ask about the barriers they might face, allowing workplace practices to be discussed. Although not a phenomenological approach, it was a useful way to approach my own sampling strategy when advertising for participants, as I wanted to observe the phenomenon, rather than harvest the lived, past experience of it. I then carried this strategy further into the interviews to expose the phenomena, rather than to explicitly ask about barriers.

I have used a purposive, non-random, non-probability criterion sample to find participants to meet set criteria: adults who are wheelchair-users or people with self-declared conditions limiting their mobility, in full-time paid work or self-employment and using digital technologies at work. Cohen et al. (2007, p. 115) describe such a sample as 'deliberately and unashamedly selective and biased'. My purpose was to find participants with in-depth knowledge and experience of the phenomenon who would be willing to share their experience of using digital technologies at work with me. I was not looking ahead for variation, patterning or themes in data, but for people who would be able to share their unique and situated experience of the phenomenon, through (mostly) observations of digital technologies in practice. The reason for including paid work in the sampling criteria was based on Sapey's (2004) definition of exclusion of people with disabilities, being exclusion from paid work. Similarly, the Department for Work and Pensions (2011, p. 145) defines 'employment' solely on the basis of paid work.

The reason given by Ville and Winance (2006) for using a purposive sample of 36 wheelchair-users in their study of their occupational trajectories was to look for a type of homogeneity among participants with regard to their experience of accessibility, in particular of being in a seated position, who might experience the same type of stereotypical or occupational disadvantages. This is a good way of delimiting the sample without focusing on people's individual impairments and a way which resonated with my own sampling technique. It subsequently brought to light the spatiality of the work environment.

Small sample sizes are acceptable to Trowler (2014) when the researcher is looking at *phenomena* as the primary unit of analysis (rather than at the *participant*), when in-depth understanding is sought, and when the application of theory plays a large role in

the interpretation of the data, while O'Reilly and Parker (2013) take the view that an adequate sample size is one which yields sufficient data to answer the research questions. Saturation is neither sought, nor does it have meaning in phenomenological perspectives which are predicated on the view that 'meanings are infinite' (Dahlberg, Dahlberg, & Nyström, 2008).

I conducted 13 conversations, using the first two as pilot conversations which I detail further in Section 3.4.3 below. Of the 11 conversations included in the research, two were conducted on the telephone (with participants in Scotland). In the participant information sheet (see *Appendix 5*)*,* I originally asked the participants to 'reflect-upon-action' (Schön 1987) about their embodied engagement with technology at work, thinking I would be discussing lived experience which I later realised was incommensurate with my methodology, which is predicated on phenomena, not on past 'lived experience' (Yanow & Tsoukas, 2009). In the empirical phase, by and large, the observations superseded this and where past experience was discussed I was careful to make attempts to understand the phenomenon as described but not seen.

### 3.4.2 Limitations

The sample in this study, being purposive and small, is not necessarily representative of anything but itself. The results from the study may therefore not be generalisable to a wider population. The findings will show (and contrary to my pre-understandings and expectations at the outset) that this sample revealed 11 high-level, mostly well-educated competent users of digital technologies ('high-flyers', in the terminology of Shah (2005)) who were able to embrace the enabling affordances of technology and manage and manipulate the restricting affordances thereof. Zola (1982) would define these 11 people as 'mainstream successful adapters' – who are *not* good

representations of disabled workers (a generalisation in itself). Statistics of employment overwhelmingly point to large-scale under- and un-employment for people with disabilities, internationally.[20] Certainly, the sampling criteria in no way used criteria of success and competence as filters to participation in the research. But this does foreground Cohen et al.'s (2007, p. 115) description above, that the nature of my sample was inherently selective and 'biased'.

While I recognise that interpretations are contextual and unique, and that other researchers would necessarily produce other findings using different theoretical lenses, I would hope nevertheless that a researcher using the same lenses would arrive at similar, hopefully 'plausible', 'credible' and possibly 'transferable' results (Lincoln & Guba, 1985).

### 3.4.3 Pilot conversations

I conducted two telephone calls as pilot conversations. I used a landline on speakerphone to record one of the pilot conversations. I did not use either conversation, but for two different reasons. Firstly, I had a Skype conversation with a person in Wales who answered an advertisement for participants, but I could not verify that he met my criteria for inclusion. I found that he had his own website and could see from that that he did not have the mobility impairment he had said that he had. I was therefore not satisfied with his reasons for responding and excluded his conversation entirely.

Secondly, in the second call to Scotland, the resulting transcription had a backdrop of an irritating buzzing sound from recording from a landline, but, more important, I

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[20] United Nations: http://www.un.org/disabilities/

found it difficult to understand the participant's accent without non-verbal cues and eye contact. Additionally, I did not fully understand the person's assertion that limited vision was a mobility issue and one more limiting than her primary arthritic condition (which I only clarified later with a participant I observed). A further difficulty in this pilot conversation, which I did not experience in the live conversations, was an awkwardness in silences on the telephone, whereas silences in live conversations frequently became opportunities for the participant to reflect and then add another thought – or, inter-subjectively, I might have had new insights in these moments of silence and, on reflection, could have used such interludes to make very early connections to theory, literature or what another participant might have told me, either similarly or very differently. These two pilot conversations led to the conclusion that phenomenological-type conversations are best conducted face-to-face as informal conversations. The data will show below, with two other participants, why, for them, their blindness was a mobility problem (also considered as such by E. J. Gibson and Schmuckler (1989)). The pilot conversations confirmed that the questions asked were the right *kind* of questions needed for the data analysis at a later stage, to answer the research questions.

### 3.4.4 Sourcing the sample

Finding a sample to fit the criteria I set was a far more difficult endeavour than I had expected. French (1988, p. 176) also had similar problems to those I experienced, in locating disabled professional and managerial personnel:

> Locating these people was difficult and the interviewing involved extensive travelling.

This was exactly the situation I faced at the sampling stage and it became a matter of concern that I would ever find participants to answer the research questions at all. As Watson (2002) points out, it is difficult to tell exactly how the disabled population is constituted when many people with disabilities do not consider themselves disabled.[21] Advertising on local notice boards at employment centres for disabled people did not yield any responses; neither did an advertisement at my local post office. Finally, when a request at a mobility company to send a flyer to its customers failed as well, I realised that I would have to expand my search (or change the criteria when it was suggested that I expand the range of disabilities to a broader population – something I was unwilling to do). Three of the participants had visual impairments in addition to mobility impairments – two of these told me that loss of vision for them, *is* a mobility issue, since their mobility was substantially reduced *because* of their loss of vision (also see Gallagher et al. (2011) and Michalko (1999)). Different participants were sourced in different ways. I wrote to various professional bodies and one of them circulated an email to its members. This resulted in one interview which came via email from the human resources manager, who had circulated her own email to the organisation's members. That participant (a solicitor) signposted me to a charity which yielded another participant, a vocational support counsellor for people with spinal cord injuries. Another advertisement, in the classified section of a different charity's website, yielded one participant, a town-planner. One person online advertised my request on her Facebook page, which yielded four participants: an equalities consultant (herself), a histopathologist, a journalist and a recruitment executive. A friend working at the National Health Service approached a colleague of

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[21] REFLECTIVE NOTE: Participant 8, for example, a young woman with a long-term degenerative spinal condition and a permanent wheelchair-user needing help with dressing and bathing, told me that she does not consider herself disabled at all.

hers – a director of complaints manager – one of only two participants local to where I live (the other being my husband, a chartered accountant). The two people in Scotland (an administration officer and project manager/IT (information technology) trainer) both worked for the same charity and I spoke to both on the telephone (and subsequently by email).

Since one of the participants is my husband, I need to be clear about my role in researching using a family member's data. As a wheelchair-user and a self-employed professional, my husband has a particular view of the enabling possibilities of digital technology in his workplace – that without the technologies he uses, he would not be able to do the kind of work he does[22]. I did not see a conflict from an ethical perspective. Rather, my own lived experience of living with a person who is a wheelchair-user reflects Moustakas's (1994, p. 105) view that 'excitement and curiosity inspire the search' when the researcher has a personal interest in it.

At the end of the interviewing process, I was to realise that most of the participants came from middle-class backgrounds and had university educations. I wondered to what extent these intersectional factors made a difference to their employment opportunities. Sutherland (1981, p. 35) contends that:

> It is much easier to counteract the stereotyped ideas of disability on which discrimination is founded if one possesses a middle-class background and accent, a university education and the particular type of articulacy and self-confidence that these factors produce[23].

Even if this is so, as Watson (2002) points out, there is no one homogeneous group of disabled people – differences exist, in intersectional ways, through gender, class, age,

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[22] He is willing to be identified for transparency, as is Participant 2.

[23] REFLECTIVE NOTE: Discussing this quotation with one of the participants, he commented that opportunities for middle-class people are better for the *general* population and not *only* for people with impairments.

ethnicity, sexuality, etc. and the only commonality is impairment. Nine of the 11 were

university graduates, with market-related incomes, all living in their own homes and

in managerial/professional positions. I did not set out to find this type of sample: I set

out to find adults, in paid work, with mobility impairments, using digital technologies.

What this purposive sampling strategy did was to filter and attract 'knowledge

workers' and, through this filtering, it attracted the kind of people who responded.

One result of my sampling strategy was to yield these well-educated 'knowledge

workers', all skilled at using digital technologies at desk-based work. In a study of 33

participants, Phillips (1990) found that the sample was similarly of well-educated

disabled respondents although the rationale in this American study was that the

respondents were better educated *because* of their limited employment opportunities,

which was not the case in my sample. Educational opportunities and choice of initial

careers were not linked to participants' impairments, although two participants

changed careers *after* adult-onset illness.

## 3.5 METHODS OF DATA COLLECTION

I approached this task by looking for appropriate methods of data collection that

would allow the embodied and relational nature of socio-material practice to be

revealed (as recommended by Finlay (2011)), while simultaneously looking for

(ethical) methods compatible with the social model of disability.

The first step, the initial contact with participants, was by email and all responses were

in reply to advertisements for participants who met the criteria. Replies were sent by

email, with a participant information sheet, giving the participant an idea of the data I

was looking for and the *type* of discussion I was hoping to have (see *Appendix 5*). I

deliberately asked people to think about particular areas that I wanted to cover, giving

the participant plenty of time to reflect and consider what they wanted to tell me. In the opening emails, I explained my interest in the topic (see *Appendix 6*).One or two possible interviewees decided not to proceed at this point. One who agreed, later changed her mind.

 The next step, where the participant was willing to proceed, was to set up the time and place to meet. For personal and unplanned reasons, all of these conversations took place over a period of a year and I was unable to reschedule one, which I tried to postpone. All of the conversations (except the last two in Nottingham and two on the telephone), involved travel to other cities and none of the participants were known to me beforehand (other than my husband). The big gaps between collecting data from participant 1 to participant 11 enabled me to reflect on the data and to use 'headnotes' (Ottenberg, 1990) to make connections even before the transcription phase had begun. The problem with such large gaps between conversation and transcription was that deictic and ostensive references needed clarification, but since I had maintained correspondence with these participants, clarification was a simple matter of further email communication (see *Appendix 7*).

### 3.5.1 The phenomenological interview and observation

In 'reflection-upon-action' (Schön, 1983), I consider the 'phenomenological attitude' to be more than an empathy with participants; rather, it is an ability to make oneself open to 'seeing afresh' that which shows itself to the researcher (Finlay, 2011). Wimpenny and Gass (2000) considered the difference between phenomenological interviewing and interviews in grounded theory strategies and concluded that there was not much difference in interviewing techniques at all. I view it differently. The phenomenological interview, for me, is a case of cultivating a personal *way of seeing*

(and *being*) that develops sensibilities to a phenomenon. Such a sensibility is about an openness to uncovering what is hidden, what is layered, what is there, but obscured from view until one intentionally interrogates it until it becomes visible – and then, putting one's presuppositions to one side, modifying such pre-understandings from what one has learned. How I operationalised this practically was by deliberately avoiding taking lists of questions or even a notebook with me: once the formalities of consent and ethics had been addressed, the conversations usually began by discussing something about my own lived experience as the wife of a permanent wheelchair-user. I knew, from the outset, that I would be looking for more than descriptions of practice. I tried to remain focused on letting the phenomena show themselves to me, with an open mind and one open to surprises too, rather than crudely pointing to phenomena I could not pre-determine (Reed, Hocking, & Smythe, 2010).[24]

Palmer (1969, p. 128) emphasises that in looking for the phenomena to come to the fore and to be revealed, we do not point to them; rather, we wait for things to show themselves to us. In establishing what a phenomenological interview would be like, Van Manen (1990, p. 42) suggests asking questions of the type: 'What is it really like to …?' In practical terms, this meant, for me, not asking brash questions (which I might have in other research strategies) such as: 'How does this technology enable you (or not) to …?' or: 'Are there barriers in this workplace or with this technology?' Rather, conversations were directed to allow these things to show themselves to me, with observations of technology use where possible. The question, arising out of the discussion, would rather be: 'How do you use your voice recognition software?' or:

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[24] REFLECTIVE NOTE: As the findings will show, my pre-conceived expectations did not yield the phenomena I had expected to find. I was anticipating finding barriers in workplaces but the reality was different. What was revealed were nuanced, more subtle meanings about the spatiality of work and the relational and holistic nature of things in it.

'What happened when you could not use the keyboard?' When a participant

demonstrated a piece of software or hardware adapted for their use, or when they said

they could not get into a meeting room as it did not have a ramp (P8)[25], or into a lift as

it was too small for an electric wheelchair (P1), the phenomena revealed themselves in

the form of affordances and barriers, allowing me to consider, albeit very

provisionally, the parts that would ultimately constitute a holistic hermeneutic circle

(as in Ilharco (2008)).

There were many pauses and frequent silences – which I used to let the participant

consider what they wanted to add next (Vandermause & Fleming, 2011). I was

constantly aware of not only what was said, but what was not said. As Palmer (1969,

p. 234) advises:

> it takes a great listener to hear what was actually said, a greater one to hear
> what was not said, but what comes to light in the speaking… it is necessary to
> go behind the text to find what the text did not, and perhaps could not, say.

Taking guidance from Finlay (2009) and Kvale and Brinkmann (2009) on this, by

cultivating a phenomenological attitude (and 'seeing afresh') in such conversations, I

aimed to listen and guide the conversation more than talk, in a sensitive way, with

questions emerging from the immediate context, rather than pre-determined. None of

the questions were biographical or personal – all were limited to revealing the

phenomenon in socio-material work practice (Cohen et al., 2007). Typically, although

I had initially asked for 'about an hour's chat' in my participant information sheet, the

recorded conversations lasted two to two-and-a-half hours. Having travelled far for

most of the interviews, I left all of them feeling that I had had a productive and

enlightening afternoon, with worthwhile data and intuitively knew that I would remain

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[25] Participant number = Pn hereafter

in contact with most of the participants through our common interest in the topic. These ongoing relationships have also illustrated that interpretations are never the final word and are always open to reconsideration and revision (Todres, 2007).

### 3.5.2 Operationalising the research

I was systematic about how I saved and treated each conversation. Consent forms were filed in a lever-arch file under the label 'participants', with each participant's emails filed accordingly. The same procedure was repeated for each participant. Voice recordings were saved on an encrypted key and digitally uploaded for transcription at a much later date. I bought a foot pedal to transcribe and did all the transcriptions myself, believing this an important task to relive the conversation and turn it into a verbatim text as 'raw data' for interpretation at a later date. Transcribing the work myself was a valuable exercise (also discussed by Rodham, Fox, & Doran, 2013). It enabled me to recall the tone and texture of participants' voices, the non-verbal cues and also the silences from which implicit meanings arose (Finlay, 2011).

Follow-up emails were used to check understandings and these became, over the months, less about the research and more about new friendships. I asked four of these participants, months after the initial conversations (in one case, over a year later), whether they would agree to send me photographs (with written consent, if they agreed) and preferably without their faces visible (to protect anonymity and confidentiality) of particular aspects of their use of digital technologies which I had seen (see *Appendix 4*). I did not ask for photographs at the initial observations and discussions, considering such a request at that early stage to be contrary to the principles of ethical data collection – and contrary to the spirit of emancipatory social research, too. Rather, when relationships developed in the following months, I felt that

I could ask four of the participants, and all agreed to email photographs, together with their written consent.[26] The request to these participants was made for three reasons: partly to show my reader more clearly what I perhaps could not express adequately in words, partly as photographic triangulation and verification, and partly as a creative way of presenting the data. Seamon (2000) advises that if a researcher is using media such as photographs in phenomenological work, the hermeneutic circle should be remembered – that new parts of the whole may offer new insights on other parts already considered. [27]

## 3.6 DATA ANALYSIS

I use in this study a method of data analysis which is a systematic (and auditable) way of deconstructing raw, unedited data into initial categories, then broader themes, in a process of revealing the phenomena. This kind of analysis is inherently relational, focusing on connections in socio-material practice (Nicolini, 2011). Examining practices this way is 'molecular' (T. Wilson, 2015) and mirrors Heideggerian methodological analysis as 'deconstruction' and 'reconstruction' into new interpreted meanings, provisional as they may be (Heidegger, 1962; Ilharco, 2008; Mulhall, 2005; Palmer, 1969).

Each individual participant gives unique data, in a process of 'making work visible' (Suchman, 1995). The purpose of chunking similar data together is to turn phenomenological disclosures into a text for interpretation. Once this process has been systematically completed, in its various phases, the data – now in tables – are ready

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[26] REFLECTIVE NOTE: These quick and positive responses strengthened my sense of moral responsibility vis-à-vis data collected, how to report the data and what contribution the photographs would add to the understanding of the topic – for my reader and for myself.

[27] This did happen. Participant 1 sent in photographs of herself in a new laboratory in a new job – using additional, different digital technologies to those I had seen when we had met a year earlier.

for the micro-analysis and synthesis stages from selections of that data. The micro-analysis stage connects the inter-related threads via theory and literature and the synthesis blends the output into the final interpretation as the parts relate to the referential whole (Ilharco, 2002; Introna, 2008).

As Cohen et al. (2007, p. 469 ) point out, the codes and categories, selections and deselections, whether chosen deductively or arising inductively out of the data, say more about the researcher than the data itself. I agree that this is a process determined by the presuppositions of the researcher and the performativity of research questions and methods (Law & Urry, 2004). Mostly, as Heidegger tells us, we come to a situation as pre-understood and ask questions about it which are in a world already pre-interpreted. In this way, we anticipate certain *kinds* of answers from certain *kinds* of questioning. These data become the text created by the researcher (in a particular time and place) from already fragmented speech in the original transcript. They are then further dissected and massaged into another format, for analysis and interpretation. Since this is the very text I have myself created, it always remains provisional and interpretive. Nevertheless, as Schwartz-Shea and Yanow (2012) advise, in the iterative and recursive relationship between data and theory, it is important to be open to different possibilities from emergent meanings. This is a particularly phenomenological view to data analysis and is a defining quality of phenomenological work – that the researcher is open to seeing the phenomenon as it appears in itself (also discussed by Finlay, 2011). Hermeneutics, understood this way, is 'really a theory of ontological disclosure' not grounded in subjectivity, but in the 'the historicality of understanding' (Palmer, 1969, p. 137).

The logic of my generic method converges with Finlay's (2011, p. 226), who advises that it is insufficient to collect data and report it simply as who-said-what - rather, one should engage actively in the 'labour-intensive phase of processing data and analysing meanings'. Her generic method of chunking the data includes a reflective phase of engaging with data, stepping back from it and reflecting upon it as 'reflection-upon-action' (Schön 1987, p. 3). I found myself in this situation, with a period of over a year between the first and final discussions with participants, and was able to dwell, for months at a time, on the original transcripts, forming and reforming initial provisional interpretations which enabled connections to be made early on between the data, although provisional themes were not apparent until all of the data were systematically chunked and funnelled for a thematic analysis. This process also confirmed Yanow's (2000) contention that the activities of researchers become a collection of fragmented bits of local knowledge (for further interpretation) later on.

In accordance with standards of rigour in data presentation, methods should be rigorous and transparent, data sufficiently rich and appropriate to answer the research questions and the relationship between data and results of the analysis coherent and clear (Trowler, 2012d). By the time the data appeared in the text in this document, the phenomenon had revealed itself in the course of the data collection phase. Palmer (1969) guided my thinking on this: we do not point to the phenomenon. Rather, things *show themselves* to us. That is, the kind of thinking that opens the researcher to the possibilities of what will be revealed and what is brought to light is what then becomes a reified text for interpretation.

One purpose of presenting verbatim data as described by the participants (and before being interpreted by the researcher) is to allow the reader to see exactly what the

researcher uncovered – and before 'phenomenological intuiting' takes place (Seamon, 1977, p. 16) and I do this in Chapter 4 below. While the reader may disagree with my interpretations thereafter (in Chapter 5), I would like to be able to show the logic of the process of evidence-to-interpretation in a transparent way that constitutes a credible and plausible research effort (Lincoln & Guba, 1985). Early (but provisional) analysis began at the discussion/observation stage. As Kvale and Brinkmann (2009, p. 190) advise, analysis should be 'as you go' since:

> the ideal interview is already analysed by the time the sound recorder is turned off.

There were five phases of my data analysis process explained in Table 3.1 below.

### 3.6.1 The phases of data analysis

**Table 3.1:** Phases of data analysis

| Phase I | Phase II | Phase III | Phase IV | Phase V | Phase V |
|---|---|---|---|---|---|
| Transcribe *raw data* to create main database | Assign record numbers to *selections* of verbatim, unedited data in table | Free textual analysis forms emerging *categories* | Categories grouped *thematically* on mind-map | *Micro-analysis* of themes building on prior research | *Synthesis* |
| *Appendix 8* | *Appendix 9* | | *Appendix 10* | *Chapter 4-Findings (evidence)* *Chapter 5- Discussion* *Chapter 6- Conclusion* | |

A more detailed description of the five phases follows.

**Phase I**

Initial, contingent interpretation has already begun prior to this phase. Phase I comprises transcribing and creating the main databases of the full, verbatim and unedited transcripts (see *Appendix 8*).

**Phases II and III**

Selections of verbatim, unedited speech are chosen for a new table (Phase II) with columns for Phase III, using keywords or phrases that indicate the essence of a category (see *Appendix 9*).

**Phase IV**

This phase is done in mind-map format. Similar categories are grouped and further funnelled into potential *themes* which comprise the phenomenon as observed and/or recorded. Although Finlay (2013) advises that the goal in phenomenology is not to search for themes, but rather to explicate the phenomenon, one still needs to aggregate one's data to make sense of the phenomenon (see *Appendix 10*).

**Phase V**

In this phase, the data are firstly thematically linked to prior research, literature and theory in this text, then synthesised into a further holistic interpretation, using theory, in order to draw the research to a conclusion. Interpretation at this stage can be understood as appropriation: 'making one's *own w*hat was originally alien' (Ricoeur, 1981, p. 159). Seeking 'interpretive plausibility', Lavoie (2011, p. 101) also involves disclosing hidden meanings revealed as concrete realities in this text (Guignon, 1993). Nevertheless, as Hirsch (1967, p. 249) advises, the meaning of the text is a 'never-exhausted array of possible meanings lying in wait for a never-ending array of interpreters'.

### 3.6.2 Phenomenological writing

Kvale and Brinkmann (2009) talk of the 'craftsmanship' of writing qualitative research in general and Finlay (2014, p.121) talks specifically of the contextual and

emotive 'languaging' of phenomenological accounts. In doing so, I recognise that writing phenomenologically is probably best done as autobiographical narrative; for example, Toombs (1992) on being a person with a chronic illness, Zola (1982) on being a polio survivor and Michalko (1999) on being blind, while Kestenbaum (1982) and Van den Berg (1972) analyse the phenomenon of illness from their interpretations, as medical professionals, of patients' lived experience. In order to meet academic writing standards and convey to others what the phenomena were, as revealed and thereafter interpreted by myself, I am constantly aware not only of Wenger's (2011) consideration as to what kind of story one wants to tell, but of whom it is being told and for what purpose. To convey the participants' voices, I use verbatim, unedited quotes, to reflect the authentic character, texture and tone of the participants' voices. I have made particular efforts to use Heideggerian terminology correctly and in a descriptive, evocative way, heeding Lovitt's (Heidegger, 1977, p. xx) words in the introduction to *A Question of Technology*:

> the words [Heidegger's] are not intended to mystify his readers or to attract devotees who will facilely repeat esoteric speech.

## 3.7 ETHICAL CONSIDERATIONS

Social research is, for me, an ethical and reflexive endeavour – an opportunity not only to investigate meaningful social phenomena, but also for self-reflection and awareness of my moral self. Many decisions and subsequent actions in the practice of empirical research do not depend as much as on 'what is going on here?' (Silverman, 2006, p. 66), but rather on 'what is right here?' and 'whose interests are best being served by my actions here?'

### 3.7.1 Principles and goals of ethical research

'Ethically responsible research practice' (Silverman, 2006, p. 323) is not, in my view, merely a matter of compliance with university rules. Nor is developing a sense of 'moral competence' (Johnsson, Eriksson, Helgesson, & Hansson, 2014, p. 43) a simple matter of obtaining 'one-off approval' (Parsell, Ambler, & Jacenyik-Trawoger, 2014, p. 176) from academic ethics committees. Consenting to rules, guidelines and specific requirements set by ethics committees in universities reflects the spirit of 'institutional distrust' (Johnsson et al., 2014, p. 30) of researchers, which does not, in and of itself, engender the development of heightened moral and ethical awareness. My view of this has been to recognise the normative nature of research practice, in that the student researcher *ought* to be constructing the research project with an emphasis on axiology and values (if shaped by previous life experience and values (Lincoln & Guba, 1985; Tregaskis & Goodley, 2005)). A Heideggerian phenomenological view of this is that the researcher, in such practice, explicitly engages with pre-understandings (not understood as biases) which are shaped by their own ontological histories over time (Heidegger, 1962).

The goals of ethical research practice are naturally in place mainly to protect the participant. However, Lankshear and Knobel (1997) question for whom the practice of box-ticking (required by ethics committees) is in place – the participant or the institution. According to Johnsson et al. (2014), checklists and box-ticking do not prepare researchers in any way for unexpected moral dilemmas. Privacy, confidentiality, anonymity, non-traceability and the right to withdraw from the research need to be guaranteed to the participant as part of an approach that values integrity, quality and transparency (British Educational Research Association, 2011).

Voluntary participation and informed consent are additional requirements. I am of the opinion that ticking the requisite boxes is insufficient to ensure an ethical endeavour and that there should, at least, be ongoing monitoring and compliance during the project, not merely at the beginning of it (Parsell et al., 2014). Moreover, I am in agreement with the view of Johnsson et al. (2014, p. 29) that unless the researcher already has a 'capacity for moral judgment', university guidelines and rules are not going to teach students any sense of ethical awareness.

### 3.7.2 *With* people, not *on* people

The social model of disability is directly associated with emancipatory research (Barnes, 1996, 2003, 2012; Bury, 1996a, 1996b; Goodley et al., 2012; Goodley & Moore, 2000). Both have origins in a notorious action research project commissioned by disabled residents of the Le Court Cheshire home for physically disabled residents in 1966 in the UK. The residents had commissioned the research to investigate ways in which they could exercise more control over their own lives in the care home. The ensuing report fell far short of the findings which the residents had expected. The report, later turned into a book, used pejorative language to describe them: 'inmates' (p. 63), 'cripples' (p. 72), 'incurables' (p. 85) and 'rejects' (p. 82), as well as nominalisations to describe them as 'the incurables', 'the dependent', 'the rejected' (p. 127) (Miller & Gwynne, 1972). The researchers showed clear bias in favour of the staff. In particular, the methods of data collection revealed that the research was done *on* people, not *with* them. This betrayal of trust (not only in the writing of the report, but in the content as well) led to the creation of the Union of Physically Impaired Against Segregation (UPIAS) by a group of disabled activists which became the catalyst for change and subsequent legislation. UPIAS viewed disability not as a

medical or sociological issue, but rather as a political one in which disability was seen as a type of social oppression. Not surprisingly, there was heavy criticism of the methods of social research concerning disabled participants, leading directly to the emancipatory research paradigm and calling into question the very role of the non-disabled researcher.

### 3.7.3 The role of the non-disabled researcher

I feel that in the conversations with participants, I enter into a 'personal and moral relationship' (Holloway & Freshwater, 2007, p. 54) doing research *with*, not *on* people (French & Swain, 1997). Having said this, I nevertheless recognise a very real potential for unethical, parasitic and voyeuristic practices, especially in methods of data collection, which can occur in this kind of research (see also Stone and Priestley, 1996). My ethical responsibility lies in accountability to the participants primarily (and to my university) and not to the disability movement as a whole – even though I subscribe to the basic tenet of the social model, that society erects barriers that amount to disablement. This reflects the tension between the principles of methodological ideology and the practicalities of empirical research (also found by Imrie, 2014). My view has been guided by Shakespeare (1996) in his capacity as an academic (and a disability activist) who maintains that it is important for the researcher to retain choice and control of the research process, rather than to surrender this control to 'co-researchers'. By following Shakespeare's (1997) lead on this and trusting my own ethical standards, I do not feel a need to conform to the orthodoxy of emancipatory research when I cannot offer what it demands of the researcher. Even if I were able to offer this, I am not convinced that participants of research are necessarily the right people to interpret (through theory) their own data (considered also by Giorgi (2008)

and Geertz (1979)). At the end of the research process and shortly before submitting this work, the participants were all supplied with a summary of the research findings, as promised, by email.

### 3.7.4 Ethics in practice

However, having said above that my ethical responsibilities had clear boundaries delimited by my participants (and their data) and my university (and its rules), I came to realise at the end of the process that I do, in fact, have a broader responsibility to other researchers as well. I realised that my work may be inaccessible and present the very kinds of barriers which I was exposing in workplaces. Notably, that there would be barriers to researchers with limited vision who might want to read this document. In this case, barriers would include taken-for-granted assumptions that certain items (for example, photographs and tables) are not readable. Furthermore, this might even be justifiably explained as 'the way things are' (especially with regard to documents in 'portable document format' (PDF)). To counter this, I have made efforts to make this document accessible to people with low or no vision and who use screen-reading software (for example, 'JAWS' (Job Access With Speech) or Zoom Text). To make the document accessible, I have used 'Alt Text' in the digital version of this document, so that graphics, tables, arrows and non-text items are described textually and can be read on different platforms. Alt Text allows screen-reading software to read these descriptions aloud as text instead of having to skip over photographs, tables, arrows and other non-text items as unreadable (see *Appendix 11* for explanations to sighted readers on how this works; also see *Appendix 4*). Alt Text is added to these non-text items through accessing their digital properties – and is very easily done. This is also probably the best way of demonstrating my commitment to

an ethical research effort as well as giving some of my participants the option of reading this research considering the important role they have played in creating it.

### 3.7.5 The ethics of listening

One particular focus of the phenomenological method is the phenomenological interview (Finlay, 2009) and in this regard, Goggin (2009) draws attention to the ethics of listening. To whom one listens and how one listens (partially or selectively) also have moral consequences (for rigour and, ultimately, for one's interpretations). Paley and Eva (2005, p. 83) suggest 'narrative vigilance' when listening. While phenomenology is not compatible with triangulation, I do feel a responsibility to try (as far as possible) to verify statements during conversations, sometimes by asking the same questions in different ways. Ethically responsible research is a research effort which shows integrity – not only to my participants, but also to my readers, who – while they may disagree with my findings – will at least see that I have made efforts to collect, analyse and interpret data in a plausible and credible manner (Lincoln & Guba, 1985).

### 3.7.6 The ethics of researching difference

Moser (2005, p. 685) asks a valid question: 'What difference does difference make?' Although researching difference is not the focus of this study, the ethics of researching sameness and difference do need to be addressed, as they are a recurring thread running through disability studies. The ethics of considering sameness and difference hinge on the explicit and tacit meanings embedded in what is considered normal and 'abnormal' – that is, defective, deficient and devalued. Humphrey (2000) contends that by focusing on such oppositional binaries, what is lost is the recognition that *all* people (not only people with impairments) have unique life stories, and that *everyone*

is uniquely different. The social model of disability views disability as a political act of oppression through societal barriers (physical and attitudinal) and does not in any way acknowledge sameness or difference. But, as Russell (1998, p. 233) points out, we cannot dismiss difference, for:

> to move beyond ramps, we must first agree that ramps are indisputably necessary.

Respecting the social model was the reason that I was not prepared, from an ethical perspective, to consider a sample *based* on particular medical conditions. Instead, I chose one where people experienced the *same phenomenon* (their use of technology at work), to see what impact mobility impairments had on their ability to participate in work practices. Terzi (2004) points out that by ignoring the embodied binaries of sameness and difference (as in the social model of disability), one logically denies that diversity is to be valued at all.

By regarding disability as a way of perception and a form of interpretation that devalues embodied difference, by examining and bringing to the fore unexamined relations in the world, one can research how some bodies are assumed to be naturally lacking access and therefore excludable (Titchkosky, 2011). From a phenomenological methodological perspective, making this empirically practicable requires bringing to the fore that which appears natural in the relationship between disability and lived space (in this case, the lived space of participants' workplaces).

All of these ethical concerns and, in particular, my role as a non-disabled researcher, are kept in focus throughout the project, not simply at the beginning of it. Ethical issues are also foregrounded in choosing the sample from a population which is not clear, homogenous or particularly easy to reach, as empirical work was soon to reveal.

Shildrick's (2009, p. 1) view of labelling as disabled reminded me of the difficulty of using the social model for empirical research when it ignores physical impairments, making choosing a sample inherently problematic, since:

> To be named as differently embodied is already to occupy a place that is defined as exceptional to some putative norm, rather than to simply represent one position among a multiplicity of possibilities.

Thus the ethical issues of choosing a sample of people with impairments are essentially fraught with difficulties if one wants to adhere to the tenets of the social model *and* investigate phenomena with people who have physical impairments, because – as Crow (1996, p. 58), in a critique of the social model says – 'impairment is safer not mentioned at all'. Nevertheless, in practical research, it is an ongoing, always-present and interpretive issue, even when using a social barriers model, as one theoretical lens in the hermeneutic circle of interpretation.

## 3.8 SUMMARY AND NEXT CHAPTER

This section has outlined how the research was operationalised. I have explained the methods of data collection (discussions and observations) and analysis, a five-phase strategy I have used before. I explained my sampling strategy and the difficulties I had locating a sample based on my criteria. In addition, I explained my use of theory and why I consider paradigmatic alignment in theory to be important. I outlined my use of Heideggerian phenomenology as a research strategy and ended with a discussion of ethical considerations in my work.

The following chapter is Chapter 4, the Findings, and it presents the evidence, as selections of illustrative verbatim quotations from the data, with brief paragraphs describing the six themes. This evidence answers the first (descriptive) research question which asks how participants use their digital technologies at work.

# CHAPTER 4 - THE FINDINGS

## 4.1 OVERVIEW OF THIS CHAPTER

This chapter presents the data in the form of six themes which emerged through the process of data analysis. I begin by describing the phenomena as seen, and as such, answer the first descriptive research question which asks how professional and managerial-level personnel, with mobility impairments, are using digital technologies in the course of their work. The themes are presented using an explanatory paragraph or two, followed by examples in the participants' own voices, as evidence for that theme. These are repeated in Chapter 5, where I use the same themes, in the same order, to link the themes to prior research, as identified in the literature review, to add layers of interpretation.

### 4.1.1 THE PARTICIPANTS

The table below (*Table 4.1*) summarises data from the 11 participants in five columns: job description, digital technologies in use, general comments, mobility aids and flexible work arrangements. General comments in the table include data where participants shared information about their health or impairment. All of the participants have mobility impairments and seven of them are permanent wheel-chair users, unable to walk at all. One participant has a variable visual impairment and two others have mobility impairments, together with visual impairments. Some work from home, while others work at their employers' premises ('standard offices').

**Table 4.1:** The participants

| Participant number | Job description | Digital technologies in use | General comments | Mobility aids | Flexible work arrangements |
|---|---|---|---|---|---|
| 1 | Histopathologist /head of department | Automatic stage microscope/joystick Dragon Naturally Speaking software Dictation arm on wheelchair Customised software for pathology reports Standard Microsoft software Standard computer and laptop Standard keyboard | Female. University graduate. Self-declared: leg amputated due to cancer. Limited use of hands | Electric wheelchair | Hospital-based employee Reduced hours, one day a week working from home, starts later than colleagues in department (changed work thereafter and appointed head of department of 84 consultants and staff in a different hospital) |
| 2 | Equalities consultant | JAWS screen-reader Dragon Naturally Speaking software Voice-over-Internet Protocol (Skype) Standard Microsoft software Standard computer and laptop | Female. University graduate. Major health issues requiring frequent stays in hospital. Also blind. Requires high levels of support, as well as carers | Wheelchair with leg extensions; support worker pushes wheelchair | Home-office; self-employed |
| 3 | Journalist | Standard Microsoft and other hardware and software Industry-specific software | Male. University graduate. Self-declared: cerebral palsy. Limited use of hands | Crutches | Office-based; self-employed |

| Participant number | Job description | Digital technologies in use | General comments | Mobility aids | Flexible work arrangements |
|---|---|---|---|---|---|
| 4 | Personal injuries solicitor | Dragon Naturally Speaking software<br>Standard Microsoft and other hardware<br>Standard keyboard<br>iPad<br>headset | Male. University graduate. Self-declared: tetraplegic; spinal cord injury due to diving accident. Limited use of fingers | Manual and electric wheelchair; uses adapted mobility van to self-drive | Practice-based employee |
| 5 | Recruitment executive | Standard Microsoft software and hardware | Female. University graduate. Self-declared: degenerative spinal condition | Cannot sit; has to lie flat with computer suspended above her; limited standing with a neck and back brace | Home-office, self-employed (social enterprise business) |
| 6 | Town planner | Standard Microsoft software<br>Dragon Naturally Speaking software<br>Plantronics headset adapted magnetically<br>Head-mouse for dwell-clicking<br>Other mainstream software | Male. Self-declared: cannot use muscles or hands; male personal assistant in the office. Requires high levels of support and carers. Impairment since childhood | Electric wheelchair, mobility van for carers to drive | Home-office, council employee |
| 7 | Vocational support officer | Standard Microsoft software<br>Standard hardware and laptop | Male. Self-declared: spinal cord injury due to illness | Manual and electric wheelchair<br>Adapted mobility car to | Mostly home-based, employee of charity, travels to counsel |

| Participant number | Job description | Digital technologies in use | General comments | Mobility aids | Flexible work arrangements |
|---|---|---|---|---|---|
| | | | | self-drive | clients |
| 8 | Director of complaints manager | Standard Microsoft software<br>Standard hardware<br>Laptop<br>Foot pedal for transcription | Female. University graduate. Self-declared: chronic spinal muscular atrophy and other health conditions; limited use of hands | Electric wheelchair<br>Adapted mobility car to self-drive | Hospital-based employee |
| 9 | Administration officer | Lightning magnification software<br>Zoom Text<br>CCTV reader<br>Standard hardware<br>Standard software | Female. Self-declared: visual impairment affecting mobility | Taxis to and from work | Office-based employee, some remote work |
| 10 | Project manager and IT trainer | Zoom Text<br>JAWS screen-reader<br>Kurzweil text/speech software<br>Standard software<br>Standard hardware | Female. University graduate. Self-declared: visual impairment affecting mobility | Taxis to and from work; occasionally uses a long cane | Office-based employee, some remote work |
| 11 | Chartered accountant | Standard software<br>Standard hardware<br>Voice-over-Internet Protocol (Skype)<br>Telephones and headset | Male. University graduate. Self-declared: childhood polio, limited use of hands | Manual and electric wheelchairs<br>Adapted mobility van to self-drive | Home-office and practice office, self-employed |

## 4.1.2 THE DATA

To summarise from Chapter 3 above, in Phase 1 of the analysis, I created the main database from the transcribed data. In Phase II, I reduced the data by selecting passages of text which I thought would be relevant for answering the research questions. In Phase III, I employed a free textual analysis technique that functioned as initial coding into categories. Repeated frequencies of categories were chunked and reduced into emergent themes on an A3-sized page as a mind-map in Phase IV, to identify main themes arising out of the phenomena for further analysis. The six themes are interconnected - the first three will lead to an understanding of the spatiality of work and the last three, the socio-materiality of it.

The flow of logic here, and revealed as phenomena, was that as people with mobility impairments identify in different ways through what they do in practice, *where* they work and *how* they work is of primary importance. The data below broadly show that what they do to make things usable in socio-material practice arises from what they learn in the non-formal learning arena of workplaces. The descriptions in the six themes answer the first research question, which asks how professional and managerial-level personnel, with mobility impairments, are using digital technologies in the course of their work.

The six themes are:

Theme 1 – *Being* a worker with a mobility impairment
Theme 2 – Flexible work arrangements – spatiality and work
Theme 3 – The built environment
Theme 4 – Reliance on technology
Theme 5 – Learning in practice
Theme 6 – Doing things differently

The evidence for each of the six themes below is preceded by a short description of the theme. Quotations are presented below as evidence, with the participant (Pn) and record

numbers for reference as these are used later in Chapter 5 where I refer back to these 73 excerpts below.

## 4.2 THEME 1: *BEING* A WORKER WITH A MOBILITY IMPAIRMENT (Records 1-14)

Theme 1 is concerned with how the participants position themselves, both as workers and as workers with mobility impairments. *Being* disabled or *becoming* disabled was discussed with all participants, not in terms of their impairment *per se*, but in terms of what it meant *being* a person with a mobility impairment in their workplaces. This exposed the ontological and temporal nature of disability, sometimes in terms of how they *were* before the illness or impairment, and *presently*, at the time of the conversation.

**Quotation (Record 1)**

The first quotation locates this participant's impairment ontologically.[28]

| | |
|---|---|
| My impairment is very much part of who I *am*. And it's like cutting a piece out of you. If you say: 'I'm going to cut that bit of me away...' you're cutting that bit of me away! It's *my* reality... it's not a bad *place* to be. It's a *different* place to be. (P6) | 1 |

Three other participants expressed that they *became* different people through their impairments and that there was a temporal aspect to becoming disabled.

**Quotations (Records 2-4)**

| | |
|---|---|
| When you left home, prior to your injury, you were able-bodied and everything was fine and then you had your car accident … and so you come back as a different person. (P7) | 2 |
| Before I was disabled, I did a lot of driving up and down the country, talking to employers. And a lot of standing, because I would do a day's | 3 |

---

[28] REFLECTIVE NOTE: With this kind of data, it is difficult to conceptualise how the social model does *not* take either the individual or the body into account. But it is *equally* difficult to conceptualise how scaling up phenomenological research for policy could be a workable alternative (as in Schatzki (2014, 2015)).

| | |
|---|---|
| training course .... Then, all of a sudden, I can't drive, I can't stand and I can't sit. Suddenly different! (P5) | |
| I had to give up work just *because* I couldn't walk! There were lots of things I couldn't do when I went from being a non-disabled to a disabled person. Being a wheelchair-user has never been an issue for me. I can find ways around my impairments, but I can't control my variable health. But I understand what it's like being non-disabled first and then becoming disabled. (P2) | 4 |

For some participants, their disabled identity was directly related to using a wheelchair.

These participants also said that once in a wheelchair, they felt a need to 'fit in' with their

non-disabled colleagues.

**Quotations (Records 5-7)**

| | |
|---|---|
| And I think that the wheelchair makes a big difference when you go gradually from crutches to manual wheelchair and then I went into an electric wheelchair at work, but not at home, and then I had to go quite rapidly into an electric wheelchair at home as well. Being on crutches, I wasn't really disabled in a way, or I didn't feel like I was, whereas once you get into a wheelchair, it was about fitting in differently in terms of space and in terms of other people. (P1) | 5 |
| When I was on my crutches, I almost pretended I wasn't disabled and you just got on with it. You kind of almost don't want to admit you're disabled and you just want to fit with everybody else. But then it came to a point where I couldn't fit in with everybody else, particularly with the electric wheelchair and I did need more serious adaptations than had been done previously. I needed adaptations in the laboratory and in my office and it impacted others, not always positively. I was made to feel that funds were being diverted to pay for this and I was told so, too! (P1) | 6 |
| I've designed my life to work from home, not an office where I can't have these necessary facilities. In an office I was dependent on other people to come and go, letting me in and out. If someone goes early, I'm beholden to them and had to leave when the office was locked up. Whereas I shouldn't have to do that, but that's part of being disabled … you have to fit in with other people broadly. (P11) | 7 |

Not only did they feel a need to 'fit in', but they felt a need to 'prove' their competence in

practice *because* of their disabled identities.

**Quotations (Records 8-10)**

| | |
|---|---|
| I feel as though I have to *prove t*o the world I'm *just* as good as someone who isn't disabled. And I shouldn't *have* to do that! I should be taken on merit like everybody else is taken on merit. But there is that kind of over-achievement – that you feel you have to prove to others and yourself that you are as good as other people. It's wrong, but it's there. (P5) | 8 |
| For me it was a case of 'actually, I'm not as good as everyone else.' I went through a phase of that. I'm not any good at *anything*. Then I went through *another* phase of 'Oh, well, everybody else, nobody else really bothers about good-quality work at work.' Disabled or not! And you just do what you have to do and you get paid. Until I tried that for a little while – and that back-fired on me.<br><br>Then I think it was probably early 2000 or [the] late '90s – about *proving* that I could do it. I could do it, and I will do it! And I will *show* them. And I *will* get that promotion. And I *will* get that pay-packet. I'm past that now. What I do now... it's not about proving. I just have targets to meet and I meet them. But it's not about proving anymore for me. (P6) | 9 |
| I take a bit more time to do things and so in order to get all that work cleared up, I'd likely need to get into work on a Saturday. Yes, partly to prove to myself that I could do the job and also partly because everybody else was catching up on a Saturday as well. (P4) | 10 |

Proving themselves as being competent *because* of their disabled identity was a matter of annoyance for the participants (and something unexpected to me). The link between walking and working aroused indignation in these participants, mostly because they expressed disdain for the idea that there is a perceived link between mobility and competence at work.

**Quotations (Records 11-14)**

| | |
|---|---|
| I don't consider myself to have a disability. I've got a condition, but I don't consider myself to be disabled. My legs don't work, but up here *[points to head]* they do! (P8) | 11 |
| My sort of attitude was, really, for a pathologist, I need my eyes and I need my brain, but the rest of it somebody else can do, really. (P1) | 12 |
| I don't need legs to make telephone calls. You need a voice and a personality. If you're mute, you can't be a telesales person, but if you use a wheelchair, there is no reason at all why you can't. (P5) | 13 |

| I've been a non-disabled person and a disabled person – I've never understood the mentality that because someone's legs don't work, that somehow they've lost their capacity to think for themselves. (P2) | 14 |
|---|---|

Fitting in and *being* a competent practitioner has links to the organisation of spatiality in the work environment, the following theme.

## 4.3 THEME 2: FLEXIBLE WORK ARRANGEMENTS – SPATIALITY AND WORK (Records 15-30)

Theme 2, arising out of the data, is concerned with both the spatiality of work and the placement of objects in the immediate work environment for workers with mobility impairments.

Some participants stated that they could *only* work from their home office and could not work in a standard office at all. Spatiality at home and in the office turned out, in the data, to be related to the usability of that space, or not. Some workers worked in standard offices, but had also adapted the environment to suit their physical requirements in order to overcome potential physical barriers in that work space. Making space usable also includes configuring the placement of artefacts in this space to be usable rather than being obstacles and barriers. Certain configurations of modes of employment (self-employed or employed) enable work practices of flexible work arrangements in different spatial configurations (for example, office or home office).

**Quotation (Record 15)**

| Because of technology, I can create my own space. I spend a lot of time sitting and my equipment is all arranged to suit me in a comfortable work space. Where I have my stuff is where I need it. (P3) | 15 |
|---|---|

The world of work is a 'whole little world'.

**Quotations (Records 16-17)**

| | |
|---|---|
| At home, I've created a *whole little world*. It's a *world*, it's not just a job from 8 to 5 and when you're disabled you live in a world as well, where things are accessible or not accessible.<br><br>And when they're not accessible, it can frustrate you, it can irritate you, it can annoy you, it can dampen your day or your life, so it's all that. (P11) | 16 |
| When I was in a job in London, there were no allocated desks. You sat wherever there was a berth, even me, in a wheelchair. I had to sit wherever there was a space. I was always manoeuvring. The phone would be that side this time, or that side next time, and I can't get in here, or I'd sit at the corner of a desk, in an uncomfortable position.<br><br>Then they announced they were moving offices that had a spiral staircase and *no lift*! Unbelievable! So I couldn't work there any longer, obviously. Horrible place, horrible, thoughtless people! (P11) | 17 |

A few participants stated that they could *only* work from a home environment. In records 18 to 20 below, participants 2 and 5 are self-employed; participant 6 is employed.

**Quotations (Records 18-19)**

| | |
|---|---|
| I haven't effectively worked inside an office, a standard office, since 2000.What I do have to say is that working from home is the *only* way I can work. I have very high support needs and have had for many, many years.<br><br>This environment enables me to be productive. OK? But not only that, this environment *facilitates* my abilities. Whereas the environment outside that front door impacts and *limits* my abilities! Because I have to spend all my time negotiating that very difficult world out there. (P2) | 18 |
| I don't think I would be able to work full-time without my home office. I work every other day from home, which allows me to physically recuperate while still getting my work done …. Now, with the Internet, an accessible vehicle, personal assistants, flexible working from home, a warm environment, freedom to use the loo, and drink and eat, I can usually manage ten hours per day, when needed. Working from home, however, really does bolster my stamina. (P6) | 19 |

**Quotation (Record 20)**

Not being able to sit at all, I have to lie 23 hours out of 24. I run my business from my bed because I have a degenerative spinal condition, which means I can't sit, can't stand for very long, can't walk very far. So I lie on an electronic bed …. Then I have the laptop suspended above me. So it's on an arm that comes across my bed, so it's literally suspended above my tummy and then I use the laptop like that. (P5)/*See figure 4.1*



**Figure 4.1:** Participant 5 running her business from her bed. Copyright (2016) (Copyright holder withheld for ethical reasons.) Reprinted with permission

Home offices are configured spatially to work around people's impairments. These adaptations enable participation in their work practices.

| | 21 |
|---|---|
| **Quotations (Records 21-24)** | |
| I use more than my computer. I use my environment here. Because it starts off by me having to be physically comfortable and suited to my work. So it's not just the tools. It's the rest of my *world* that I live in with regard to coping with my disability and where I feel at my most comfortable. In my home, it's all organised in a way that I can get to files easily. In an office I'm restricted by space and other features that may not be suitable for me. Theoretically, I can work anywhere, but I prefer my own environment where the desks are kitted out, everything's the right height for me. I've got to have the *rest* of it to make it all work. Decked out exactly to suit me. I've learnt that with space, it's a space where you work and I like being able to work remotely. I've designed my life to work from home, not an office where I can't have these necessary facilities. Bathroom! A *major* reason for me working at home. (P11) | |

| | |
|---|---|
| People are concerned how they're going to manage in the workplace and what happens if they do have a bowel or a bladder accident because of being doubly incontinent … how'm I gonna manage this? I *have* to have the flexibility of working at home. (P7) | 22 |
| When I first became disabled, I also had a height-adjustable desk so that if there were things that I couldn't do lying down, like handwriting, I would stand at the desk and the desk was at standing height for me. I did that for seven years. (P5) | 23 |
| I need to slide my hand along, spider-style, because my shoulder muscles have gone, to move my hand, to use my mouse. So the position of my wheelchair and the height of my desk are critical and the ratio of where I sit under the desk to the desk is absolutely essential for my comfort. (P11) | 24 |

In addition to being physically comfortable, people need to access the objects in workplaces.

**Quotation (Record 25)**

I have things accessible to me in the laboratory. There's a height-adjustable 'cut-up bench', an automatic stage on my microscope and a dictaphone on my armrest which I operate with my elbow. And a ramp to get into the laboratory and doors that stay open electrically. I *have* to have these things where I need them**. (P1)/*See figure 4.2*



**F**igure 4.2: Participant 1 in the laboratory, with her height-adjustable 'cut-up bench' and with her elbow-activated dictaphone. Copyright (2016) (Copyright holder withheld for ethical reasons.) Reprinted with permission.

**Quotations (Records 26-30)**

| | |
|---|---|
| I need my stuff very near me, exactly where I want my things. (P9) | 26 |
| Everything has its place here. Where I can reach what I need, when I need it. (P10) | 27 |
| The most important issues around working in an office for me are good lighting and well laid-out furnishings. Poor lighting causes trip hazards for me due to the lack of contrast. I have to have space to move around and store items … it's essential for safety. I just can't have obstacles around me. I need my things where I place them and there is a reason for placing them there. (P10) | 28 |
| In terms of having my equipment close to hand, this is vital, as I am now not able to self-propel my wheelchair. However, as I am fortunate to have support staff, if something isn't nearby, then I can always ask someone to get it for me .... If something is moved from where I expect it to be, I would need assistance for someone to get it for me. (P2) | 29 |
| It's so much easier to be manoeuvrable as an able-bodied person…. For example, my printer at home is beside my desk, whereas here in our head office, it's on the other side of the building and so I have to go and fetch everything. Which just takes that little bit longer than if I could walk or had the printer next to me. As I write this, I have my laptop, printer, two mobile phones and a landline, two memory sticks and a pile of paperwork within arm's reach. (P7) | 30 |

In addition to the spatiality of the workplace and the positioning of things in it (as 'private' built environments of workplaces), the issue of the 'public' built environment and accessing public services, transport and buildings was an issue raised by nearly every participant. This led to the following theme which concerns the accessibility of the built environment.

## 4.4 THEME 3: THE BUILT ENVIRONMENT (Records 31-37)

Theme 3 is concerned with the built environment and how environmental barriers can directly impact people's participation in social practices. Sometimes environmental barriers are tolerated, sometimes practices are changed and sometimes people are excluded from participation, as these examples all illustrate.

**Quotations 31-33**

| I'm no fan of the London transport system, being on crutches. So I did some research on the Internet and found a grant that was going and talking to colleagues in the industry and I moved to York. I couldn't easily get around London. (P3) | 31 |
|---|---|
| When I was on crutches when I was younger, I couldn't walk on *any* wet surface. Wet weather, snow! The enemy of us folk in wheelchairs! An added difficulty of getting to work in a wheelchair. Whether by car, bus or taxi, it's all the same in wet weather. Another reason I like working at home. (P11) | 32 |
| Damaged pavements, A-boards, bins and general street furniture, as well as bikes, animals and people wheeling cases behind them are all an issue for me on pavements. So I've started using taxis through Access to Work and working from home as well to answer emails. (P10) | 33 |

Sometimes, facilities in workplaces are not placed in near proximity to where they are needed.

**Quotations (Records 34-35)**

| The disabled loo at work was very far away… a long corridor – and when I was working as a trainee, when I went around four different departments, and there was only one disabled toilet which was not that far away from where I ended up working, but for the other three (departments), I had to go up in the lift, then across to the next building just to go to the loo. (P4) | 34 |
|---|---|
| I can't use all the toilets at work. I can't transfer easily from my wheelchair because the controls of my wheelchair are on the left and it depends on the layout of the toilet. At home, my mother helps me with my personal care needs before I come to work. (P8) | 35 |

Two examples of practices which had the direct effect of excluding the participants relate to obstacles that served as barriers to participation in their work practices. Both examples below relate directly to the participants' job roles which they were unable to fulfil *because* they were excluded physically. Neither of the participants questioned why the meetings could not be held in accessible venues, because they wanted to 'fit in' with their non-disabled worlds of work. Both reported, when I asked them months after these incidents, that nothing had been done to change the venues which excluded them from participating in their work practices.

**Quotations (Records 36-37)**

| | |
|---|---|
| I rang up to see if they've got wi-fi in that meeting room. And I just dropped it in, I went: 'Oh, I'm disabled as well, so which lift do I have to use to get up?' She went: 'Ummm *[pause]* ... you in a wheelchair?' I went: 'Yeah.' She went: 'I don't think there's any access. There's some steps to that meeting room.' <br><br> So we had to resort to cover from someone else to go to take the minutes of that meeting, not me. And it's *my* job to take the minutes at meetings! It's in my job description! (P8) | 36 |
| Courses aren't necessarily held in accessible places and my own Royal College is in an old building on Carlton House Terrace in London and I can't get in it with an electric wheelchair because the lift from the basement area that you've got to come up in is too small to fit an electric wheelchair. And that is not fair. <br><br> [As a result], I don't attend the gynae external quality assurance meetings that are held there and it means that I can't *really* be involved in college life. And one of my responsibilities is quality assurance in my department. (P1) | 37 |

Spatiality and access to the built environment is complemented by the placement of objects in the work spaces and I focused on digital technologies (more than office furniture, for example) in the pursuit of answering my questions. Many of the participants were completely reliant on fully functioning digital technologies.

## 4.5 THEME 4: RELIANCE ON TECHNOLOGY (Records 38-47)

Theme 4 concerns reliance on the digital technologies that enable flexible work arrangements. Some participants stated that without enabling technologies, they would not be able to work at all and their evidence below provides support for this. In particular, technologies which facilitate communications are of primary significance for workers in distributed workplaces.

**Quotation (Record 38-42)**

| | |
|---|---|
| If it wasn't for technology, I think my life would be very, very different. The computer for me, now, is the hub of my life... it's the nucleus. That's the only way I can describe it. (P6) | 38 |
| When I can't get on the computer, I am unable to work at all. (P9) | 39 |
| I do a lot of report-writing, lots of planning of meetings and I've got to be able to interact seamlessly. And technology… it *has* to be my friend. It *has* to work at *my* speed, not me adjusting to it. (P6) | 40 |

Technologies appeared to be inter-related in a referential whole or totality of other technologies (as in software and hardware, for example).

| | |
|---|---|
| You know, on Thursday I'm going to Cardiff for the day, so I need my laptop to work and I need my car to work and I need my wheelchair to work, 'cause otherwise I can't go to Cardiff! (P7) | 41 |
| When the computer didn't fizz, I called in Access to Work. We needed to upgrade the adaptive software. So we all agreed. But next thing, the laptop died! Then we had to rethink it all and it ended up that we had to buy a new laptop with up-to-date software so that the adaptive software upgrade would then work. That lesson cost 10 days of downtime. (P2) | 42 |

Some participants spoke of their total reliance on fully-functional technologies that enabled flexible work arrangements.

**Quotations 43-45**

| | |
|---|---|
| Without technology, I couldn't work. Because I can't be in a 9-5 office environment. (P2) | 43 |
| Without technology, I couldn't work. I can't imagine what I'd be able to do. I can't sit. I'd have to be transported if I didn't work from home, somewhere. When I got transported, there I'd have to lie down. You know, my possibilities are pretty restricted, really. (P5) | 44 |
| I value my Internet more than, you know, water! I can live without running water for a while, but I can't live without my Internet! It's a lifeline. (P5) | 45 |

These fully-functional technologies are not only essential for flexible work, but are sometimes customised to suit individual needs, in accordance with their mobility impairment.

**Quotations (Records 46-47)**

| | |
|---|---|
| In terms of my technology, as such, for other people, they say they can't manage when their technology goes down. You've got to bear in mind that without that technology, I don't have *any* way of accessing information, at *all.* As soon as there is any corruption [with software] or I hit something that is no longer accessible, that's it! Game over! There is no way around it. (P2) | 46 |
| You might notice something on my forehead. That silver dot? Now, Ruth, what looks like a webcam on top of my monitor, now, that device is firing infra-red at me and what it does, depending on how the light reflects off that silver dot, it scopes out the angle of the light reflecting back to control the mouse. So you can see, the mouse moves up. So it's tracking my movement. So what I'm gonna do for this demo is. I'm going to get [the carer in the room] to take this dot off. *[Carer removes the dot.]* Now see - I can't do *anything* with that computer! (P6) | 47 |

In many instances, by the time I observed them working, participants had effected adaptations and 'fixes' to make things work. In almost all cases, participants were self-directed to solve problems, in terms of space, place, technology or practice and this led to the next theme.

## 4.6 THEME 5: LEARNING IN PRACTICE (Records 48-61)

Theme 5 is concerned with finding the information needed to make the work environment and its objects usable. In workplaces, learning this information is non-formal, often unstructured and frequently reactive to problem-solving, rather than structured, course-based or formally assessed learning.

**Quotation (Record 48)**

| | |
|---|---|
| From experience, I can find ways around my impairments. You learn as you go along. (P2) | 48 |

Some learning is structured, but informal. All three of the professional participants reported that they had to comply with the continuing professional development (CPD) requirements of their professional bodies.

**Quotation (Record 49)**

| A lot of my learning nowadays comes from if people bring a case back, because I will report breast stuff and gynae stuff, but then if it's cancer stuff, it goes to a second pathologist, who looks at it and they may come back and say: 'I think you've got the grade wrong' or 'I think you've not noticed this, that or the other'. So if there is a learning point from that and maybe I need to read an article, or whatever, then I'll do it that way – and I think that is quite effective, if it's like cases that change your practice. So that's good. (P1) | 49 |
|---|---|

Most of the learning came about through needing solutions for problems relating to the spatiality of the workplace and the things in it.

**Quotation (Record 50)**

| I needed certain adaptations and had to find out what was available. This way, I organised the height-adjustable cut-up bench in the lab and an automated stage was attached to my microscope to help the shoulder pain, height-adjustable desks and specialist office chairs, the electric wheelchair, a leather recliner chair. I also had to present a case to get a ramp, a designated disabled parking space, and to get several doors electrified and others kept open on catches. I had to investigate what I could get through Access to Work, which was a 'drive from wheelchair' car and support workers for 10 hours a week. And I needed to know my legal rights, too. (P1) | 50 |
|---|---|

In this case, the participant reported that she had had to know her legal rights, in order to effect some of the changes to make the environment accessible.

**Quotation (Record 51)**

| My boss' attitude was, well, I should just ask people to open the doors and I was having shoulder problems with opening these heavy doors. I had to look up and quote the legislation in order to get it sorted. (P1) | 51 |
|---|---|

Much of the learning came from when things go wrong, when things do not work and when adaptations to practice or to technology have to be made.

**Quotations (Records 52-55)**

| | |
|---|---|
| What I found with technology, I needed things, I wanted things. I had ideas that weren't around yet. Who do I go to? Who do I speak to? It was sometimes very difficult to find this information when the solutions weren't there.<br><br>What could work? It's a very, very difficult place to be. To know what is available, to know what the solution might be... I do things, experience things, find out about things. I've got an open mind about finding solutions. (P6) | 52 |
| With technology, I've now expanded what I've learned in practice... and moved to home automation. It's about tapping into what's out there. I have set up a program for the lights and central heating from the computer. It's not a disability product – but it's about tapping into what's out there by knowing what's available. (P6) | 53 |
| You need to know where to get the information you need. You need to know about software upgrades and what will work with your adaptive software or not. Software upgrades can be massive barriers! (P10) | 54 |
| We call it 'Swiss cheese'. Normally it's several areas that have happened that have all linked up to cause the problem. You walk through the lab and we'll examine the process and normally it's a failure in the process. It could be done this way, or it might be done that way, or it might be done another way. We learn ... we're very open as a department and you learn, like the airline industry, from your mistakes and try and sort it out and we also try to do root cause so that we find the actual cause, not what appears to be the cause. (P1) | 55 |

Finding solutions was frequently in response to communicating with others in communities of practice.

**Quotations (Records 56-61)**

| | |
|---|---|
| I went through a stage where I was not able to use a mobile phone any more .... Then there was a situation where something had happened to my assistant and I needed to make a phone call. And my means of communication was my assistant, who wasn't able to do it. So what that did for me was make me look into it … gotta be something out there! And I researched and I went to America in the end. I did the wrong thing there and got ripped off. I bought what amounted to a Bluetooth headset on steroids. Didn't work. They would not refund the money. What an expensive lesson! So I was forced to invent my own solution. (P6) | 56 |

| | |
|---|---|
| When Skype crashed last week, we couldn't work. So I couldn't connect to the office. What a hassle! The staff couldn't connect to clients as well when this happened. But you can't run a business like that. So I had to go into the office and call in the IT guy for a meeting to see what we could do to get going again. It was an opportunity to revisit our back-up procedures and what we do when the system goes down, to solve the problem and run the business. Maybe there is an alternative to Skype, is what I was quizzing our IT guy about. That's critical for remote working. (P11) | 57 |
| Well, BlackBerries – I think that they're the worst things ever invented for disabled people! The buttons are just too fiddly. You know, with not being very dextrous, trying to press in the tiny little buttons. I asked my boss: 'Do you have anything but BlackBerry?' And she said: 'No, the only thing we do is BlackBerries.' Well, I could not use it at all. I did some work to find out what was better that I can use and then got an iPhone – but it's mine, not theirs and I use it at work because I can't use that horrible BlackBerry! (P8) | 58 |
| I tried to use Dragon, aching as my hands are, 'cause my cerebral palsy affects my hands as well. I had to try it. But I would still find myself aching a lot and struggling 'cause being a journalist, spelling and grammar must be right and despite trying to make it work, it was just better for me to do it manually, difficult as it is. So that didn't work. I looked for better solutions, talking to other people and through reading, but in the end, I just do it manually. (P3) | 59 |
| I needed to solve the problem of getting to work on my own and pushing myself outside, so I investigated the possibilities because I had to find a better solution. So I did my homework and eventually got the van through Access to Work. I can transfer to the driver's seat, transfer back into my wheelchair and go in my electric wheelchair. So then I'd solved the problem and I could come and go on my own. (P4) | 60 |
| I needed to get to the office and to clients around the country and researched what kind of van to buy, with the help of Access to Work. I made a lot of calls, Googled and spoke to people. I needed a van with a ramp and also special hand controls – totally bespoke. Everything has to be remote-controlled, essential. The opposite of 'off-the-shelf'. To get the correct advice, I ended up at a specialist in Devon. (P11) | 61 |

Thus, with the information learned in practice – through trial and error, from experience and in metacognitive processes - people learn in non-formal ways. How they effect change depends on knowledge generated from the information they find, to guide further decisions to make space, place and objects usable. This leads to the final theme below.

## 4.7 THEME 6: DOING THINGS DIFFERENTLY (Records 62-73)

Theme 6, the final theme emanating from the phenomena, concerns what kind of actions people take, guided by the information learned, to make things work in practice. This takes the form of inventing and creating ways of obviating potential and real barriers in the workplace vis-à-vis space, place and the objects in it.

**Quotation (Record 62)**

| | |
|---|---|
| I tried and tried and tried again, until it eventually worked the way I needed. (P2) | 62 |

Not everybody needs to do things differently.

**Quotation (Record 63)**

| | |
|---|---|
| I'm using technology in the same way that an able-bodied person would – it's just that it actually makes more of a difference to me than it would for an able-bodied person because, you know, of the way I can manage my job and my time. (P7) | 63 |

Doing different things sometimes meant changing practice, sometimes technology.

**Quotations (Records 64-71)**

| | |
|---|---|
| I've had to invent all sorts of systems because that is really what I do. I put things together and make stuff. I create things from nothing sometimes. Just by… an idea. But I was close to tears sometimes. When you're working for hours and hours and hours trying to modify something to work for you and you get to having worked 11 hours and it doesn't work! Not another day! (P6) | 64 |
| I just have to do things differently. What I have to do when I meet with people and I have to get up and stand and talk to people, well, with the back-brace and neck-collar, I can stand for an hour. Then I take with me a chair that I can lie on, a reclining chair that I can lie on in between having to get up and stand and talk. It's a different way of living, but it's do-able! (P5) | 65 |
| What I had to do [to type dictated letters] was use a foot-pedal, but I can't push on a foot-pedal with my foot. So what I had to do was make a plan. I lift the foot-pedal onto the desk and use the foot-pedal with my hand and type using one hand. I made it work because it was part of my job role and I | 66 |

| | |
|---|---|
| had to. I alternately flip with my left hand from using the pedal, playing the recording, to coming right over and typing and then going back. That's the way I do transcription if I have to. (P8) | |
| I had to make a better plan. I got permission to work from home connected through my laptop. That way, I could still do my work and answer emails without going into the office. (P10) | 67 |
| My hands hurt, so I got voice recognition software some years ago. It helps with my disability because you're not having to do so much typing. This is so much more efficient because we can authorise immediately and get the reports to the doctors on the wards. As a result, my non-disabled colleagues now also use voice-recognition as well. (P1) | 68 |
| Sometimes changing things is *not* better! I don't have any individual finger movement, so I got an early version of voice recognition to help me type. But mostly I still used a secretary. However, when the firm saw that there were efficiencies to be had in cutting down secretarial staff and making the solicitors do their own letters, it was rolled out to the whole firm. But for me, it was more difficult to get the letters sent out, not easier! Why? Because you then had to do the letter yourself, send it to the printer, collect it from the printer, get an envelope, sign it and get it to the post room. This was not helpful to me at all because I needed *more* mobility, not *less!* (P4) | 69 |
| I don't sleep much. I do a lot of work in the middle of the night when everything's quiet. I have unexpected stays in hospital and I have to carry on from a hospital bed. Pay the wages from a hospital bed. Keep things going. No-one else can but me! And they [the staff] totally depend on me. It *has* to work this way. (P2) | 70 |
| Because I can't stand up, it's much more inconvenient for me to go to a file, use one arm, try and open the file, balance it on my hand, because I can't even hold it in my left hand, access the paper, find it. I can't reach files, I can't get to them. I try to be independent. So I've had to change my practices. Save everything in folders on the computer – everything. Doing this has *made* me organised because I have *everything* to hand. I've adapted my disability to turn it into an advantage to me. (P11) | 71 |

In some cases, imaginative ways of using, customising and appropriating technologies came out of this experimentation, doing things in different ways, in order to be able to work at all.

### 4.7.1 Two examples of doing things differently

Two final examples of imaginative use of technologies follow.

Participant 6 is not able to use his hands to use a keyboard or make or receive telephone calls.

In **Record 72** below, the photograph shows how he makes a telephone call using voice recognition software, a head-mouse, dwell-clicking software and a mainstream headset which he had modified so that it was magnetically activated by a movement of his head, switching the headset on and off to make and answer calls.

The telephone keypad can be seen on the computer screen. Using dwell-clicking software with the head-mouse (and head movements to position the clicking in the right place), the participant dials the number using movements of his head to position the head-mouse.

To activate the headset, he taps his head onto the back of the wheelchair's seat and a magnet switches it on or off.

A second and final example, also with a photograph, shows how the participant who is blind as well as being a wheelchair user, uses her technologies in an imaginative way.

In **Record 73** below, the participant is advising a client, using mainstream software, voice recognition software, Voice-over-Internet Protocol (Skype) software and JAWS screen-reading software. The client cannot read, as she has a learning difficulty and needs guidance on the postal vote which she has been sent. Using mainstream and adaptive software, the participant is able to communicate remotely with staff and clients and run her business using the technologies, as shown below.

**Quotation (Record 72)**

You can see what looks like a standard mobile phone here on the chair. I can interact with that without even touching it. *[The participant uses the head-mouse to activate a copy of a mobile phone keypad on the computer screen since he does not have use of his hands.]* You can see … nobody's touching a thing – I'm doing all my dialling on the screen. *[At this moment, the mobile phone on the chair starts ringing.]* So, how do I answer this call? What I've done is a bit crude, but it's my invention. Any kind of headset you can buy off the market, you *have* to be able to press a button to activate it. So what I've done is taken the standard headset and modified it and I've put my own switch into it, which is what's called a 'red switch'. Which operates, being a magnet. So instead of pressing a button, all I have to do is tap my headrest with my head. Job done! And so that took me a year to develop that… it was just about finding a solution. It's actually very crude. For me, it *has* to work. It *has* to do what I want it to do *exactly* when I want it to do. Otherwise I get fed up with it and throw it away and run it over! (P6)/*See figure 4.3*
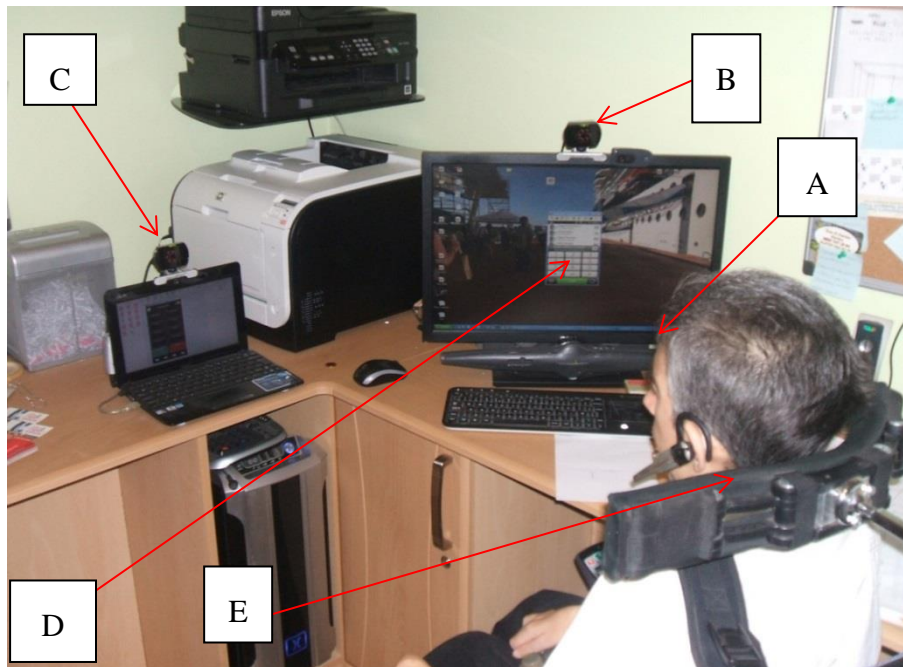


**Figure 4.3:** Participant 6 and how he works, hands-free. Copyright (2016) (Copyright holder withheld for ethical reasons.) Reprinted with permission.

*Legend:*

*A: Silver 'target' dot on forehead that connects with (**B**) or **(C)**, the infra-red wireless optical sensors of the headmouse and controlled by head movements*

*D: Telephone screen for dialling calls from a mobile telephone activated by voice recognition software and using the headmouse to click on the dialling pad on the screen*

*E: Magnetic on/off switch to activate headphone to make and receive telephone calls (taps head onto back of headrest to activate switch)*

A second and final example, also with a photograph, shows how the participant who is blind as well as being a wheelchair user, uses her technologies in an imaginative way.

In **Record 73** below, the participant is advising a client, using mainstream software, voice recognition software, Voice-over-Internet Protocol (Skype) software and JAWS screen-reading software. The client cannot read, as she has a learning difficulty and needs guidance on the postal vote which she has been sent. Using mainstream and adaptive software, the participant is able to communicate remotely with staff and clients and run her business using the technologies, as shown below.

**Quotation (Record 73)**

We use virtual network connections so that I can see upstairs to support the staff up there. So effectively, I can trouble-shoot the PCs on the top floor – the third floor – without physically going up there if one of them gets stuck with something or doesn't know what to do. So we Skype each other. And they'll show me a document, rather than coming all the way down. 'Cause I certainly can't get up there. My husband has to carry me up to bed and bring me downstairs every day, as it is. The staff work on the third floor. So, which file do I want up there? They'll show me through the webcam and I'll say: 'Stop!' Same with clients. They hold up documents to their Skype camera and then I can advise them from here and they can be anywhere in the country. I *have* to do it. I don't have a *choice.* It *has* to happen. (P2)/*See figure 4.4*
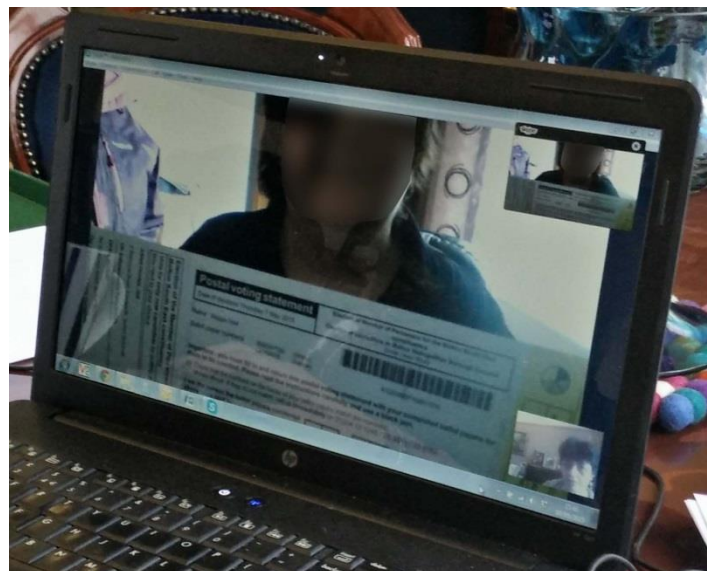


**Figure 4.4:** Two people who cannot read the document on the screen, communicating remotely to discuss it Copyright (2016) (Copyright holder withheld for ethical reasons.) Reprinted with permission.

## 4.8 SUMMARY AND NEXT CHAPTER

Chapter 4 has presented the evidence as six themes which are constitutive of the phenomena in terms of *where* and *how* work can take place for the participants. The data described how these participants use digital technologies in their workplaces. Those observations and discussions led to the text of this chapter, and constituted the response to the first research question: how participants are using technologies at work. In answering this descriptive question, the basis was laid for later interpretations in terms of usability of space, place and things.

Quotations from participants have been used to illustrate the themes. The themes are interlinked in order to provide the logic for the discussion of them in Chapter 5 below.

Chapter 5 discusses the same themes, in the same order. Initial interpretations from the descriptions of the themes above indicated the primacy of spatiality and the things in that space, for workers with mobility impairments, whether walking with crutches, using wheelchairs, or using a white cane. I link the six themes to prior research and use the lenses of disability theory, affordance theory and a Heideggerian interpretation of usability in order to arrive at an understanding of access (or barriers) to people with mobility impairments in the course of their work.

# CHAPTER 5 -DISCUSSION

## 5.1 OVERVIEW OF THIS CHAPTER

### 5.1.1 Answering the research questions

This chapter addresses the remaining two research questions, through a nuanced and threaded discussion of the themes identified in the previous chapter. The successive arguments of each theme are designed to answer the analytical research questions incrementally – in what ways affordances of technology can be revealed as phenomena and in what ways these phenomena can be interpreted.

At the end of the early phases of data analysis I began to see that the phenomena that constitute the themes of the later phases of analysis could broadly be described as the 'where' and the 'how' of work, that is, where work takes places and how this work is enacted. Very early analysis during the data collection phase indicated that the phenomena would be interpreted in terms of the usability of space, place and things, leading to my search for prior research on affordances and a phenomenological understanding of spatiality and equipment in that space, for people with mobility impairments.

I present below these six themes and in the same order as the previous chapter for easy reference. Each theme begins with my argument for that theme and an exemplary, illustrative 'typical' record. Each theme links logically to the one that follows it and builds on the previous argument, incrementally.

By the end of Theme 6, I have made a case that is built incrementally out of the six themes. That moves the analysis into a level of interpretation in terms of access, barriers and participation by synthesising the themes into a holistic interpretation, relating the parts to the referential whole of the hermeneutic circle (as in Introna (2008)).

By analysing the themes this way, the thread of logic will show, as I proceed through the six themes, that *being* a knowledge-worker with a mobility impairment is (for the most part) contingent on the usability of space and the things in it. When the workplace and its socio-materiality present with negative affordances, people are sometimes able to make adaptations, drawing on what they learn in their communities of practice, to make space, place and objects usable. Unless and until this happens, some people may not be able to work at all as the evidence shows in Chapter 4 above.

Record numbers in the sections below (shown in bold) relate to the records in Chapter 4 above.

## 5.2 THEME 1: *BEING* A WORKER WITH A MOBILITY IMPAIRMENT (Records 1-14)

The argument of Theme 1 is that whether workers with mobility impairments identify with a disabled identity or not in their communities of practice, 'fitting in' and 'proving' themselves as competent members of those communities of practice is sometimes related to their mobility impairment.

The theme is exemplified in **Records 6 and 8** and repeated here:

> When I was on my crutches, I almost pretended I wasn't disabled and you just got on with it. You kind of almost don't want to admit you're disabled and you just want to fit with everybody else. (P1)

> I feel as though I have to *prove t*o the world I'm *just* as good as someone who isn't disabled. And I shouldn't *have* to do that! I should be taken on merit like everybody else is taken on merit. But there is that kind of over-achievement – that you feel you have to prove to others and yourself that you are as good as other people. It's wrong, but it's there. (P5)

Not every worker with an impairment identifies as being disabled at all (Ridolfo & Ward, 2013; Shakespeare, 2006; Watson, 2012). In my study, most participants identified primarily with their communities of practice and professional areas of work (telling me, for example, 'I'm a personal injuries solicitor' (P4) and not 'I'm a *disabled* personal injuries solicitor').

However, M.J. Oliver and Barnes (1998, p. 66) claim that perceptions of oneself come about through how we imagine others seeing us in a process of devaluing the person with the impairment:

> To become 'disabled' is to be assigned a new identity indicating membership of a separate tribe or species. To be born with an impairment is to have this identity assigned …

The only participant who found his impairment to be aligned to his identity was Participant 6 when he told me that his impairment was part of who he *is* in 'my impairment is very much part of who I am' **(Record 1).** But contrary to the view of M.J. Oliver and Barnes (1998) above, his understanding of his identity was grounded in his *own* reality, not in labels other people had assigned (and certainly not in the 'separate tribe or species' to which M.J. Oliver and Barnes allude). This was expanded when he said that he no longer felt a need to prove his competence at work *because* of his physical impairments - rather, he prided himself on being a competent town planner, meeting his targets. Some participants viewed their impairment with reference to time, as before or after their illness **(Records 2-4).** This is illustrated in **Record 3,** for example, in remarks of the type: '*before* I was disabled…'.

What an initial Heideggerian interpretation makes of these data is the following: our ontological identities are grounded in the data of everyday interactions with others, embedded in equipped, engaged practice, over time (Heidegger, 1962; Mulhall, 2005; T. Wilson, 2015). In this view, our identity is inseparable from what we *do* (Couzens Hoy, 1993). '*I'm a personal injuries solicitor*' (P4), for example, tells what the participant broadly does and to

which kind of community of practice he belongs and with whom he might engage. It indicates not only what he does, but what resources he might use and the discursive arena in which 'personal injuries law' operates. When I look into further information which the participant supplied (his biography on his employer's website), clearly he is fully engaged with the practices of his legal community of practice in the ways which Wenger (1998, 2000) describes: he is mutually engaged with others, using shared resources in a landscape of practices to achieve the goals of that community in an identity-making (and changing) process. As Wenger (1998) theorises, this is all in an environment of learning to *be* a competent member of a community of practice.

The temporal angle to being and learning in this community of practice is to be found in comments 'when I *was* a trainee solicitor' … '*now* as an experienced solicitor …' (P4). In this way, identities are related to what we *know*, in their capacities as 'meaning-making, identity-forming and order-producing activities'(Nicolini, 2011). In Heidegger's ontological scheme, what we *know* is a matter of who we *are* and what we *know* materialises in socio-material practice as 'bodily choreography'(Nicolini, 2012, p. 220). Expressed similarly, and recognising the corporeal nature of practices (more than Heidegger and certainly more than Barnes and M.J. Oliver (1998) above), the way Schatzki (2007, p. 471) sees practices is as 'organised human activities' in which the individual agent engages in these bodily routinised practices in 'chains of action' (p.472) (also Reckwitz, 2002).

Nevertheless, identities and who we *are* at work are multiple and arise through learning in practice to *become* the solicitor, the histopathologist or the journalist (for example, Brown & Duguid, 2001; Gherardi, 2006; Wenger-Trayner et al., 2015; Wenger, 1998). As Wenger (1998) points out, we are members of multiple communities of practice simultaneously, and thereby have different identities that frequently overlap. This is a plausible way of understanding how most participants identified more with their professional identities than

with their disabled identities (other than Participant 6, the town planner, who identified very strongly with his disabled self).

### 5.2.1 Identities and 'affiliative objects'

For some of my participants, identifying as disabled related directly to having to use a wheelchair **(Records 5-7).** On the one hand, wheelchairs afford mobility and independence, but on the other, they are a symbol of limitation (Korotchenko & Hurd Clarke, 2013; Papadimitriou, 2008; Woods & Watson, 2003). Winance, Marcellin, and de Léséleuc (2015) note, in their study of wheelchairs and mobility, that while a wheelchair affords mobility, positive affordances are negated unless the wheelchair-user self-propels. It was not addressed in the discussions, and only came to light in the course of this analysis, that there might be some symbolic meaning to 'wheel-chair' as an 'affiliative object' (as in Suchman, 2005). Michalko (1999) reports, for example, that he did not want to use a white cane because it made him *feel* blind, although his blindness was a matter of mobility (as well as a state of *being*), for him, because feeling blind represented a needy and dependent person in search of rehabilitation, a cure, or aid. Perhaps this is the meaning of Sheldon (2004) in saying that neither technologies nor adaptive devices are neutral. One participant reported feeling less impaired prior to using a wheelchair **(Records 5-6).** This confirms what D. Wilson (2009, p. 191) writes in his historical account of polio:

> For polio survivors, standing and walking, even with crutches and with difficulty, meant they were less disabled, more normal, than those reliant on wheelchairs.

Becoming a wheelchair user also meant fitting in with others in their communities of practice.

### 5.2.2 Fitting in and proving competence

Both participants in **Records 5-7** spoke about how, as wheelchair-users, they felt a need to 'fit in' with the non-disabled world of work around them, 'in terms of space and in terms of other people' (P1). I interpret this as being a spatial issue (resulting from their impairment) and, as Participant 7 told me, the 'footprint of my wheelchair' was much bigger than when he was able to stand. It was a case of 'fitting in' with the other people in shared space.

Fitting in with their worlds of work was also related to proving competence in it. In the widely discredited research of Miller and Gwynne (1972, p. 46), they claimed that disabled workers need 'to demonstrate that they are more competent, more diligent, more conscientious …'. **Records 8-10** confirm these sentiments (in spite of other criticisms of the Miller and Gwynne research in Chapter 3.7.2 above) and reflect the participants' need to 'prove' their competence *because* of their disability.

This raises the troubling thought that while the social model rejects bodily concerns, viewing them as individualistic, people cannot be called 'disabled' *unless* they have an impairment (as in Tremain, 2005). Even if the social model disavows bodily difference and impairment, practically, these participants experienced difference (which was not necessarily discriminatory).

**Records 11-14** continue the issue of 'proving' oneself *because* of impairments. They raise the puzzling issue of *being* a wheelchair-user, *being* disabled and *being* a worker vis-à-vis the issue of competence. It was not clear to the participants (nor myself) why *being* disabled (and *particularly* being a wheelchair-user) was perceived, in workplaces, to be a matter of competence. I did not resolve this puzzle and realised that it is not only outside the scope of my research, but is probably a very difficult puzzle to research at all – and worryingly, it is

possible to speculate that this may be at the very root of the problem of discriminatory practices in work places for people with mobility impairments.

Being a competent professional at work was more a case of identifying with non-disabled colleagues (also Watson, 2002) – and fitting in – than identifying primarily as disabled. This was particularly demonstrated in observations which revealed shared understandings and shared resources with work colleagues (also Cook & Yanow, 1993; Fenwick, 2007; Wenger, 1998, 2000). Shared understandings are fundamental ways of *being* in Heidegger's (1962) work as well. Participants mostly spoke of their work practices in terms of their professional selves, as competent members of their communities of practice, participating in the practices of *being* an employee or *being* self-employed – and also of 'fitting in' in order to participate.

While the social model of disability distances itself from individuals, their impairments and their identities, my analysis *has* to include these components, for these are the issues which were brought into being through exposing the phenomena and in the voices of the participants, as their impairments have a bearing on their identities and the phenomena. By ignoring corporeality this is, as Paterson and Hughes (1999, p. 599) point out, 'another manifestation of exclusion' (and a reason to research disability phenomenologically). Also, as Crow (1996) and Marks (1999) argue, it is difficult to give people a voice when there is no body for that voice.

### 5.2.3 The argument thus far

The argument thus far is that irrespective of acknowledging a disabled identity or not, the issue is frequently one of these workers reporting a need to 'fit in' which sometimes includes 'proving' themselves as competent members of their communities of practice *because* of their mobility impairment.

'Fitting-in' has a spatial component in the world of work and in this study; flexible work arrangements and the spatiality of work play an essential role in *where* work practices are enacted.

## 5.3 THEME 2: FLEXIBLE WORK ARRANGEMENTS – SPATIALITY AND WORK (Records 15-30)

The argument of Theme 2 is that flexible work arrangements have spatial qualities which are of importance to people with mobility impairments when they cannot work in standard work configurations.

Distributed workplaces (in this case, people's homes) split spatiality between remote locations, while different modes of employment (in this case, self-employment and employment) take place in these distributed locations. In this study, self-employment was based at home for three people (P2, P5, P11) and in a standard office for one (P3). Employment amounted to work at home for two people (P6, P7) but in standard offices for the rest (P1, P4, P8, P9, P10). Furthermore, the placement of people's 'stuff' in these diverse spaces showed up as being of primary importance to participants.

The theme is exemplified in **Record 30**, repeated here:

> It's so much easier to be manoeuvrable as an able-bodied person .… For example, my printer at home is beside my desk, whereas here in our head office, it's on the other side of the building and so I have to go and fetch everything. Which just takes that little bit longer than if I could walk or had the printer next to me. As I write this, I have my laptop, printer, two mobile phones and a landline, two memory sticks and a pile of paperwork within arm's reach. (P7)

Space and place are where things belong (Heidegger, 1962; Schatzki, 2007). As Schatzki (2007, 2015) explains Heidegger's theory on the significance of place: place functions to locate equipment and people in contextual social practice, which, he argues, is inherently spatial. **Record 16** describes this space of a home-office as being 'a whole little world'.

Similarly, another participant, also working from a home office, described the (outside) world as being 'that very difficult world out there' **(Record 18)**.

**Records 18- 20** embody the claim made by all three of these participants (P2, P5, P6) that their home office is the *only* place that 'facilitates [their] abilities' (P2) because without a personal assistant and medical equipment at home (P6), and without being able to lie on a bed and work (P5*), none* of these three people would be working at all (as they told me). With flexible work arrangements that facilitate work, mediated by technology, as well as their mode of employment (self-employed for two of the three), these participants typify Shah's (2005) description of 'high-flyers' or the term I prefer, Zola's (1982) 'successful mainstream adapters'.

Seamon (1980b, p. 159) views geographical space in terms of a 'place-ballet' of spatio-temporal practices, in the context of space being grounded in bodily activities. Where the social model of disability particularly and Heideggerian phenomenology to a lesser extent might disregard bodily spatiality (as discussed in Chapter 2.4.2 above), the participants *themselves* recognise that their own corporeal mobility limitations impact the worlds in which they work. These self-declarations *cannot* be ignored, for, as Seamon (1980a, p. 194) posits, 'people are as much *geographical* beings as they are social, cultural or economic'. In this 'place-ballet' (Seamon, 1980b, p. 159), work for some people is contingent and conditional. Without flexible work arrangements in one configuration or another, some people might not be in work at all, again, as expressed by some of these participants themselves. Difficulties of working as a disabled worker in terms of space are exemplified in **Record 17,** where the participant was made to 'hot-desk' in the office of his then employer. Physical discomfort, proximity of objects in this space, lack of access to a desk and, finally, lack of access to new premises without a lift added to the biggest barrier in this situation: attitudes, ultimately the reason for the participant leaving that position.

Where some of the literature highlights the negative aspects of distributed work (not only for disabled workers), for many others, the positive affordances of flexible work arrangements mean participation in and through distributed workplaces (ACAS, 2015; Bailey & Kurland, 2002; Burnett et al., 2010; CBI/Harvey Nash, 2011; Fogarty et al., 2011; Lloyds Banking Group, 2012; Ruiz & Walling, 2005; Taskin & Bridoux, 2010; Taskin & Edwards, 2007; The Future of Work Institute, 2012).

In a metaphorical sense, flexible work arrangements expand lived space by connecting distributed physical space, thereby affording work practices – and, therefore, participation – in these distributed workplaces.

### 5.3.1 Modes of employment as spatial

In addition to working from home, the *only* mode of employment for some people, is self-employment as a disabled 'entrepreneur' (Wood, Davidson, & Fielden, 2012)[29]. In a Swedish study of 'start-up' entrepreneurs, of whom about 1,000 declared a 'work handicap', the findings revealed that entrepreneurs who had impairments had the same chance of economic success as non-disabled entrepreneurs (Larsson, 2006). However, Wood et al. (2012) claim that added difficulties and attitudinal barriers apply to disabled entrepreneurs, particularly when raising finance. Not everyone sees the opportunities for working as self-employed as positively as the self-employed participants in my study. Some researchers regard self-employment as a second-best arrangement for workers who cannot find employment in mainstream labour markets (Boylan & Burchardt, 2003; Cooney, 2008; Drakopolou-Dodd, 2015; Pagán, 2009), but my self-employed participants did not view self-employment negatively in terms of either low incomes or lost social benefits. Rather, these three participants viewed their choices as self-directed to have, as Stephen Hawking has said, 'a

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[29] Despite my reservations about the meaning of the term 'entrepreneur' (as discussed in Chapter 2 above), I am using this to mean 'self-employed'.

chance to shine' (WHO/World Bank, 2011) and to achieve personal goals (also in Shakespeare (2015)). Research investigating the economics of self-employment for disabled entrepreneurs found that self-employment could 'provide an important means by which people with work- limiting disabilities can accommodate their impairment' (Jones & Latreille, 2011, p. 4161). While these studies suggest that self-employment has more positive effects for disabled workers, for some participants in my sample, it is the *only* way to work and, as Participant 5 told me, it would not be viable to work in a standard office, either for herself, or for an employer.

**Record 20** typifies the argument that flexible work arrangements have a spatial quality. The record includes a photograph of the participant, lying on her bed, with her computer suspended above her. She runs her recruitment business this way, having to lie flat on her back 23 hours out of 24. She employs seven workers. Her seven employees, mostly sales staff, work remotely from their homes, all networked digitally, all themselves disabled and all working negotiated, flexible hours. For these seven employees, working from their own homes is also the *only* way for them to work, connected to their head office, her bedroom, via digital technologies.

One surprising discovery in this research arose in discussing modes of employment. That is, that three of the participants are *themselves* employers of another 27 workers (excluding care assistants). I had not expected to find this and could not locate research on disabled people as employers (other than of care assistants). These 27 workers are paid employees of Participants 2, 5 and 11.

Thirteen of the 27 paid workers working for these three participants have different disabilities themselves. This work accommodates their impairments – one deaf employee answers emails for Participant 2 and she does this remotely. A worker with autism works remotely for

Participant 5 on spreadsheets. Another four are employed as sales people on the telephone, all operating from their own homes remotely for Participant 5 in her recruitment business, dealing with her clients, major UK companies. The remainder all do clerical work of one type or another. All of the remote workers are connected via digital technologies, to the offices of Participants 2 and 5. Participant 11 employs 14 people as administrative staff and all are based in a standard office, while he works from his home office. (None of his workers have disabilities and none work remotely from their homes, although line managers are connected by Voice-over-Internet Protocol (Skype) software to him during the working day.)

My observation is that, for the three participants who employ these 27 workers, there are spiralling effects not only for the three participants and their businesses, but for an additional 27 people and their families, through employment opportunities, and particularly for the people with disabilities working from their homes for Participants 2 and 5. The effects to which I refer are participation and inclusion in wider social and economic processes brought about directly through their employment.

### 5.3.2 Proximity of a 'totality' of things

**Records 21-24** give some sense of 'what it's like' to be a worker with a mobility impairment, requiring the proximity of amenities and objects (for example, also Toombs (1992)). These records also give some sense of the unvoiced, implicit understandings from phenomenological discussions (for example, as noted by Kvale and Brinkmann (2009) and Finlay (2011)). While I am acutely aware of the ethical issues and responsibilities facing the non-disabled researcher, I agree with Toombs (1992) that some phenomenological experiences (of disability, here) are simply unshareable and I do not pretend to have 'understood' what it is 'like' to be a person with a mobility impairment. However, I need to convey a sense of 'what it's like' and do so by using the participants' own words to which I

now add my own interpretation, however contingent, contestable, partial and subject to change it may be.

Mulhall (2005) explains Heidegger's position on spatial relations in terms of what is near and far, close and distant. Spatiality shows up as both proximity (near/far) and place (where) in Heidegger's analysis and refers to 'a totality of particular equipment in their possible places as defined by the possible actions that they can subserve for certain possible ends' (Schatzki, 2010, p. 52).

In **Records 25-31,** I present examples which demonstrate that objects in practice need to be accessible to be usable, where and when they are required. Heidegger (1962) terms this 'ready-to-hand', normally not noticed nor reflected upon – unless they are unavailable or inaccessible (for example, too high or too heavy).

In **Record 25** I have included a photograph of the participant, in her wheelchair, in the laboratory at work. Unless this participant is able to use the space in the laboratory, reach and use the objects in it, clearly, she would not be able to do her work. What is shown and what is nearby (making it all usable), is the height-adjustable 'cut-up bench' and the elbow-operated dictaphone on the arm of her wheelchair. As she says: 'I *have* to have these things where I need them.' Similarly, **Records 26-30** also show that participants talk about their 'stuff' having to be in certain places, reachable, ready-to-hand and usable in spatial 'practice-arrangement bundles' (Schatzki, 2015). In these records, four different participants use the word 'need' in terms of the proximity of their 'stuff' – which I interpret as indicating that this is an essential condition of work. Heidegger (1962) repeatedly emphasises that we understand spatial relations with objects in relation to their practical purposes (Mulhall, 2005; T. Wilson, 2015). What is near and far, and where things are, are matters of 'handiness' or 'unhandiness'. Spatial relations are determined by their use potential and serviceability for

our activities in practice, which is also Gibson's (1986) view. For my participants, there is an added aspect to Dreyfus's (1991, p. 129) contention that '…equipment has its place', that is, that things are needed to be where they are reachable, accessible and usable.

From a Heideggerian perspective, these participants are engaging with a totality of equipment, in the practice of 'doing' pathology, journalism, counselling, etc. in a pre-understood environment (the laboratory, the standard office and the home office, respectively) and engaging and participating in the social practice of work – or, in Heidegger's (1962) terminology, *being-in-the-world*. Such a 'world', according to Heidegger, is 'a nexus of meaningful entities involved in or connected to that person's activities' (Schatzki, 2010, p. 51). In some ways, I see the spatiality of the work environments as the 'private' built environment where things are accessible or not, usable or not. What is also important for these workers is the 'public' built environment, where workers use public space and the institutional artefacts in that space, to get to work and be in work.

### 5.3.3 The argument thus far

The argument thus far is that flexible work arrangements in the form of distributed work and different modes of employment have spatial qualities which are of heightened significance for people with mobility impairments. In order to fit in and participate in their communities of practice, flexible working arrangements are unconditional requirements for some people with mobility impairments. Whichever mode of employment or arrangement of flexible working is selected, these workers feel a need to fit in as competent members of their communities of practice sometimes because of their mobility impairment.

This leads to the third theme, the built environment for these participants.

## 5.4 THEME 3: THE BUILT ENVIRONMENT (Records 31-37)

The argument of Theme 3 is that public space, when inaccessible, can present barriers to participation in work life. Frequently, taken-for-granted exclusion can begin with barriers in the work environment.

The theme is exemplified in **Record 36** and repeated here:

> I rang up to see if they've got wi-fi in that meeting room. And I just dropped it in, I went: 'Oh, I'm disabled as well, so which lift do I have to use to get up?' She went: 'Ummm *[pause]...* you in a wheelchair?' I went: 'Yeah.' She went: 'I don't think there's any access. There's some steps to that meeting room.' (P8)

The reason that access to the built environment is so important is that:

> People require access to a genuine feeling of legitimate participation, meaningfulness and belonging. (Titchkosky, 2011, p. 7)

While the spatiality of the built environment has clear links to policy and legal structures (Hwang & Roulstone, 2015), it also intersects with urban geography, disability and 'environmental justice' (Imrie & Thomas, 2008, p. 477) where not always are the views of disabled people taken into account in policy frameworks (Imrie & Hall, 2001). In the socially constructed spaces of urban life, there is an exclusionary spatial logic in a 'disembodied urban design' (Imrie, 2012, p. 2266) as can be seen in **Records 31-33**, where the participants had difficulties with transport, getting to work, and generally getting around in urban areas. When people confront barriers in the built environment, whether on the way to work or at work, it is a matter of participation or not. **Records 34 and 35** illustrate difficulties of how near, far and accessible toilets are in workplaces for people with mobility difficulties.

### 5.4.1 How taken-for-granted assumptions contribute to exclusionary processes

It is useful at this point to consider Roulstone's (2002, p628) concern as to how disabled people are more or less excluded in the modern workplace (and in 'an otherwise exclusive

social world'). When barriers are seen as taken-for-granted in the form of 'the way things are' they can be seen as attitudinal barriers (even when they begin as physical barriers). Titchkosky (2011, p. xi) explains taken-for-grantedness like this in terms of '… the myriad ways that the everyday practices of exclusion and inclusion are not noticed and thus made to disappear'. She continues with this line of thought, observing that even when the barriers *are* noticed, they are still 'conceived as somehow natural, reasonable, sensible, and even seemingly justifiable' (p.xi). Roulstone's (2002) concern and Titchkosky's (2011) explanation, both above, fit very well with the next two examples in my data in this section, **Records 36 and 37.**

### 5.4.2 Two examples of taken-for-granted barriers that amount to exclusion

In the first example, no access for Participant 8 to a meeting room for lack of a ramp meant that a different secretary had to be called upon to take the minutes for that meeting. In the second very similar example, Participant 1 was told that the lift in the building in question which was too small to accommodate her wheelchair, could not be made bigger because of the 'grade II' listed status of the building. What is similar about the examples is that, firstly, both participants were excluded from their meetings. Secondly, the practice of having meetings in these inaccessible places was not changed to alternative premises despite these two workers not having access. Thirdly it was clear that these two people were expected to understand the reasons for the exclusion (and, it seemed to me, had done so), because of the taken-for-granted explanations that exclusion could be justified.

The exclusion from the practices did not trigger change to practice at all. In both cases, these meetings *continued* to be held in these inaccessible places and they were *not* one-off instances, reinforcing Titchkosky's (2011) explanation above as to the process of how taken-for-grantedness can become normalised as acceptable. A major part of this exclusionary

process is to reinforce the exclusion so that, in future, the disabled employee *knows* they have no access to the building/meeting room (and accepts the reasoning behind it). This further cements the fact that it is 'naturalised' by accepting that this 'is the way it is' in such a way, that no access is seen as being somehow acceptable. Titchkosky would explain the mechanics of this exclusion as a process in which, by verbalising this otherwise mundane remark, 'it's a grade II-listed building', such sayings are a 'conduit of types of cultural understandings' (p 74) that are 'treated by all involved as sensible' (p. 153). Both participants 1 and 8 in these two examples are included in Titchkosky's 'all' here, in my understanding of the situation, because in order to 'fit in' with their non-disabled colleagues, both reported that it was preferable *not* to have spoken up at the time (thereby probably reinforcing the taken-for-granted assumption that the exclusion was perfectly justifiable).

Space structures interactions between people (Freund, 2001) and in these examples, my interpretation of this situation is that while both participants admitted that this was hurtful and 'not fair' (P1), they tolerated the exclusion, ironically, to fit in (with their identities in professional practice). Engagement in practices is only possible when the spatiality of the workplace is accessible in the first instance. *Fitting in* is only possible when people can physically access the spatiality of the workplace. *Being* the pathologist and being the director of complaints manager, in these examples, is only possible if the spatiality of the workplace is accessible.

Palmer (1969, p. 134) explains Heidegger's (1962) view on spatiality as a world in which there are 'fabrics of relationships' in which people share a common environment and taken-for-granted understandings of it (similar to Wenger's (1998) concepts of engaging in mutual understandings in communities of practice). In the final analysis, the barriers in these examples had everything to do with the attitudes of others and lack of support from their

employers and line managers, rather than the exclusionary designed spatiality of the built environments.

### 5.4.3 The argument thus far

The argument thus far, is that people need to fit in with their communities of practice in order to *be* the competent solicitor, training manager, accountant, for example. Fitting in (and sometimes feeling a need to prove competence as a by-product of having a mobility impairment) presupposes physical access to the built environment, whatever mode of employment or in whichever type of distributed work practice is relevant. Therefore, the primacy of space, place and objects in that space have heightened significance for people with mobility impairments. Viewed from a Gibsonian (1986) perspective, affordances of space, place and objects need to be positive in order to be usable.

I now turn to the technologies which inhabit the 'lived space' (Schatzki, 2007, p. 35) of social practices.

### 5.5 THEME 4: RELIANCE ON TECHNOLOGY (Records 38-47)

The argument of Theme 4 is that without a 'totality' of interrelated technologies which enable flexible work arrangements, some people would not be able to work at all. Those participants working in home offices were particularly reliant on fully functioning communications technologies.

The theme is exemplified in **Records 38 and 43** repeated here:

> If it wasn't for technology, I think my life would be very, very different. The computer for me, now, is the hub of my life... it's the nucleus. That's the only way I can describe it. (P6)

> Without technology, I couldn't work. Because I can't be in a 9-5 office environment. (P2)

A Heideggerian explanation of the need for equipment that is ready-to-hand in 'its service*ability*, its us*ability* and its detriment*ality*' (Heidegger, 1962, p. 184) (italics in the original) would always be one grounded in equipped, embodied practice (T. Wilson, 2015). As ready-to-hand, it is usable, unreflected-upon and unnoticed. When it is unusable, broken or inaccessible, it is present-at-hand and consciously reflected-upon.

**Records 39-42** illustrate the complete reliance on technology by some participants.

### 5.5.1 The inter-relatedness of technologies

**Record 41** exemplifies the view, expressed by most of the participants, that their technologies *need* to be functional where and when they require this. When Participant 7 told me that his car, the laptop and the wheelchair all need to be functional, the meaning or 'sense-content' (Ricoeur, 1981) extends not only to getting to his meeting in Cardiff, but also to broader, participatory activities of his work practice. Furthermore, this 'totality of equipment' is

> constituted by various ways of the 'in-order-to', such as serviceability, conduciveness, usability, manipulability (Heidegger, 1962, p. 97).

**In Record 42,** Participant 2 gave an example of this referential whole of equipment when Access to Work funded an upgrade for software that 'killed' her laptop, which in turn interrupted her use of the Internet and Voice-over-Internet Protocol (Skype) software. This had spiralling further consequences for the next 10 days: her business almost ground to a halt.

From a Heideggerian perspective, getting to Cardiff, and using the materiality of the car, the laptop and the wheelchair would normally be unreflected-upon and incorporated into routinised and unnoticed everyday work practice. But when issues arise and the car, the laptop or the wheelchair are not functional for any reason, the lack of functionality is reflected upon consciously *because* of its present-at-hand status. The 'in-order-tos', so

indispensable in Heidegger's thinking (that we use equipment in-order-to do purposeful things) are obstructed and become barriers to participation.

Another way of looking at this is from an affordance perspective. Gibson (1986) theorises that affordances are positive or negative and that the perceiver (P 2 and P7) needs to see positive affordances in order to find the objects or places usable. If the affordances are negative, then – as the participant says – he cannot go to Cardiff at all. If the affordances are negative, Participant 2 cannot use her laptop. They both say there are no other options. Their technologies, in this totality of equipment, all have to work in an inter-relationship of positive affordances, i.e. all having to be positive, in what Sanders (1997, p. 97) calls a 'coalescence of affordances'. When he is able to go to Cardiff 'in-order-to' (*do* his work of vocational counselling), Participant 7 is participating in the practices of the workplace. When Participant 2 can use her laptop, she can use Voice-over-Internet Protocol software 'in-order-to' connect to her office on the third floor and her clients around the country, run her business and participate not only in the practices of her business, but with the wider world. Access to the totality of equipment, in socio-material contexts, amounts to participation in practices when the affordances of these technologies are positive.

Furthermore, these technologies have spatial connotations. In **Records 43-47,** the technologies are located in accessible workspaces to afford work. The affordances of the technologies in these spaces have to be positive, and in a totality of positive affordances of both space and technologies, for this spatio-material relationship to work at all.

Some participants rely heavily on the technology without which they would not be able to participate – at all **(Records 46-47).** Both examples illustrate what happens when their equipment suddenly becomes present-at-hand – 'game over!' (P2) and 'now I can't do anything with that computer!' (P6). What had been usable has become unusable. A Gibsonian

interpretation here would be that affordances, once positive, now become negative. Leonardi (2011, 2013b) and Treem and Leonardi (2012) theorise socio-materiality as a patterned, imbricated mesh in which human and organisational direction and intentions drive the patterning of what is socio-material. This is useful because Treem and Leonardi (2012) also use Gibsonian affordances in their study of people's use of social media and they recognise that the information for affordances then guides further actions in socio-material practice. When things become 'Game over!' (P2), people need to fix, rectify, throw out, buy new, upgrade, adapt, invent – or give up. I did not hear narratives of giving up, but rather of what people did to find solutions to the 'Game over!' situation.

## 5.5.2 The argument thus far

The argument thus far is as follows: in order to fit in to their communities of practice, to be a competent worker, what is presupposed is physical access to the built environment, regardless of mode of employment or type of distributed work. Furthermore, the primacy of space, place and the things in that space have heightened significance for people with mobility impairments, who may also have a complete reliance on their technologies in order to work at all.

The following theme addresses how participants learn, in the non-formal setting of workplaces, to find the information needed to effect these changes. Finding this information is fundamental to Gibson's (1986) theory of affordances, as is the learning implicit in it (E. J. Gibson, 2002). Cook and Brown (1999) consider that affordances have an epistemic dimension. They theorise that a 'generative' dance takes place between knowledge and knowing, as people deliberately seek out the information for what they need and want to do, using existing knowledge, in the course of their doing and knowing, to learn and to generate new knowledge through their interactions with others.

## 5.6 THEME 5: LEARNING IN PRACTICE (Records 48-61)

The argument of Theme 5 is that when people identify their spatial and material needs as specific, unique and personal due to their mobility impairment, they set about finding specific, unique and personal solutions. In this goal-directed behaviour, learning takes place, often in unstructured ways, as solutions are sought to manoeuvre around potential barriers to access and participation. Learning in this sense is about gaining an understanding to a problem often by finding the information for affordances (to make space, place and things usable).

The theme is exemplified in **Record 48** and repeated here:

> From experience, I can find ways around my impairments. You learn as you go along. (P2)

In communities of practice, defined by Wenger-Trayner et al. (2015) as social learning systems, people learn in non-formal ways as they actively engage in a process of *becoming* a more competent member, a more experienced member and a more knowledgeable member of that community of practice. Learning this way is learning to *be* (D. Thomas & Brown, 2009).

**Record 49** illustrates how non-formal learning can sometimes be structured learning. In this example, in certain types of reports, where laboratory work has indicated a diagnosis of cancer, Participant 1 discusses her findings with another pathologist to reflect on her findings, read articles and learn from the interaction. The way I understand Heidegger and Wenger on identity in practices is that these activities are part of the practices of *being* and *becoming* a competent pathologist, with competence arising out of experience and engagement in those practices in a process of learning.

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Orlikowski (2002) has looked for and has tabled the knowing-in-practice that she identified in an empirical study using a sample of software engineers, managers and executives, to find out what was learned in the software company. Using this as a guide, in the table (*Table 5.1*) below, from **Records 50-61**, I have extracted the personal problem identified and the learning that took place to find the solution and establish the kinds of practices and activities that constitute this learning (also Gherardi (2004)). The table below (*Table 5.1*) shows that information to solve problems came through a variety of strategies, to make things work and make them accessible in order to 'fit in' with the work practices of their business and professional lives in their communities of practice.

| IDENTIFY THE PROBLEM | IDENTIFY THE LEARNING | RECORD |
|---|---|---|
| I needed adaptations … | I had to present a case … <br> I had to investigate a grant from Access to Work | 50 |
| I needed to know … | I had to look up the legislation | 51 |
| I needed things <br> I wanted things <br> Who do I go to? <br> Who do I speak to? <br> What could work? | It was difficult to find this information when the solutions weren't there … <br> I do things, experience things, find out about things… I've got an open mind about finding solutions <br> I had ideas that weren't around yet … | 52 |
| I wanted to … | I've expanded what I've learnt in practice … <br> It's about tapping into what's out there ... | 53 |
| You need to know where to get the information you need | You need to know about (software upgrades) and what will work … | 54 |
| When things go wrong … | You walk through the lab and we'll examine the process … <br> You learn … from your mistakes… <br> Try to do root cause so that we find the actual cause, not what appears to be the cause … | 55 |
| I could not use … | Made me look into … <br> I researched … <br> I did the wrong thing … <br> What an expensive lesson! <br> I was forced to invent … | 56 |
| I can't use this … | I asked my boss … she said 'no'… I did some work to find out what was better that I can use … | 57 |
| When Skype crashed … | I called in the IT guy for a meeting to see what we could do to get going again ... <br> I was quizzing our IT guy… | 58 |
| It did not work for me | I looked for better solutions <br> I talked to other people <br> I read | 59 |
| I needed to solve the problem … | I investigated the possibilities because I had to find a better solution … <br> I did my homework … I solved the problem. | 60 |
| I need to get to … | I researched … <br> I made a lot of calls … <br> I Googled … <br> To get the correct advice, I  … | 61 |

**Table 5.1: Identifying the problem and the learning that took place**

Some organisational studies have focused on 'when things go wrong' to find out what is learned in such situations by looking for the 'knowing-in-practice', as I have done in the table above (Gherardi, 2004, 2006; Gherardi & Nicolini, 2000, 2002). When the participants 'needed' to do things (a word used numerous times in examples in the table above), they employed a variety of strategies to find the information in order to effect solutions. In these interactions, purposefully and through goal-directed behaviours, they identified the problem or barrier, then took steps to find the information in order to learn, fix and move on, or work around the problem, where possible (Eraut, 2000, 2004, 2009; Gherardi, 2004; Gherardi et al., 1998; Nicolini, Gherardi, & Yanow, 2003a; Nicolini et al., 2003b). In the metacognitive processes of problem solving and decision-making, critical and creative thinking were harnessed to find unique solutions to unique problems and barriers (Presseisen, 1991). Participants were able, through 'metacognitive experiences', to 'select, evaluate, revise and abandon' goals and strategies in accordance with 'metacognitive knowledge' (Flavell, 1979, p. 908).

When, for example, the 'laptop didn't fizz' (**Record 42**), this meant that the participant could not access *related* technologies and practices either. The Internet, Voice-over-Internet Protocol software and a whole *range* of the practices that comprise running the business were now brought into focus as present-at-hand – unavailable, unusable – and a problem to be solved. As Mulhall (2005, p. 49) explains Heidegger on this: however self-contained an object is, it is still encountered 'within a world of work', now inconveniently 'brought to our explicit awareness'. This is particularly so with communication technologies which enable participation and being-in-the-world. Many of the examples in Table 5.1 above relate to finding

solutions that enable (fully functioning) communications in their communities of practice – and the wider world.

We understand what a hammer *is* when it becomes non-functional (Palmer, 1969). When Participant 6 was no longer able to press the buttons on his telephone, the issue of communication with the world suddenly came to the fore in the 'unavailability' of the technology. As he told me, he went to America in search of a solution. When this did not provide a satisfactory outcome, what was triggered was further research to finally solve the problem **(Record 56).**

Some adaptations to space or technologies would be what Heidegger regards as temporary, while others need more 'reflective planning' (Dreyfus, 1991, p. 72). If the hammer is too heavy, then a lighter one may work, in which case the unavailability is transitory and a lighter hammer then becomes ready-to-hand and usable. Some of the adaptations needed for the participants did fall into this category and quick, easy fixes solved the problem. Most participants volunteered, for example, that their mobility impairments had also affected the use of their hands, arms, shoulders or necks (P1, P2, P3, P4, P5, P6, P7, P8, P11) and quite a number of these added that to get around this, they had obtained headsets to answer and make calls. Others had installed voice recognition software to limit the amount of typing that they did, often using mainstream software or technologies.

However, by and large, the state of present-at-hand was more a process than a state, as presented in Heidegger's work, because the participants had to initially identify the problem, then research the solution and then action it so that the technology or space could become usable. Whether this involved talking to others, or obtaining agreement or permission from others to make changes or obtain funding, or any of the strategies

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employed in Table 5.1, there was a process, not a binary and static state, more akin to the dynamic affordance of which Cook and Brown (1999) theorise. In their view of learning in practice, which aligns with the work of Wenger (1998) and is also predicated on people's identities (of *being* and *belonging* in communities of practice), affordances are dynamic and implicated in learning as people engage in 'real work' (Cook & Brown, 1999, p. 387). Learning here takes the form of a 'generative dance' mentioned above, between knowledge and knowing, as 'the activity of addressing facilities and frustrations dynamically affords knowing' (p. 390). When things appear as spatially negative affordances (too steep, too high, too narrow or too stepped, for example), this can act as a way of structuring people out of practices, in the taken-for-granted ways which I discussed above (in sections 5.4.1 and 5.4.2).

In Wenger's work, active engagement in practices is a key element of *belonging* and participating. Participants, as I have recorded, very vocally said that they would not be working without positive affordances of space (through flexible work arrangements) and technology fully functioning. 'Technology has to be my friend' (P6) epitomises this relationship between the participant and his technology, on which he was totally dependent. When space, place and objects are not usable, it is through learning to solve the problems that they might be made usable, accessible and available. Brown and Duguid (1991, p. 47) express non-formal learning in specific practices as a reactive, situational process:

> Like a magpie with a nest, learning is built out of the materials to hand and in relation to the structuring resources of local conditions.

What participants learned from information collected when they tried to solve problems in practice depends very much on these 'local conditions' to which Brown and Duguid have referred. This contextual reference is clearly also inclusive of the

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impairment as one element of their referential whole. J. J. Gibson (1966, p. 285) found that:

> in general, learning is all important [to detect affordances]… The child learns what things are manipulable and how they can be manipulated… and so on without limit.

What is learned to solve the problems is the information needed to manipulate affordances in order to make space, place and objects usable (E. J. Gibson & Schmuckler, 1989). But things do not always work according to plan, despite the learning, the research and the efforts made in practice, as Participant 6 told me when things did not work out and he had found himself close to tears on more than one occasion. Different participants gave various examples of mistakes they had made, through lack of experience, knowledge or confidence. In one example, where Access to Work had provided the funding for a computer, following a participant's research into what was available his employer then appropriated that computer. The participant, not knowing his rights, was left without the computer when he resigned. Participants also mentioned regrets about asking for flexible conditions that mitigated against their progress at work (P1) (as in the Johnson et al. (2012) research).

## 5.6.1 The argument thus far

The argument thus far is this: workers with mobility impairments, in their efforts to fit in to their communities of practice as competent practitioners, recognise the primacy of the spatiality of the workplace and the built environment, regardless of whether they acknowledge a disabled identity or not, or regardless of their mode of employment or flexible work arrangements. Learning in workplaces is often unstructured and is a case of consciously identifying a problem and researching, often as steps in processes, to solve the kinds of problems described in Table 5.1. In the

example given in **Record 56,** the participant first tried a local solution, before he went to America, where he learned that he would have to do further research to invent his own solution. Creatively inventing his own solution (having worked through stages in the process), in order to be able to make and receive telephone calls, meant that he could work remotely from a home office and therefore, participate in his community of practice and connect with the wider world. The problems he faced all related to making space, place and technologies fully functional to be able to work remotely – and to work at all.

Theme 6 draws the themes together towards a holistic view of the people, their spaces and their technologies, as a totality of practices that show how workers with mobility impairments can manoeuvre negative affordances into positive ones in some cases, to be able to work at all.

## 5.7 THEME 6: DOING THINGS DIFFERENTLY (Records 62-73)

The argument of Theme 6 is that, from the information learned, workers with mobility impairments might be able to manipulate negative affordances into positive ones, to make space, place and things usable in specific, unique and personal ways, often to be able to work at all. When space, place or objects present with negative affordances (making them unusable) workers find specific, unique and personal solutions. Unless and until there are positive affordances for space, place and objects, these workers might not be able to work at all. Making things work means doing things differently, doing things better and doing different things ((Eraut, 2000, 2004, 2009). In stepped processes, participants attempt to manoeuvre negative affordances to become positive and usable and to achieve their broader goal of 'fitting in' (as outlined in Theme 1 above). From a Heideggerian perspective, and similar to Gibson's affordance theory,

'manipulability' is implicated in practice and what we do. Of this, Heidegger (1962, p. 98) says: 'The hammering itself uncovers the specific 'manipulability'… of the hammer.'

This theme is exemplified in **Record 62** in the Findings section, repeated here:

> I tried and tried and tried again, until it eventually worked the way I needed. (P2)

Although the participants all needed spatial adaptations of different types to accommodate their impairment, not all needed adaptations to the technologies in it (for example, **Record 63)**, but three participants agreed that technology meant more to them (P4, P7, P11) than to their non-disabled colleagues.

For the most part, when affordances of space, place and technology were negative, participants were either able to effect 'quick-fixes', or – if exchanging the heavy hammer for a light one was inadequate – they went about researching the solution to their problem. This meant, effectively, changing technologies or changing practice (as in Leonardi and Treem's (2011) research) through 'metacognitive experiences' (Flavell, 1979, p. 908) and processes of trial-and-error, assessing the options, reflecting-in-action and -upon-action, sourcing advice and sometimes creating personalised solutions. These are metacognitive processes which bring about critical and creative thinking, in reflection-in-action (Presseisen, 1991).Where technologies are inflexible, either technology has to change, or practice needs to change (Leonardi, 2011). Making things usable was a combination of both, in most observable cases in my study.

Participant 6 had found that when mainstream products were unavailable to solve his problem, he had to invent his own solutions (**Record 64).** This is the spontaneous,

'reactive learning' that Eraut (2000, p. 115) associates with experience, ideas, planning, decision-making and problem-solving.

Doing things differently amounted to 'a different way of living' (**Record 65**) when Participant 5, who is unable to sit, conducts meetings partly standing, but mostly lying on a portable bed that she has to take to meetings. By doing things differently, the participant is able to participate in the practices of her recruitment business and make this way of living 'doable' as she told me.

Because practices change, the learning in it is dynamic, according to Eraut (2004, p. 264), who views competence as a 'moving target'. When technology is flexible and customisable (for example, software), experience, know-how and the ability to generate options from a variety of possible solutions, whether under pressure or reflectively, are all part of learning to be a competent worker (Eraut, 2004). In **Record 66,** Participant 8 described how she transcribed minutes of meetings from a dictaphone using a foot-pedal to stop and start the speech – but, not being able to use her foot, imaginatively used it as a hand-pedal on her desktop to stop and start the transcriptions of the meetings. When the foot-pedal had a negative affordance, the participant was able to manipulate it into a positive one by using technology in a way not originally intended (as in Eriksen, 2001, Mazmanian et al., 2013, Wajcman, 2008), to effect a (semi-) satisfactory solution to typing the minutes of meetings. Even if the operation was slow and tedious, the participant had 'made a plan'. When one participant found temporary negative affordances in getting to work in bad weather, she made arrangements to work from home, connected via her laptop to her office (**Record 67).**

Participant 1 (the histopathologist) and Participant 4 (the solicitor) arranged, via Access to Work, to install and use voice-recognition software to assist with typing, both having difficulties with hand/finger movement (as did other participants). When the positive affordances of technology were seen to offer positive affordances to their non-disabled colleagues as well, their employers rolled out this voice recognition software for the entire pathology department and the entire legal firm (**Records 68-69**). But what originally appeared to Participant 4 as a positive affordance began to show up as negative because of the effects on work practice that had worsening effects for him. He explained that prior to this, a secretary had typed the letters to clients, he had corrected them and she had then printed them. She had brought them back to him for signature and she then posted them. But with the changed practice that arose because of the roll-out of the software to the entire legal practice (to effect cost-savings and eliminate the use of secretaries), the participant found that there were now negative affordances for him *because* of his mobility impairment. He now needed to print his own letters, fetch them and take them to the post room, and he needed 'more mobility, not less' – ironically, *because* of the voice-recognition software that had initially been brought by him to the firm, as adaptive technology. To him, this introduced negative affordances, which he was not able to control. As Leonardi (2011) theorises, when technologies are inflexible, practice might have to change – and it did in this case. As Participant 4 explained, many of the practices like this are embedded in other practices and because of 'fitting in' (as in Theme 1), he had little option but to tolerate the new changes. Participants also adapted practice to accommodate their health/impairment (**Records 70 and 71).**

## 5.7.1 Imaginative, creative solutions

Two final examples exemplify how creative, imaginative solutions, created by and for their own purposes, to make things usable and in decisive, self-directed activity (arising from what was learned in practice), can make negative affordances positive in terms of space, place, objects and practice.

Generating new options from what was learned when things did not work for the participants resulted in imaginative and resourceful solutions, whether practice, technology or space was adapted, appropriated and rendered ready-to-hand.

Wenger (1998, p. 176) gives an example of the role of imagination in practice and its implication for learning, for identity and belonging:

> two stonecutters are asked what they are doing. One responds: 'I am cutting this stone in a perfectly square shape.' The other responds: 'I am building a cathedral.'

He explains this, not in terms of their competence (in know-how) as stone-cutters, but in terms of creativity, because what these two stonecutters will learn in practice will be very different things from the same activity (since they are on two different trajectories). The possibilities created by imagination draw us into past experience as we reflect on the possibilities for the present and 'envision possible futures' (Wenger, 1998, p. 178).

As Wenger (1998, p. 178) further says:

> imagination is a delicate act of identity because it plays with participation and non-participation, inside and outside, the actual and the possible, the doable and the unreachable, the meaningful and the meaningless.

### 5.7.2 Example 1

Participant 6 demonstrated and explained how, faced with a situation in which, without creative use of mainstream and adaptive technologies, coupled with and driven by his own imagination and motivation to find solutions, he would have been unable to work. As he said: 'I needed things, I wanted things. I had ideas that weren't around yet…' (**Record 52**). Inventing the solution that enabled him to use a telephone and headset and answer and make calls may have taken him a year to perfect and he may have described his invention to magnetise his headset as 'crude', but it enabled him to make and answer calls, by tapping his head against the back of his wheelchair, to initiate the process of making and answering calls (see the photograph associated with **Record 72**). This small 'crude' adaptation has major implications for him. However crude, his sense of wonder and invention drove him to solve a problem. Carlsen and Sandelands (2015, p. 375), investigating the role of 'wonder 'in organisational learning and innovation, see:

> wonder as relational and something that people may actively seek out in everyday responsive interactions, rather than grand miracles coming to them.

As J. J. Gibson (1986, p. 133) theorised, 'objects can be manufactured and manipulated' and the participant did, in the end – through trial-and-error, experience, analysing the situation, evaluating options and making decisions – invent the solution he needed to manipulate negative affordances. He had, this way, engineered his own participation, in doable and meaningful modes of engagement in the practice of *being* the town-planner who needs to communicate and engage with clients of his council, co-workers and management. As he said in Theme 1 above, he no longer felt a need to prove his competence at work – he *is* a competent town-planner. What enables work

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for him are positive affordances of space, place and objects – flexible work arrangements that are collocated with enabling, fully-functioning technologies.

### 5.7.3 Example 2

**Record 73** illustrates another example of imaginative, creative use of technology that enables work. This participant demonstrated how, being blind, she guides and advises her clients remotely (all over the UK), using voice-recognition software, magnification software and Voice-over-Internet Protocol (Skype) software to communicate with them. Likewise, she communicates with her staff (on the third floor and inaccessible to her).

In the photograph, the client has a learning difficulty and cannot read. Considering that the participant is blind, what makes this work is not only the technologies, but imaginative practice which involves complex higher-order thinking processes (as in Presseisen, 1991). The client in this photograph is holding up the document and the participant has an employee read it to her. Verbal advice is then given over Skype. The participant stated clearly that things cannot work any other way. What makes this work is the totality of functioning equipment in a 'referential whole' (Ilharco, 2002; Introna, 2002, 2008).

In both examples above, imaginative use of technologies, whether mainstream or adaptive, has enabled these workers to engage in the practices of their communities of practice. Designing 'what works' entailed using knowledge as a tool in the service of knowing to generate new knowledge (Cook & Brown, 1999) in order to participate.

In purposeful, directed ways, these participants encountered a problem, imagined a possible solution, implemented their personal, customised solutions, fine-tuned and

fixed, until things worked. As Wenger (1998) theorises, learning is a matter of learning to *be* (as in Theme 1 above) and implicated in what we *do*.

Finding a solution, explained phenomenologically, was a case of engaging equipment towards- which problems were identified, then solved (or not) for- the- sake- of making space, place and objects accessible and usable (or not), thereby obviating barriers (or not) in the process of being- in- the- world.

### 5.7.4 The argument thus far

The argument thus far is as follows: in order to fit in to their communities of practice, to be competent workers, what is presupposed is physical access to the built environment, regardless of the mode of employment or type of distributed work. Since the primacy of space, place and the things in that space has heightened significance for people with mobility impairments, who may also have a complete reliance on their technologies, these might present with negative affordances. When space, place and objects in the workplace present with negative affordances, people look for ideas from the information they consciously investigate to enable them to manoeuvre negative affordances into positive ones, in order to effect specific, personal and unique solutions, often to be able to work at all.

When these parts of the hermeneutic circle (the six themes) are seen in terms of their referential whole, work can be interpreted holistically as an issue of social inclusion.

### 5.8 A THEMATIC, HOLISTIC INTERPRETATION: POSSIBILITIES FOR ACTION AND POSSIBILITIES FOR BEING

The hermeneutic circle is more than a thematic analysis of the relationship between the parts and the whole. Rather, it is a 'to and fro' (T. Wilson, 2016) revision of understandings as fore-understandings percolate into something else to become more

developed and different abstractions from the original, intuitive analysis that had anticipated possible meanings. The process is one which is never fully cemented as final and definitive, but rather, is open to further revision, reflecting the circular nature of this kind of hermeneutic analysis. This process of analysis materialised organically over the life of the study. My fore-understandings of the topic originally had a focus on barriers in workplaces. But in the process of interrogating fore-conceptions and fore-understandings, and being open to finding new meanings from the phenomena observed and discussed, prior understandings gave way to new interpretations in terms of spatiality, accessibility and usability. These new understandings, which led to new interpretations, materialised in the course of uncovering layers of meaning arising out of the 'average everydayness' (Heidegger, 1962, p.276) of embodied, equipped and generic work practices. As we interpret, we learn and we change in historically and culturally-defining ways projecting towards the future, anticipating new understandings of phenomena (which would also explain why different researchers would foreground different understandings and arrive at different interpretations). The subtext of my own interpretation of spatiality, usability and the manipulation of possibilities for action (affordances), gives rise to a further abstraction – the Heideggerian notion of 'potentiality-for-Being' and 'potentiality-for-Being-in-the-world' (Heidegger, 1962). Our identities change in the process of engaged, embodied and equipped practice in ways that determine who we *are* – and who we can possibly *become*. 'Become what you are' (Heidegger, 1962, p. 186) is understanding our being in terms of future projections, self-interpretations and self-realisation. My understanding of this is that there are possibilities we encounter on our individual trajectories that enable us to reimagine ourselves in ways that change our identities as we project, interpret and anticipate our equipped, discursive futures.

### 5.8.1 Theme 1 – Identity and being-in-the-world

From culturally-positioned understandings of who we *are*, we interpret our 'worlds' in relation to others through our participatory practices. 'Everyone is the other, and no one is himself' is Heidegger's (1962, p. 128) way of overcoming the subject/object issue vis-à-vis participation in the world. Our projected understandings are forward-looking or goal-directed, having built on past understandings, located in present actions, with a future already pre-interpreted. When participants engage in work practices, they are sharing resources and equipment, entering a pre-understood and shared discursive world. In this case, their work environment – their world - is characterised by habituated, routinised, and mostly un-reflected-upon practices, with others in that particular workplace. Participants in this study defined themselves mostly in terms of their professional identities, in an ontological state of *being* or *becoming*, often by 'fitting in' with others in their workplaces. 'Fitting in' with others to become competent, accountable practitioners was also a matter of being recognised as such rather than a person defined by a mobility impairment. Where affordances are possibilities for action (and also forward projecting), our identities are also sites of change, as we share and negotiate our positions in participatory practice with others. Possibilities for action and possibilities for becoming can only become realities when space, place and equipment are accessible. Accessibility affords participation. Participation affords 'being-in-the-world' and realising the potential 'to become what you are' (Heidegger, 1962, p. 186). People manipulated present-at-hand situations to overcome potential barriers in workplaces – in order to fit in with others – and their professional identities. This means that 'towards-whiches' and 'in-whiches' of generic, embodied practice involve new understandings of equipped practice through adapting and manipulating practice, space or technology in order to achieve their 'for-

the-sake-ofs'. We are not defined by our current goals and 'towards-whiches' (for example, attending a quality assurance meeting) but by our future possibilities and 'for-the-sake-ofs' (in this example, *being* employed as a pathologist) – in other words, we *are* our for-sake-ofs which are realised in goal-directed, identity-changing behaviours.

## 5.8.2 Theme 2 – Spatiality: 'the world' and affective concerns

Participants spoke about 'my world' or an 'environment that facilitates my abilities' in the same way that Heidegger speaks of discursive, embedded and emplaced worlds. 'Being-in-the-world is spatial' (Heidegger, 1962, p. 145) and this was seen in this research. Ways of working for these participants, in their worlds, had spatial qualities, often foregrounded through horizons of understanding composed of accessibility, usability and sometimes affective concerns - frustration, annoyance and hurt, for example. Emotions were evident in many examples when space, place and equipment were inaccessible, present-at-hand and barriers to participation. As Smith et al. (2009) highlight, affective concerns are implicated in our identities. Moods, according to Mulhall (2005, p.76), 'determine our grasp upon the world' and 'colour every aspect of our existence. Or in Reckwitz's (2012) view, affects are embedded in embodied practices which themselves are embedded in interpretation. Adapting space and place was frequently a goal towards-which and for-the-sake-of-which participants shaped new understandings and opened up new possibilities for working in different configurations, in order to participate in the world. By re-imagining time and space (for example, by working flexibly from home, remotely) we create new images of both ourselves and our worlds (Wenger, 1998).

### 5.8.3 Theme 3 – Accessibility in the world

When people are excluded through physical barriers in the built environment, they are unable to participate in the world and in the world of work. Often inaccessibility co-existed with taken-for-granted and un-reflected-upon understandings of exclusion, sometimes first appearing as the 'way things are' in the built environment. A few participants viewed public space in terms of present-at-hand understandings of the generic practice of using public transport – as disabling technologies (the London transport system, uneven pavements, for example) – and reimagined their possibilities (of being) to avert the present-at-hand situations. What also came to light in the understandings of the built environment were actions implicitly projected unreflectively by colleagues of participants which resulted in *no* possibility for inclusion in practices. Not being able to access space and place means that the 'towards-whiches' and 'for-the-sake-ofs' are not possible at all.

### 5.8.4 Theme 4 – Equipment in the generic practice of 'doing'

Participants also spoke about emplacement, in the 'average everydayness' (Heidegger, 1962, p. 276) of equipped practice, where things in accessible space (their worlds) are positioned. Heidegger (1962, p.136) says that 'equipment has its *place*' (italics in original) where things are accessible or not. We are engaged in 'making room' by being 'concernfully absorbed' in such a way that in 'Being-in-the-world, space is proximally discovered in this spatiality' (Heidegger, 1962, p. 146). In the process of projecting in goal-directed behaviours, (anticipating horizons of understanding), we are producing intelligibility, integrating embodied expectations of equipment in participatory generic practice (T. Wilson, 2016). While the body can be viewed as a 'faulty tool' (Leder, 1990), wheelchairs, crutches, white canes (also equipment) have a

place in extending embodied space that give rise to possibilities of being-in possible worlds and realities as people reinvent themselves (sometimes after illness) to engineer their own participation (Toombs,1992). This way, they are:

> using history to see the present as only one of many possibilities and the future as a number of possibilities (Heidegger, 1962, p. 185).

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### 5.8.5 Theme 5 – Learning to adapt

Present-at-hand comes into view as unusable, inaccessible space, place and equipment. When faced with space, place or technologies that are unusable, in goal-directed behaviours, people make efforts to learn, often in the most novel and creative of ways, and in participatory practice, how to manoeuvre and manipulate barriers or potential barriers. Unless space, place and equipment is made accessible and ready-to-hand, the 'towards whiches' and 'for-the-sake-ofs' will not result in full participation in the world. Learning in practice can be a case of reflecting on equipment or habituated routines which may be brought to the fore through lack of accessibility or usability in which equipment or practice may have to be adapted or changed. In working in recognised genres (in professional practice, for example), presumed or projected behaviours, integrated with experience (that is aligned with competence and accountability), constitutes shared understanding in practice (T. Wilson, 2016).

### 5.8.6 Theme 6 – Ready-to-hand as engineering participation in the world

In goal-directed, forward-looking projected understandings of present-at-hand, participants, in social learning environments, actively pursued solutions to engineer their own participation in their worlds of work. Participants understood, then interpreted, then reimagined possibilities for inclusion. We reimagine through our projections, how things can be, often through doing things differently, doing things better, or doing different things. This comes about as we explicitly interrogate our

fore-understandings, revise them in practice and through trial and error, arrive at new understandings that lead to different routines, different practices or different equipment.

As Heidegger (p. 192) points out: 'In the projecting of understanding, entities are disclosed in their possibility'. Both potential for action (affordances) and potential for being and becoming are enabled when space, place and the things in that space, are accessible in the first place. People, in practice, using digital technologies, project eventualities (possibilities for action as well as for being) through understanding entities as equipment, producing intelligibility by integrating embodied expectation of equipment while participating through enabling generic modes of digitally being-with-others (T. Wilson, 2016).

## 5.9 SYNTHESIS OF THEMES

The thread of logic arising out of the themes can be synthesised into a broader interpretation of social inclusion.

The participants identified themselves primarily in terms of what they do in socio-material practice, whether or not they acknowledged a disabled identity. Practices being spatial meant that *being* a worker, in whichever mode of employment (as applicable), had spatial implications. Distributed work, seen in this study as flexible work arrangements, meant that some people work from home, connected via digital technologies which enable remote working. Spatiality also concerns place (that is, where things are placed in close proximity, in order to be useful and accessible to people with mobility impairments). Moreover, spatiality includes the built, physical (public) environment over which participants had less personal control (than private space) and barriers here amounted to exclusion from work practices. In their personal

spaces and (private) work environments, when specific, unique and personal needs arose, either of space, place, objects or practice, participants set about finding their own specific, unique and personal solutions. Through purposeful action, participants made decisions relating to solving the problem (even if this amounted to taking no action at all). Resolving the issue (or not) meant doing things differently, doing things better or doing different things (Eraut, 2009). While some changes to technology, space, place or practice were simple and easily organised, others required imaginative and creative use of technology, practice and spatiality to be able to work at all.

From this I draw a few tentative conclusions arising out of the phenomena: where and how work takes place for people with mobility impairments, and in answer to the research questions.

1. Flexible work arrangements have spatial qualities which are of importance to people who may not be able to work in standard work configurations;

2. Taken-for-granted exclusion from participation sometimes begins with physical barriers in workplaces;

3. The primacy of space and the placement of objects in it, are of heightened significance to people with mobility impairments in workplaces;

4. For some people, there is a complete reliance on a totality of inter-related technologies which allow them to 'fit in' with their communities of practice, in order to participate;

5. When confronted with specific, unique and personal potential or actual barriers to access and participation in workplaces, people consciously set about finding specific, unique and personal solutions in order to participate;

6. What people learn in metacognitive processes and in response to potential or actual barriers, is how to manipulate negative affordances of space, place and

technologies into positive affordances, often in the most creative of ways, by doing things differently, by doing things better, or by doing different things, in order to participate in work practices.

These conclusions will be further discussed in Chapter 6 following, the concluding chapter.

## 5.10 SUMMARY AND NEXT CHAPTER

This chapter has presented the six themes as parts of the hermeneutic circle and has ended with a synthesis of new understandings of the phenomena in terms of a referential whole. Through the lenses of affordances and Heideggerian phenomenology I have interpreted the usability of space, place and object in it, leading to six key findings which will be further discussed in the final concluding chapter below. In the following section, I will revisit the social model of disability taking into account that it disavows bodily considerations and is a social, not individual theory, in relation to my findings. I outline identified limitations, implications for policy, practice and research and suggest further avenues for research. I begin and end the chapter with a few reflections on the project.

# CHAPTER 6 - CONCLUSION

## 6.1 OVERVIEW OF THIS CHAPTER

In this final chapter, I review the rationale for the project (in relation to the research questions I asked) and, in particular, the value of the findings and their potential value to policy, practice and other researchers. I also indicate the limitations to the research and conclude with ideas for further investigation (which either emanate from my findings, or were issues I was unable to investigate).

## 6.2 REFLECTIONS

When I was asked, at the proposal stage of this thesis, why mobility impairments are of any interest since wheelchair-users roll up to desks and presumably work like everyone else, I found the question difficult to answer, not having begun the research. At that time, I intuitively felt that there must be reasons why more wheelchair-users are not sitting at those desks and early readings of policy documents and grey literature (for example, from charities) indicated that disabled people are under- and unemployed (as I stated in the opening to Chapter 1). My curiosity about this grew when I found participants at desk-based work particularly difficult to locate in workplaces (as discussed in Chapter 3). I had written to a few professional bodies asking them to advertise my request for participants. This strategy yielded only one participant – a solicitor. Another professional body wrote back stating that to the best of their knowledge, *none* of their members had mobility difficulties (architects). The puzzle deepened when I considered that a lot of professional work is desk-based, but very few professional people with mobility difficulties are represented in the professions. During the research, the pathologist, solicitor and accountant all confirmed that they did not know other doctors, solicitors or accountants who were

wheelchair-users. The doctor confirmed that the rules for entry to medical school allow wheelchair-users to enrol (with a few provisos). My research did not resolve this early question but it did lead to an investigation of the meaning of spatiality for these workers. The strange perceived relationship between competence and walking to which I alluded in Theme 1, while unresolved by me in this research, was nevertheless refuted by the actions of those participants who had mentioned it. These participants clearly showed higher-order critical thinking associated with metacognitive processes deployed when they sought to convert, often in highly imaginative ways, negative affordances into positive ones. In this way, they adapted spatiality and the technologies in that space and thus demonstrated their competence in their communities of practice.

When I saw how participants were able to adapt the spatiality of their immediate, equipped 'worlds', I intuitively felt that there could be a real opportunity, with modern technologies, for more people with mobility impairments to engage with flexible work arrangements and different modes of employment in order to work in a variety of spatial work configurations. At the end of the process, I feel confident that modern technologies which are enabling distributed work practices for *all* workers, could increasingly be a way forward for employing more people with disabilities in general.

## 6.3 ORIGINAL AIMS AND KEY FINDINGS

I had originally anticipated a project that expressly looked for barriers facing people with mobility impairments at work. However, by using a methodology that isolates the phenomenon as its unit of analysis, this became a study that exposed potential and actual barriers seen from a vantage point of the usability of space, place and technologies. By using an affordance lens and other commensurate, compatible

theories and literature (as discussed in Chapter 2), potential barriers were exposed by identifying affordances as enablers or not of what amounted to accessibility, participation and inclusion (evidenced in Chapters 4 and 5). In terms of the affordance approach, when affordances are negative, people attempt to solve problems, often in the most imaginative of ways, in order to make space, place and objects usable. Furthermore, when affordances present as 'non-affordances', sometimes people are able to create positive affordances for which hitherto they had had no need.

The research design included a particular focus with regard to the ethics of a non-disabled researcher researching disability. The benefits of operating in an ethical, responsible and respectful way to participants and their data, particularly by not having asked for unnecessary biographical and health-related questions, were four-fold: (a) they enabled me to concentrate on the phenomena, not the individual; (b) this enabled me to work in a way naturally compliant with the social model; (c) one participant thanked me for not having asked personal questions; and (d) people volunteered very personal information which I was not expecting to hear.

The research questions asked how professional and managerial-level personnel with mobility impairments use digital technologies at work, how affordances can be revealed in phenomena as seen and what interpretations can be made therefrom.

## 6.4 RESEARCH QUESTIONS AND KEY FINDINGS

There are six key findings arising out of the phenomena: where and how work takes place for people with mobility impairments:

1. Flexible work arrangements have spatial qualities which are of importance to people who may not be able to work in standard work configurations (see Section 5.3);

2. Taken-for-granted exclusion from participation sometimes begins with physical barriers in workplaces (see Section 5.4);

3. The primacy of space and the placement of objects in it, are of heightened significance to people with mobility impairments in workplaces (see Sections 5.3 and 5.4);

4. For some people, there is a complete reliance on a totality of inter-related technologies which allow them to 'fit in' with their communities of practice, in order to participate (see Sections 5.2 and 5.5);

5. When confronted with specific, unique and personal potential or actual barriers to access and participation in workplaces, people consciously set about finding specific, unique and personal solutions in order to participate (see Section 5.6);

6. What people learn through metacognitive processes and in response to potential or actual barriers, is how to manipulate negative and non-affordances of space, place and technologies into positive affordances, by doing things differently, by doing things better, or by doing different things, in order to participate in work practices (see Sections 5.6 and 5.7).

## 6.5 IMPLICATIONS FOR POLICY, PRACTICE AND RESEARCH

People with mobility impairments are not a homogeneous sub-group of disabled people - itself not a homogeneous aggregate. Affordances, too, are as heterogeneous as the people using the space, place and objects from which they are perceived. Gibson and Schmuckler's (1989, p. 6) long list of adjectives describing a surface illustrates this very well. A surface, for example, can be flat, uneven, greasy, sloping, wobbly, moving, rough, sticky, slippery, soft, uneven - a list which they describe as but a 'partial inventory'. These numerous adjectives will be perceived differently by different users of a cane, a manual wheelchair that is pushed, one that is self-propelled

or an electric wheelchair. They will also be different for a blind person or a person without a mobility impairment at all and will not even be the same for the same kind of users. This further illustrates why there can be no simple solution that can work for all employees with mobility impairments in practice and why individual, personal solutions will always be necessary even though public policy deals with macro-concerns. Roulstone et al. (2003) found that there is no one universal, single policy or practical strategy that will work for all employers, or all employees. This applies to my results as well. While policy tends to generalise, examples of why no one strategy can work for all, is exemplified in my study where two men, both with spinal cord injuries, both having upper-body strength and both self-propelling in wheelchairs, have completely different spatial needs. Despite the commonalities of having a mobility impairment, negative affordances of standard offices (no suitable bathroom facilities) meant for one that he usually *has* to work from home. For the other, this aspect of spatiality is not a negative affordance and he works solely in a standard office.

### 6.5.1 Inherent tensions between micro-research and macro-policy

How micro-research converts into macro-policy is problematic. In the UK (and in America) most social policy is predicated on 'evidence-based' policy and in this paradigm, what counts as 'usable evidence' (Sedlačko & Staroňová, 2015, p. 40) is 'expert discourse' (p.17). Evidence-based expert discourse often simplifies and reduces facts and statistics into causalities, probabilities and predictions for policy targets, key performance indicators and audits. But according to Geyer (2012), policy considerations may actually be more complex, more contingent, more partial, more emergent, more chaotic and more interpretive than in such an evidenced-based paradigm. As such, K. Smith (2014) posits that ideas, not evidence, are what travel

between research and policy – an appealing way of thinking about how relatively small-scale qualitative research such as mine can add to the existing body of research to inform macro-policy.

Contentious as policy reform may have been through successive governments in the UK to find alternative solutions to social problems (for the UK's 'Big Society' or the 'Third Way' in the current and previous governments respectively), there is the wider problem of the tension between the individual and the macro-social (Baggott & Jones, 2015). If (in considering small-scale qualitative and phenomenological research endeavours as evidence), this is a case of 'epistemic politics' (Sedlačko & Staroňová, 2015, p. 11), there remains a new issue: what do small-scale observations occlude if one wants to make such research upscalable, for surely observation *does* occlude whatever else does not appear in the purview of the researcher at the time.

Perhaps 'citizens' knowledge' (Sedlačko & Staroňová, 2015, p. 43) could be seen as evidence that counts - to transcend the micro/macro binary. This requires, in the view of Coulter (2001, p. 37), attention to the ontological premises underlying both:

> In my view this must involve, and in the first instance, an analysis of the ontological problems arising out of a consideration of the nature of macro- (as well as micro) social phenomena, from the solution of which significant methodological implications may be derived.

Perhaps new methodologies are indeed required as suggested by Law and Urry (2004). As the link between policy and research stands in the early part of the twenty-first century, upscaling small-scale research that uses micro-theory to interpret phenomena remains a limitation, as I suggest below. Despite these problems of upscaling small-scale qualitative research for policy, by studying phenomena, my findings have implications for research on affordances and for research on disability.

### 6.5.2 Implications for research on affordances

One implication for research on affordances is that when Gibson's (1986) theory is used in its original formulation (and clarified by E. Gibson (2000, 2002)), then the theory has practical value, particularly when affordances are treated not as static binaries, but as dynamic, in the course of 'doing' in practice. I first came across this contention in the work of Cook and Brown (1999) and was able to demonstrate that affordances are dynamic in empirical research and can sometimes therefore be configured. My research suggests that people can change affordances by manipulating and manoeuvring negative or non-affordances to become positive affordances. In the example of E. J. Gibson and Schmuckler (1989) above, when affordances are negative (for example slippery, cobbled or greasy surfaces) to people using canes and wheelchairs, people can – through intentional actions and guided by what they know and learn in practice – solve problems and take action to make them positive, therefore obviating barriers. Not having found prior research on manipulating affordances I would like to see how this could be further researched and perhaps used in employment practice to actively make space, place and technologies usable by manipulating negative or non-affordances into positive affordances.

### 6.5.3 Implications for researching disability using phenomenology

My findings also suggest that hermeneutic phenomenology is an ideal methodology chosen to study disability, work practices and taken-for-granted understandings, because it is also linked to usability of space, place and objects. It is an illuminating way to study disability in workplaces because it focuses on phenomena, not people and their impairments. In this way, it accounts for access and barriers by investigating

what is ready-to-hand and usable, or not. This is directly tied to participation, as being-in-the-world.

## 6.6 LIMITATIONS

In working on this study, I have identified a few potential tensions and limitations.

### 6.6.1 Generalising from interpretive phenomenological findings

According to Lincoln and Guba (1985), the aim of qualitative research is not to generalise, but rather to hope that one's reader finds the work transferable and recognisable in other similar contexts. This broadly resonates with two questions which have guided my overall approach. The first is Wenger's (2011) question: 'What story do you (the researcher) wish to tell?' The second is Silverman's (2006, p. 66) question: 'What is going on here?' The answers to both give the researcher the freedom to interpret qualitative data, with the implication being that another researcher, using different research strategies, might well arrive at different findings. Not being able to generalise from the interpretative findings of a phenomenological small-scale investigation is the biggest limitation because it brings into question the value of such studies to macro-policy. Simultaneously, what comes to the fore is how macro-policy is formulated, how the dualities of 'individual' and 'social' are addressed, and whose interests are best served in the creation of social policy.

### 6.6.2 Micro-theory vis-à-vis macro policy

The use of the kinds of theory I have used may also pose a problem for upscaling small-scale research to address macro-concerns (Schatzki, 2014, 2015). Affordance theory and the family of practice theories I have used (as in Chapter 2) are micro-theories relying on individual perceptions and phenomena. This causes a theoretical difficulty in Schatzki's view, because social life is simply too complex, too detailed

and too contingent to upscale in any meaningful way with existing theoretical and methodological constraints. This also aligns with the problem of upscaling small-scale qualitative research for use in evidence-based policy with its different paradigmatic commitments as I suggested in Section 6.5.1 above.

### 6.6.3 Tension between the different theoretical lenses

Additionally, there is the tension between different elements of micro-theory used. In practical research, it was not possible to investigate phenomena without dealing with, for example, the very real bodily impairments of people in relation to the phenomena which were revealed. This might be considered a limitation from an orthodox social model perspective which eschews individual impairments in favour of societal barriers. From an affordance perspective this is not a limitation and people's individual perceptions of what is usable or not is germane to that theory.

### 6.6.4 Sampling

My sample is small and purposive and my sampling technique attracted participants who turned out to be 'successful mainstream adapters' (Zola, 1982). As Zola points out, examples of successes should not be generalised in a way which exemplifies their successes at the expense of examining what is really happening for the vast majority of disabled workers in poorly paid, low-level work. Furthermore, not considering intersectional factors (age, gender, ethnicity, education, etc.) might be considered a limitation although hermeneutic phenomenology is concerned with exposing and interpreting phenomena, not investigating people's lived experience.

### 6.7 IDEAS FOR FURTHER RESEARCH

Ideas for further research all pertain to areas that I was not able to research myself, which also concern how some of the limitations above might be addressed.

1) How to upscale small-scale practice-based qualitative research for macro-concerns and policy (influenced by Schatzki (2014, 2015));

2) What research methodologies could be developed to do this (influenced by Law & Urry, 2004; Nagel, 1974; Reckwitz, 2012);

3) Why there is a perceived link between walking and competence (mentioned by four participants);

4) Why so few professional people are disabled and in work;

5) Disabled people as employers of people other than carers;

6) The importance of communications technologies for people with disabilities, working remotely.

## 6.8 FINAL REFLECTIONS

Unlike M.J. Oliver (1999), who claimed that his disability was 'the best thing that ever happened to me', Participant 7 (reflecting Hughes's (2007) view that impairment is neither desirable nor exotic) described his spinal cord injury as having been devastating. Firstly, 'it's not a career move that people aspire to – it's a kick in the stomach'. Secondly, and related to this, he said:

> You left home. You were able-bodied and everything was fine. You had your car accident... you come back as a different person. You have to dig quite deep to come out of this sort of thing, come to terms with it, get your head around it.

What these opposing views from two disabled people reinforced, at this final stage of the process, was what a contested area disability is. Indeed, in answering the research questions, new puzzles emerged as I have indicated above which are in need of further research.

The most disquieting realisation is that no amount of research or well-intentioned social policy and legislation has to date effected 'the' solution to remedy the

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imbalance in work opportunities for disabled workers in general. The issues are discussed decade after decade, but the basic underlying questions remain unanswered. Rogers (2009) cites an example of an accountant in 1934 (in the middle of the Great Depression) who could not find work for precisely the same reasons as I am researching over 80 years later. His experience was that he could not compete with non-disabled accountants, that there was prejudice against him by employers because he could not walk and that the only option available was self-employment. The obduracy of this prejudice – despite enlightened, humanistic labour legislation promoting equality and heightened awareness of the fallacy of discrimination – is the final anomaly.

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# APPENDIX 1 - SEARCH ALERTS

# APPENDIX 2 - NOTEBOOKS

# APPENDIX 3 - LITERATURE DATABASE



| BookandPage | Keyword | Author | Comments - MUST state below when used and in what section |
|---|---|---|---|
| h12 | affordances | Sanders | |
| h20 | affordances | Sanders | |
| h42 | affordances | Letiche and Lissack | |
| h44 | affordances | Bloomfield et al | |
| h62 | affordances | Gibson, E | |
| c61 | affordances - agency and structure | Leonardi | |
| a53 | affordances - bundles of features | Faraj and Azad | |
| c16 | affordances - critique | Chemero | |
| c18 | affordances - critique | Oliver, M | |
| c15 | affordances - empirical evidence | Gibson, E | |
| e40 | affordances - subject/object | Sanders | |
| c14 | affordances - time | Schmidt | |
| a57 | affordances and contraints | Leonardi | |
| c36 | affordances and learning | Billett | |
| h60 | affordances and mobility | Gibson, E and Schmuckler | |
| c15 | affordances and practice | Gibson, E | |
| c18 | affordances and technology | Oliver, M | |
| h24 | affordances and the body | Dohn | |
| c64 | agency | Suchman | |
| c67 | agency | Pickering | |
| f42 | agential and critical realism | Leonardi | |
| c54 | agential realism | Barad | watch out for commensurability issues |
| e63 | air travel example | Introna | |
| e21 | airline example | Heidegger | |
| e21 | airline example - explanation | Dreyfus | |
| h47 | alternative ways of being-in-the-world | Michalko | |
| e18 | analogies | Geertz | compare with Law and Urry also Heidegger 'seeing as...' |
| b18 | analytic integrity of affordances | Parchoma | |
| b35 | ANT | Fenwick | |
| g13 | ANT | Edwards | |
| c42 | ANT - critique | Pels, Hetherington and van der Bergl | |
| c43 | ANT and disability | Winance | |
| c46 | ANT and technology | Feldman | 2007 |
| c67 | ANT- critique | Pickering | |
| c44 | anthropolical perspective of technology | Suchman | |
| b70 | applied theory | Storberg-Walker | |
| j21 | appropriation | Ricouer | |
| h5 | 'as if' worlds of possibility | Holland et al | |
| f25 | assistive technologies | Blume | |
| j2 | assumption that paid work means social in | Roulstone | |
| j3 | assumption that paid work means social in | Roulstone and  Barnes | use in Policy |
| g58 | audit | Paley and Eva | narrative vigilance |
| g66 | audit | Lincoln and Guba | |
| f37 | audit trail | Rodham et al | |
| h5 | authoring the self | Holland et al | |
| i15 | authoring the self | Holland | see Wenger's comments in pencil |
| e6 | axiology | Lincoln and Guba | |

**APPENDIX 4 (1/2)** **AUDIT TRAIL** based on Lincoln and Guba's (1985: 385) procedures for auditing, and on Trowler's (2015) alignment criteria in research

| Events | Details | Evidence |
|---|---|---|
| **Set up audit procedures** | Audit is an ongoing process, not an event | Audit trail document – digital Principles: transparency, privacy, anonymity; research with people not on people |
| **Raw data** | Digital recordings | Olympus recorder, encrypted flash drive (backup), printed, filed |
| | Transcripts | All conversations transcribed by myself, filed |
| | E-mail | For follow-ups, new discussions. Printed, filed |
| | Observations | Recorded where possible |
| | Telephone calls | Recorded, printed, filed |
| | Photographs | Chapter 4 |
| **Participant selection** | Criteria : mobility impairment/currently in work/using computers/adults | Advertisement to find participants through Scope (P6), personal contacts (P8,P11), professional organisation (P4), disabled professional organisations (P1,P2,P3,P5,P9,P10), snowball (P7) |
| **Data collection** | Conversations, observations, email | Safety precautions. Ethical vigilance |
| **Data reduction and analysis** | Phase 1 (main database) Phase 2 (selection from main database) Phase 3 (categories) | Word documents and mindmaps |
| **Data reconstruction and synthesis** | Phase 4 (themes) Phase 5 (microanalysis and synthesis) | |
| **Methods** | 1. Conversations 2. Observations 3. E-mail 4. Telephone calls 5. Follow-up checking of meanings 6. Photographs | Written consent – filed; Photographs emailed by participants with written consent (a) for printed thesis and (b) for digital version. Face of participant's client blurred to respect anonymity (Fig.4.4) |
| **Literature** **APPENDIX 4 – (1/2)** | Articles (paper) referenced to notebook pages (paper)/Endnote reference checked and entered in notebook pages (paper)/Folder (digital) for downloaded articles | Notebooks (A-J) Database in MS Access (keywords) |

| Events | Details | Evidence |
|---|---|---|
| **Trustworthiness (rigour)** | Triangulation<br>Participant verification<br>Referential adequacy<br>Reflexivity | Triangulate data where appropriate (by e-mail)<br>Situate evidence in context;<br>Use overlapping methods;<br>Use verbatim, unedited quotations;<br>Update audit trail |
| **Limitations** | Sample size, phenomenological methods | Chapter 6 |
| **Commensurability check** | Ongoing throughout | Coherence and alignment |
| **Ethical compliance** | Voluntary participation<br>Anonymity<br>Confidentiality<br>Non-traceability<br>*Extra*: ethics of using photographs vis-à-vis anonymity<br>*Extra*: ethics of having own husband as a participant<br>*Extra*: ethics of non-disabled researcher researching disabled | Advance details of topics to be discussed sent before the discussion, filed;<br>Consent forms signed, filed<br>Flash key protection as 'participant n' etc.<br>Photographs requested by email and written consent supplied;<br>Transparency about husband as participant |
| **Presenting written work** | Findings – evidence section (Ch 4);<br>Write as if participants will read the work | Verbatim quotations;<br>Summary of findings emailed to participants at time of submission of thesis |
| **Participants' and researcher's voices** | What stories get told and whose voices are heard | Reflective notes and verbatim speech |
| **Pre-understandings** | Spirit of openness | Reflective notes/text |
| **Alignment check** | 1. Research questions /conclusions/sample/context<br>2. Literature appropriate and critical<br>3. Ontological and epistemological claims<br>4. Theoretical lenses/analysis/conclusions<br>5. Data/conclusions | √ |
| **Accessibility of thesis**<br><br><br>**APPENDIX 4 - (2/2)** | Ethical issue of making thesis accessible to readers with low or no vision. | Alt Text for photographs, tables, arrows and graphics added for readers needing to use screen-readers. Checked by two blind readers met on a screen-reading software forum and one participant |

**Title of Project:  Disabling Barriers – a study investigating access and barriers to people who have a mobility impairment and who use digital technologies at work.**

**Researcher**: Ruth Topol                    email:        Date:

--------------------------------------------------------------------------------------------------------

Dear

I would like to invite you to take part in my thesis research with the Centre for Technology Enhanced Learning in the Department of Educational Research at the University of Lancaster.

**My research aims to find out about the barriers and enabling features of digital technologies in your workplace practices.**

Before you decide if you wish to take part I need to explain why the research is being done and what it would involve for you.

Please take time to read the following information carefully before you decide whether to take part or not. Please email me if you need further clarification or more information . This document includes:

- Information about the purpose of the study (what I hope to find out).

- Information about what participation means and how to withdraw when and if you wish (what you will be doing).

- Details of what notes and recordings may be used as 'data' in the study, how it will be stored and (how I will use the information).

**The purpose of the study**

This research is for my thesis for the PhD in Technology Enhanced Learning programme in the Department of Educational Research at Lancaster University.

My research aims to find out about the barriers and enabling features of digital technologies in the workplace practices of people who self-declare a mobility impairment.

**How do you use these technologies and for what purposes?** So, are there physical or other barriers for you and are there things that act as enablers to you, through your use of digital technologies (adaptive or other) in your working practices?

The benefit of this type of research is hopefully to contribute to an understanding of people's experiences of these barriers by working people who have mobility impairments.

**Why have you been invited?**

You have been invited because I am interested in hearing about the experiences  of people  in paid employment who will be able to shed light on any barriers (physical or attitudinal, for example) which people using digital technologies , may face in the course of  their experiences at work.

1. The research is not about people's physical impairments and *I will not be asking personal questions nor questions about the success, financial or other, of your workplace.  My interest is in your life at work, the technologies in use and barriers*
   **Appendix 5 - (1/3)**

2. *you may face*. Some basic biographical information will be useful for me to get more of a picture of you and your working environment.

3. I am going to be using a 'qualitative' strategy, in which I will use your interpretations of your experiences with technology in your workplace. You will have an opportunity to verify that I have understood correctly what you have told me. *The aim is to gain an understanding of your work situation, rather than to obtain data to turn into statistics*! I will also give you *a* summary of my research findings when complete if you would like them.

4. You also have an opportunity to add to the research design, any topic concerning this project that I may not be aware of or had not thought of. I would very much *welcome* including any thoughts you have on the research process itself.

**Do I have to take part?**

No, your participation is entirely voluntary. If you do not wish to take part, then please let me know. *You can withdraw at any time* during the study and without explanation. Your related data (recordings, notes) can be deleted and all reference removed at any time.

## *What would taking part involve for me?*

## *Format of the chat and your time*

*The format of the chat will be an informal conversation in which you may raise issues of interest which I may be able to include, rather than a list of questions given by me to you.*

*I am particularly interested in hearing if you have a particular incident that you can tell me about, relating to your use of computers that would make an interesting inclusion into my research! So, did something happen with computers or software that enabled your work or promotion or success or communication with customers or clients – or perhaps the opposite?*

**Perhaps something went very wrong with computers or software or perhaps the building didn't have a ramp or lift when you started work? Perhaps colleagues or clients had good or bad attitudes to you?**

*Or have computers made the workplace a more level playing field? Is there any software that has been particularly useful to you perhaps? Give it some thought ... I am very eager to hear your interesting story!*

**Do you perhaps work flexible hours or do you do some work or all work from home, networked to others? Have you adapted any practices in your workplace to suit your particular situation?**

*An hour or two at the very most of your time would be absolutely great for such a conversation.* **If possible, I'd like a demonstration of how you use your digital technologies.** *Your own ideas are very welcome! Of course I have some questions, but if you think of other related ideas – great! You may well think of possible topics you consider that I should include in my research. If I need to clarify my understanding of your interpretations, I would do so by email or by telephone.*

**What will I have to do?**

We will need to arrange a time and place for the discussion. I would then ask you to sign a consent form, allowing me to get information from you and then using it for my thesis and guaranteeing the ethical use of any information you give me.     **Appendix 5  (2/3)**

**Protecting your data and identity - what will happen to the data?**

I will protect your anonymity and confidentiality at all times.  This is not only in accordance with the rules of my university, but I am committed to being an ethical researcher in every respect.

Audio recordings will be transferred and stored on an encrypted USB key to be kept safely until the data is deleted.  You can request to hear the audio recordings as well. Data you give me will be deleted from the audio recorder once transferred to the encrypted key.  I am planning to use information you give me in two ways in my thesis:  (1) I might use your words as direct quotes, using a pseudonym, thus protecting your anonymity and (2) I plan to look for common themes in participants' data and then group these e.g. 'accessibility to technology' or 'training given on technology', if those themes arise, then arrive at conclusions which will be my interpretation of the data. I will check with you that I have understood what you mean so that I correctly represent what is told to me.

Any emails you send me will be non-traceable to you if I should use them.

*You have the right to request this data is destroyed at any time during the study as well as having full protection via the UK Data Protection Act.* The completion of this study is estimated to be by July 2015.

A pseudonym will be given to protect your identity in the research report and any identifying information about you will be removed from the report. You may choose your own pseudonym if you like.

**Who to contact for further information or with any concerns**

If you would like further information on this project, the programme within which the research is being conducted or have any concerns about the project, participation or my conduct as a researcher  please contact:

*Supervisor*:

*Head of programme*:

I am very much looking forward to your participation in the research project.

many thanks            ,

Ruth Topol

I am really looking forward to meeting you and seeing how you use technology!

**Appendix 5 (3/3)**

## APPENDIX 6 - (1/2)  INITIAL CONTACT E-MAIL

# RE: my research

From:
Sent:  22 January 2015 16:34:26
To:

Hi Ruth,

Hope all's well.  I've had a read of this and am very happy to be involved in your research.  What are the next steps?

Best wishes

---

**From:** ı
**Sent:** 15 January 2015 6:43 AM
**To:** Ruth T
**Subject:** Re: my research

Lovely, thank you. I'm not always that quick I'm afraid, but your timing was excellent!

Best wishes

Dave

On 14 Jan 2015, at 18:54, "Ruth T"

> Wow!      that was quick!
>
> here's a bit of info for you to consider.
>
> thanks
>
> regards,
>
> ruth
>
> ---
>
> From: _____  .
> To:
>
> Subject: Re: my research
> Date: Wed, 14 Jan 2015 18:41:12 +0000

Hi Ruth

Thanks for your email; your research sounds very interesting. Please could you send me an info pack and once I've had a look I'll get back in touch?

Best wishes

On 14 Jan 2015, at 18:37, "Ruth T"                                    wrote:

Hello

I've been given your details by your colleague          whom I made contact with yesterday over my research.

          suggested that you might be interested in talking to me.

*I'm researching adults using computers at work, who are also wheelchair users.*

If this is something that might interest you to discuss with me, I would come and see you and if you could spend an hour or so with me, that would be *great.*

I do not ask personal questions:  my interest is in your use of technology in the course of your work. Ideally a demo would be perfect, too!

My interest in the topic has come about as I'm married to a wheelchair user (childhood polio) and we've been discussing these issues for years.

          if this is something you'd consider, I'll send you an info. pack  by email with more details.

I'm a PhD student at Lancaster, but live in Nottingham. I'm a 'mature' student by the way!

thanks

kind regards,

Ruth Topol

<Ruth Topol participant information sheet                14.1.15.pdf>

# APPENDIX 6 – (2/2)  Initial contact e-mail

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**APPENDIX 7 – FURTHER CORRESPONDENCE WITH PARTICIPANTS**

From: ███████ To

Subject: RE: cost of computers and internet for disabled people Date: Fri, 31 Jul 2015

To be honest, the greater the level of impairment I've experienced, the more innovative I have had to become. Perhaps, it has actually helped my kids in lots of ways too, as both of them have used very innovative mechanisms to get where they want to be.

After all, if you have to achieve a goal, it doesn't really matter how you get there... as long as you get there in the end!

Kindest regards,

██

------------------------------------------------------------------------------------------------------

From: ███████ To:

Subject: RE: My research - again! Date: Mon, 5 Oct 2015

Hi Ruth,

Lovely to hear from you and hope you are also well.

It's a good question about having things within reach – it makes a huge difference.

Because it so much easier to be manoeuvrable as an able bodied person, it's not something I'd really thought about before, but for any activities I try and make sure I have everything I need before I start because it can be awkward and time consuming having to go back for something.

So, if I'm cooking I'll get out everything I need before I start and have it all within fairly easy reach, and my kitchen is set out to support this. In the car, my passenger seat becomes a space for my stuff and likewise when I'm working, it's great to have everything nearby. For example, my printer at home is beside my desk, whereas her in the office it's on the other side of the building and so I have to go and fetch everything. Which just takes that little bit longer than if I could walk or had the printer next to me.

As I write this, I have my laptop, printer, two mobile phones and a landline, two memory sticks and a pile of paperwork within arms reach. Which is no doubt the same as an able bodied person, the difference is simply that it's more efficient and productive for me not to have to move around too much when I'm working, cooking etc.

Hope that helps!

Best wishes

██

The magic will begin. I'll be 2 seconds. You can hear it... just let me get it to talk to you...... #01:33:57-6#

R: what can you see without the software? #01:33:57-6#

I can't read text. I can just see blue , lots of colours at the top, white with black things on! (laughs)  #01:33:58-9#

So we have codes. Kirstie knows that if she sends me a text and there is no-one here to read it, she gets 2 kisses back and she has to ring me! (laughs) #01:34:08-9# That's how we do that!  #01:34:11-6#

So this is the magic of Jaws. This is the screen-reader I was telling you about that just talks you. ..... (waiting for it to load, some chatting)....takes a while to set up ... it's a lot to log in .... so we've got sound, but not Jaws ..... ( a bit more waiting). I know he's there...is it doing something in the background? Is it collecting emails or something? (Jaws for windows ready voice comes on!) Hello!  #01:35:50-4#

So this is just Jaws talking. I'll turn it off. So the advantage to Jaws is that it tells you EVERYTHING that is going on so it told me ....(???) So I have it on quite a fast speed [yes, far too fast for me!] but for example, say i was to open a document, the speed at which Jaws can read, so I go onto the Internet, for example (Jaws speaks again)... .it should start reading in a second.... talk to me! talk to me! (Jaws speaks). So, can you hear, (R: yes) search, edit, type or text, so that I know that is the search button Jaws speaks again) . To activate, press space bar. (Jaws speaks) your husband might want to know about this...there's an employment allowance for up to £2000 off class 1 NICs from April 2014. (laughs) (Jaws speaking very fast) . #01:37:17-9#

R: he should know about it because he's an accountant! (K laughs) #01:37:17-9#

(Jaws speaking very fast.) So you see, I can just find my way around ... so that's it on it's own. Now we've got the magic one:  #01:37:30-3#

Now what it's doing this, is that it's actually saying all these things through here .... so I'm hearing (through headphones) what it's saying ... so I have to .... (getting it going for the demo).  #01:38:31-1#

This is the new laptop so it's got next to nothing on it but it runs on new software! As soon as it's all loaded up it should tell me , that's what I'm waiting for. it's saying,' loading, loading, loading.'  #01:39:03-1#

**APPENDIX 9 - PHASE II AND III - DATA ANALYSIS**

| SELECTIONS OF TEXT - PHASE II<br>*Histopathologist. Mid-40s. Married, woman, 2 kids. Medical degree. (Participant 1)* | CATEGORIES –<br>PHASE III | Record | Comments |
|---|---|---|---|
| My boss' attitude was well, I should just ask people to open the doors and I was having shoulder problems with opening these heavy doors I had to quote the legislation in order to get it sorted. It was very, very difficult to get sorted. We then fought [to get it sorted]. | Boss' attitude<br>Legislation<br>Fighting for one's rights | 1a<br>1b | |
| I think he meant well, my boss, but it was a very sort of patronising attitude. Sort-of him deciding what I could do rather than me being independent and deciding what I could do for myself. | Boss' attitude | 1c | |
| I didn't want to retire on ill health. I wanted to still contribute to society and still to work and to support my family with 3 teenagers and them wanting to go to university and everything. I had to really fight (not to accede to boss' suggestion to reduce hours to 12 a week). | Contribute to society<br>Fighting for one's rights | 1d | |
| I really felt a nuisance and I was actually told that money was having to be diverted from other projects to sort the doors out. I felt a pain at the time, and a nuisance, but now I feel I'm showing my worth. | Showing her worth<br>Boss' attitude | 1e | |
| They gave me that laptop. It's one of the things I asked for, which was refused to start off with. So I've got that laptop – but the laptop's very heavy so I need somebody to take it home. Some of the time, I work from home. | Affordances – negative and positive | 1f | |
| Most of the time I do my work with this [microscope]. And it's got an automatic stage like a joystick. Access to Work funded that. And then I have a headset and we use voice recognition. | Use of technology<br>Access to Work | 1g | see photos |
| We have an 11 o'clock meeting every day. We call it a 'huddle'. It's sort of whatever's happening in the day that we need to know about. And how we're doing. | Shared understandings in CoPs | 1f | practices |

## APPENDIX 10 – Phase IV DATA ANALYSIS

# APPENDIX 11 ALT TEXT – EXAMPLE 1

# APPENDIX 11 ALT TEXT – EXAMPLE 2