WALKPLACE: ON AFFORDANCES FOR MOBILITY EXPERIENCES IN THE INDOOR ENVIRONMENT

by

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Above all, do not lose your desire to walk. Everyday, I walk myself into a state of well-being and walk away from every illness. I have walked myself into my best thoughts, and I know of no thought so burdensome that one cannot walk away from it. But by sitting still, and the more one sits still, the closer one comes to feeling ill. Thus if one just keeps on walking, everything will be all right.

— Søren Kierkegaard

Abstract

WALKPLACE: ON AFFORDANCES FOR MOBILITY EXPERIENCES IN BUILT ENVIRONMENT

by

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Walking is among the most common yet important human activities. Encouraging physical activity, particularly walking, has become an objective for promoting public health. In terms of environmental design, research has focused on walkability, that is, the extent to which the built environment supports and encourages walking through its physical features. Although people in modern western societies spend approximately 80 percent of their time inside buildings, most research on the promotion of walking is conducted in urban settings. Meanwhile, research on human movement in indoor settings has mostly focused on wayfinding and its cognitive and behavioral aspects. Wayfinding as a topic has also become dominant in the discourse on movement in environmental psychology while generating few design applications. I argue that while navigation and wayfinding are everyday activities, they are not necessarily nor the only ways that people move around environments and that an empirical focus on only these aspects of movement limits design possibilities.

This study addresses the aforementioned limitations by identifying environmental qualities (i.e., affordances) that influence the everyday experience of movement in indoor architectural settings. I employ triangulated methods drawing on phenomenologically

oriented ethnographies, space syntax, and participatory design. The group of study participants (n=24 for the ethnography, and n=9 for the participatory design) were selected to include a very diverse group of users to allow for identifying a multiplicity of experiences. The study sites included three buildings located at one university campus representing three very different architectural styles with each designed and built in a different decade and an additional building that was being designed and later constructed at the time of data collection.

The findings of affordances coupled with mobility experiences presented in this dissertation are translated into patterns for mobility design. Moreover, I put the findings in the broader context of the environmental psychology, in particular the theory of environmental preference and learned helplessness. My work contributes to the theories of place as well as providing critical assessment of the methods used.

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Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

Introduction

Walking is among the most common yet important physical activity and getting enough physical activity is as – if not more – important for our health as our diet and other lifestyle factors (US Surgeon General's report on physical activity after Giles-Corti and Donovan, 2003; p. 1583). In fact, getting physical activity has been shown to decrease risk for various types of cancer (Monninkhof et al.; 2007; Thune et al., 1997; Whittemore et al., 1995) and heart disease (Warren et al, 2010). Research has shown that a sedentary lifestyle (sitting for over 6 hours a day) lasting for over a decade can shorten your life expectancy by 7 years (Brønnum-Hansen et al., 2007; Katzmarzyk and Lee, 2012). These findings set clear goals for environment-behavior studies and environmental design: understanding how the physical environment influences our walking and designing to support this kind of activity.

Indeed, the environmental design community has taken up the topic of design for walking in recent years as researchers started studying the so called 'walkability' of neighborhoods or different environmental qualities that promote walking (Brown et al., 2007; Gina et al., 2008; Southworth, 2005). I examine this body of literature more closely in Chapter 2. The growing interest in the topic of walkability has been particularly evident at the recent Environmental Design Research Association (EDRA) conference where a number of presenters examined health, which was the main topic of the conference, through the lens of the physical qualities of urban space that promote walking in urban areas.

However, as important as the topic of outdoor urban health is, the reality is that we spend most of our time not in public space but inside buildings (86.9% to be precise according to the National Human Activity Pattern Survey Klepeis et al., 1996) and, yet, most of the academic research on walking and physical environment is conducted in outdoor urban settings[1].

[1] With the few exceptions that I examine more closely in Chapter 2.

The awareness of the importance of design for walking is slowly increasing among practitioners and this, in turn, gets reflected in design guidelines. Recent Active Design Guidelines (2010) promoting physical activity and health in design (2010), published by the New York City Departments of Design and Construction (DDC), Health and Mental Hygiene, Transportation (DOT), and City Planning provides guidelines on creating 'an active city' as well as recommendations for building designs that can create opportunities for physical activity indoors. The authors, for example, list detailed suggestions for stair design and mention other design features that can have effect on how and where we walk:

> [F]eatures such as unneeded escalators, an overemphasis on elevators, and barriers like door locks, grade changes, non-ergonomic design, and poor placement of building elements can deter physical activity (p. 68).

Such environmental features that in some way influence walking indoors are the main interest of this study. However, I am not interested in quantifying and measuring their effect on the amount of walking we do. Rather, because there is little research literature that actually defines these features, I am therefore interested in exploring and identifying a pool of possible design qualities that affect our walking indoors.

On a general level, health benefits that walking as a physical activity leads to are undoubtedly the reason why this study would be of importance not only for the design profession but for the user as well. Although this research topic was not initially dictated by my interest in health, it was inspired by my personal experience, and the experience of many others, of spending most of my work and leisure time passively sitting. I was also interested in examining the little annoyances that I encountered while moving through my everyday environment and wanted to explore how the design of indoor environments could influence our experiences of walking.

This study is rooted in my previous research project. In a study I conducted in 2007, I compared wayfinding behavior in real and virtual environments (Skorupka, 2008). The

task of finding one's way to an elevator was followed by think aloud protocols in which the participants described their experiences while watching the videos of themselves going through the space and doing the task. One participant noted:

> 'I didn't think about it but now that you are asking me the question, I think when you see glass door or ... I think it is like, you are welcomed to go through and if the door is solid it' s like...it's a private place or office'.

This and other comments from study participants pointed to a whole array of experiences they literally went through as they were walking through the spaces. Consequently, this study examines these experiences 'on the go' and aims at identifying the environmental features of architectural settings that afford them.

This dissertation follows a research paper format common in social sciences. First I walk the reader through a literature review to reveal that there is, in fact, little work on specific design features that influence our experiences of mobility inside buildings. While showing the missing links, I also point out to the methodological approaches that have been successful at identifying these design features. In this sense, Chapter 2 sets out the grounds for the choice of methodologies for this research project. The next chapter problematizes the topic of affordances for mobility by deconstructing the research question and setting it in a broader theoretical context. I then proceed to describe the research design. As the three theoretical frameworks of choice and their corresponding methodological approaches are heterogeneous, I am presenting them – along with their specific methods and findings – each in a separate chapter. Chapter 4 is devoted to the inquiry of configurational affordances for indoor mobility through Space Syntax. In Chapter 5, I identify further affordances through phenomenologically oriented ethnographic study and in Chapter 6, I employ Participatory Design as a research methodology to complement the repertoire of affordances already identified. The final chapter discusses the findings of these approaches

on three dimensions: applied, methodological, and theoretical emphasizing this study's shortcomings and possible implications for future research.

Chapter 2

Repertoire of affordances for walking: literature review

Repertoire of affordances for movement: literature review

Review of both the design and research literature reveals that there is, in fact, very little work published on the physical qualities of the environment that influence our movement within architectural spaces. In this chapter, I investigate the relevant literature in detail. Cognitively oriented research on movement proves to be rich in insights on how people navigate through built environments but offers few design applications. Some argue that it is because the cognitive approach tends to focus on the mental representations of environments and not the environments themselves. In contrast, walkability studies and Space Syntax are the two approaches that focus on the physical qualities of the environment. Walkability research has, so far, been solely conducted in urban settings – identifying the physical qualities of outdoor environments that contribute to more walking. On the other hand, the Space syntax tradition (which is introduced in this chapter and later described in more detail in Chapter 3) looks at both indoor and outdoor environments. But, in studying how the physical environment influences human movement, it takes into account only one, very specific feature, namely spatial configuration. I also discuss research grounded in phenomenology which provides insights on mobility experiences but offers few design implications. This chapter concludes with a brief reference to critical theory as an additional lens to be considered when studying mobility.

Cognitively oriented research: wayfinding and spatial representations

There is a good deal of research on *how* we move through built environments and, in particular, how we navigate and find our way through them. Social science and especially cognitively oriented environmental social science, has addressed the issue of human navigation and wayfinding in particular through the lenses of different disciplines. In particular, both psychology and geography have provided insights into the cognitive processes directing decisions made by people as they find their way though their

environments (Golledge, 1999; Neisser, 1976), how they are influenced by individual differences (Galea and Kimura, 1993), and strategies that are employed to find one's way in an environment (Hölscher et al., 2006; Lawton, 1996). We now also know more about the development of spatial cognition (Hart and Moore, 1976) and route and spatial learning (Golledge et al., 1995).

Preoccupation of cognitive approaches to wayfinding

Interestingly, most researchers with a cognitive orientation choose to focus on wayfinding rather than any other form of human movement. Perhaps, this is not surprising given that wayfinding is a decision making process for choosing a spatial route. But, while it apparently constitutes an important topic of interest for cognitively oriented scientists, wayfinding has also become predominant in the discourse on human movement in environmental psychology (Bechtel and Churchman in their *Handbook of Environmental Psychology* devote a whole chapter solely to wayfinding and a 2011 search in the *Journal of Environmental Psychology* shows 43 articles on wayfinding and only 7 on walking). Navigation and wayfinding are undoubtedly a part of our life but it is not necessarily the only nor the dominant way we move around the environment in our everyday life. I would actually argue that most of the movement that takes place in buildings is, in fact, very different from wayfinding and that there is a need to expand the research scope into everyday walking in indoor architectural spaces to include more routine movements in the known or semi-known environments that encounter every day. However, cognitively oriented research on human spatial movement does not take up this challenge.

Research on cognitive maps has not translated to design applications

Both "wayfinders" from the cognitive psychology team and other non-cognitively oriented researchers have studied human movement with an underlying assumption that the environment is represented in the form of cognitive maps and that we act upon these representations. The term itself was introduced by Tolman (1948) to describe the spatial knowledge rats acquired about a maze in which they were moving. Since then, the term has been very successful in an array of disciplines (despite some strong opposition against the concept – see for example, Ingold, 2000). Geographers and urban planners have examined how we construct and use cognitive maps (Downs and Stea, 1973, 1977; Lynch, 1960) and cognitive psychologists have looked at what role cognitive maps play in processing spatial information, orientation, and for spatial behavior in general (Freundschuh and Kitchin, 2000; Golledge, 1999).

Just as the application of behavioral research to design has been indicated as one of the general goals set out by the founders of environmental design research (see e.g. Winkel, 1969), cognitive mapping research aimed for design applicability. The assumption was that research on cognitive mapping could translate into better design of orientation tools, such as maps for example, as well as the environment itself.

In 1986, Holahan in his environmental psychology review noted that the main problem with applied cognitive mapping work – that is one that could be applied to actual design – was that *there* [was] *very little of it* (Holahan, 1986, p. 392). In 1998, Jackson and Kitchin noted that *the projected practical applications of cognitive mapping research have largely failed to materialize* (p.219).

Interestingly, there is a considerable amount of work within the graphic design discipline on wayfinding aids (see, for example: Calori, 2007; Mollerup, 2005). However, more often than not, the "design for wayfinding" guidelines are not grounded in research but rather in the experience and "expertise" of the designers themselves. The work of

Arthur and Passini is an exception, (Arthur & Passini, 1992; Passini, 1977, 1984) as they ground the design guidelines for wayfinding guides in understanding of (and research on) human orientation processes. What is more, their work embraces the multiplicity of environmental dimensions by expanding the (usual) focus of graphic sign design into the spatial planning, architectural wayfinding communication, and audible and tactile design for wayfinding.

Why is it then that, except for the seminal work of Arthur and Passini, research utilizing the concept of cognitive maps has not very successfully translated to design applications? There are many reasons identified by the cognitive mapping community itself but, the one argument that is perhaps most interesting, comes from those researchers who oppose the concept of the cognitive map. As Ingold (2011) and Heft (1996) argue, there has been a preoccupation of cognitively oriented research on human movement with mental representations of the environment i.e. cognitive maps and not the environment itself. Heft points this out based on Wohlwill's (1973) the *Environment is not in the head* argument (Heft, 1996, p. 285). While it is not my intention to dispute the findings from the literature within the cognitive mapping tradition, nor to negate the fact that we do create mental representations of the environment, rather my intent is to shift the focus from the mind to the environment itself; conceptualizing movement as an experience taking place in an actual physical environment.

Finally, the lack of applicability of cognitive mapping research should be put in a broader context of environmental design research. Some argue that the discipline has not fully faced this challenge set out by the founders. Sanoff (2000), in particular, has argued that environmental design research has not been successful in facilitating collaboration among researchers, designers, and planners because it separates research and design. He argues for participatory design as an alternative approach that could help overcome this shortcoming since it does not imply the separation. I develop this suggestion in my methodology.

Walkability and Space Syntax: affording where we walk in urban environments

Walkability. Shifting the focus from mental representations to the environment itself in research on spatial mobility is well exemplified by research from two domains, namely research on walkability and research from within the Space Syntax tradition.

Walkability is rarely defined even by researchers who study it. In general, the term describes environments that are walk-able or, in other words, walking friendly. Southworth (2005) provides the following definition: "*walkability is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network"* (p. 248).

Three meta-reviews of walkability studies (Owen et al., 2004; Saelens et al., 2003; Saelens and Handy, 2008) shed some light on the factors that correlate with more walkable places. Proximity and the accessibility of spaces turn out to be mostly associated with more walking in them. Connectivity is another factor (closely related with the latter two) that correlated with more walking. The reviews also reveal that mixed land use, density, aesthetics, pedestrian infrastructure, and neighborhood type are crucial for increasing walking. Aesthetics, although somewhat problematic due to lack of unified measures, turned out to be a very interesting feature as it mostly associated with walking for pleasure and not walking for transportation (getting from and to places). All these attributes correlate with walking meaning that, when they are present in a particular urban environment, more walking takes place. However, it should be noted that most walkability studies are correlational. Thus, there is often little ground to point to a causal connection between environmental attributes and walking. For example, while proximity might be an affordance for walking, it may actually be the amount of walking that takes place in a particular urban environment that invites mixed-use planning and thus availability and proximity of potential goals (shops, services etc.). Further research is needed to investigate

if these indeed are affordances that cause more walking. However, as walkability is an important current topic, further research is probably on its way. It is interesting to note the increasing focus of research on the walkability of urban environments especially in the past decade. However, given that we spend almost 90% of our time indoors (after National Human Activity Pattern Survey), it is somewhat surprising that walkability is predominantly, if not exclusively, a topic of interest for those studying outdoor urban environments. I would like to argue that, exactly because of this disproportionality, greater emphasis should be placed on researching walking that takes place in indoor settings.

Space Syntax. Research from the Space Syntax tradition is another example of shifting the focus from mental representations of the environment to the environment itself in research on spatial mobility as it is an approach that stresses the role of the environment in human movement (and vice versa). Its theoretical basis emphasizes the mutual and dynamic co-construction of the spatial and the social. In other words, the assumption is that the configuration of space is the generator of walking but also that human movement forms spatial configurations (Hillier et al., 1993). What is more, the theory does not aim to describe our movement in space but more generally, how we inhabit space. As Bafna puts it, "*the central premise within the Space Syntax research program [is] that social structure is inherently spatial and inversely that the configuration of inhabited space has a fundamentally social logic"* (Bafna, 2003; p. 18).

Space Syntax methodology involves a structural analysis of a spatial configuration (layout) quantifying it in terms of visual accessibility (that is, vistas available to users – see for example Haq et al., 2005) and the connectivity and arrangement of its parts such as the depth of nesting spaces. The analysis transforms continuous spatial representations (layouts) into discrete ones (graphs) by assigning them so-called integration values calculated based on their location in the graph (for a more detailed description of the method, See Chapter 4

as well as, for example, Bafna, 2003; Hillier and Hanson, 1984; Peponis and Wineman, 2002; Zeisel, 2006). Space syntax measures have been linked to path choices (or, in other words, predicting – to some extent – where people walk) and other phenomena such as crime, congestion, and pollution (Chiaradia et al., 2000; Hillier, 2004; Penn and Croxford, 1997). Because the vast body of literature from within the Space Syntax tradition has shown that configuration of space is, in fact, an affordance for human mobility, both in urban and architectural settings, their methodology and methods will inform this dissertation. I discuss this topic further in Chapter 4.

Patterns of flow: affordances that influence how we walk in urban environments

Both walkability studies and the Space Syntax tradition focus on *where* we walk and how environmental design can contribute to more walking in urban environments. There has also been substantial research on *how* we walk in cities. How – meaning what environmental features make us slow down or speed up, where we stop, or which way we tend to turn as we enter a crossroad.

One of the first series of studies about how people walk in urban spaces was conducted by Pushkarev and Zupan (1975). Their most significant contribution was to use aerial photography to study pedestrian behavior in the city. But the real research revolution in studying walking in the city came with William Whyte and his studies of public spaces in early 1980s (1979, 1980, 1988/2009). Whyte's main objective was to identify successful public spaces and, although he was not specifically focused on walking, his findings tell us a lot about how people move in the city. They are too rich to fully summarize in this chapter so I will only refer to a few of his interesting findings.

According to Whyte (1988/2009), pedestrians usually take the shortest route. As obvious as this observation sounds, it still has not been incorporated into urban design practice. He also observed that men walk faster than women, groups are slower than

individuals and pedestrians in big cities walk faster than people in smaller cities. A pedestrian usually walks not directly behind someone else but slightly to his or her side. Some of Whyte's observations were also related to the physical qualities of the urban environment and how they influence walking. His findings show, for example, that street corners afford people to stop and have conversations more than other parts of the street, that interesting window displays afford slowing down while mundane façades, like those of a bank, make pedestrians speed up. At the time of Whyte's studies in New York, Jan Gehl and his colleagues (1987) conducted similar research in Copenhagen and, to this day, these types of urban space quality studies are used to examine use, and provide design recommendations creating successful public spaces around the world.

William Whyte's student, Paco Underhill, has successfully used the methodology of tracking pedestrians and time lapse filming to study people's behavior while shopping. And, while his research is focused on very specific types of interiors--oriented to selling merchandise – a number of his findings on how people move are universal and can be generalized to other types of settings. Underhill (2003) observed, for example, that people usually slow down while entering a building; or what we in environmental psychology could phrase as the way that entrances *afford* slowing down. Reflective surfaces that pedestrians pass yield a similar effect making them slow down (presumably to see one's reflection). Underhill also confirmed for interiors what Whyte observed in public spaces; namely that people (and in particular those who are right handed) have a tendency to turn to the right. Another interesting spatial affordance is what Underhill calls "the butt brush effect": narrow shopping spaces force people to "brush" each other or jostle other people's backs when passing. Shoppers don't like this and, thus, it has an effect which causes people to move from these spaces – which, in turn, affects their shopping patterns (Underhill, 2003).

The dance metaphor: Ballet and Notations

Many researchers studying movement refer to the metaphor of dance. Perhaps the first to do so, and definitely one who has used this metaphor with a great success, was Jane Jacobs in her seminal work "The death and life of great American cities":

> This order is all composed of movement and change and, although it is life, not art, we may fancifully call it the art form of the city and liken it to the dance — not to a simple-minded precision dance with everyone kicking up at the same time, twirling in unison and bowing off en masse but to an intricate ballet in which the individual dancers and ensembles all have distinctive parts which miraculously reinforce each other and compose an orderly whole (Jacobs, 1961/1992; p. 50).

Jacobs goes on to describe the unchoreographed yet precise sidewalk ballet of Hudson Street in Manhattan. Whyte (1988/2009) uses the same metaphor when describing the moves of sidewalk salesmen. A similar thought is present in Lefebvre's work (2004) in which he compares rhythms to the music of the city. Jan Gehl takes this metaphor a step further. A good city "*...is like a good party: people don't want to leave early"* says Gehl (2010).

How can this metaphor be used in studying spatial mobility in more detail? A closer look at how dance is studied reveals a number of notations or elaborated systems of symbols used to describe dance sequences. Perhaps the most noteworthy notation system is Labanotation by Rudolf von Laban in dance (after Cresswell, 2006). To make sense of movement, he saw it as necessary to first "*produce a form of notation that could account for the universe of bodily movements"* (ibid., p.126). While simultaneously interested in reducing bodily movement to a sort of abstract code as Cresswell points out, Laban's work underlines the role of gender and politics that get reproduced in bodily mobility. This is particularly visible in Laban's later book (1974) on notations of mobility within a workplace. However, his notation system has not addressed the environment as a setting of movement at all. About the same time as Laban developed his notation, the landscape architect Lawrence Halprin (1965) developed a parallel notation system called Motation with more emphasis on the

environment and with the explicit assumption that the notation system would be used for design for movement. A somewhat similar two-fold notation system for both the experiences of movement and the environment was developed by Philip Thiel (1963, 1997). A detailed review of these notation systems has been provided by Talwar (1972) and is beyond the scope of this thesis. What is significant in the context of this research project is that, though very promising, these notation systems for movement have not been developed to yield applicable results for architectural design over the past decades. As Talwar pointed out, "*the environmental characteristics [...] would then require several sheets of superimposed notations on plans. This becomes a lengthy process and may defeat the simplicity goal"* (ibid., p. 68). Recently, some researchers in the Human Computer Interaction (HCI) field have used notation systems to describe people's interactions with technology (Loke et al., 2005). I will similarly make use of some the notations' categories in coding the ethnographic data (see Chapter 5) though notation will not be a main method in this project.

One finds a different take on the "mobility as ballet" metaphor in David Seamon's work. Seamon, opposing the cognitive preoccupation in studying movement and mobility, builds on Merleau-Ponty's (1962) phenomenological approach to conceptualize bodily behaviors as either "*body ballets* or *time space routines. Body ballet is a set of integrated gestures and movements which sustain a particular task or aim"* (Seamon, 1979; p. 54). It could be, for example, movements that one makes while doing dishes. Movements become a body ballet as they are more trained and require less cognitive engagement. Time-space routines on the other hand are, *"set[s] of habitual bodily behaviours which extend through a considerable portion of time"* [ibid., p. 55]. These can be our daily routines that our days *unfold* through, to use Seamon's wording. An important component of these experiences is that they are habitual and mostly occur without reflection. For a number of people sharing the same space, *body ballets* and *time space routines* together become *a place ballet*. Building on Edward Relph's (1976) concept of place, Seamon identifies qualities that design should aim for to support a place

ballet, namely: *attraction, diversity, comfortableness, invitation, distinctiveness, and attachment*. I examine these environmental qualities in more detail in Chapter 5.

Critical theory: Practices. Production and management of mobility

Critical to the question of affordances for different experiences of walking in physical environment is the concept of power and the production of mobility. The concept of 'production' was developed by Marx (1867/1967) to describe the socio-economic workings of a political system (and, in particular, capitalism) and its forces and modes. In other words, Marx looked at how the political system, through its modes of production, creates economic and social reality. Lefebvre builds on Marxist theory, taking a Marxist lens on the social production of space asserting that *(social) space is a (social) product* (1999, p. 26) and that the focus of theoretical examination should be on the processes of social production of space. Cresswell (2006; 2008) along with Uteng and Urry (2007) build on Marx's and Lefebvre's work and assert further that mobility is also a social product. Therefore, they argue, mobility should be examined in the socio-economic context that produces the way we walk. Both Cresswell and Urry provide an extensive account of critical theory on human mobility. Let me focus here only on those theories that directly touch upon affordances that may influence the experience of walking.

For Michel De Certeau (1984), urban space could be oppressive, imposing order and movement through its configuration and rules and regulations. De Certeau conceptualized walking as the politics of resistance that constitutes the city (Urry, p. 71); spatial tactics – or the ways in which we move around – are, to some degree, independent of the impositions of the space. What is more, these tactics actually have the capability to change the existing space. In a way, these two are intertwined – the designed and built space influences our walking practices but, reciprocally, the practices may change the space. One of the examples

that can exemplify this idea are the paths that people make while taking shortcuts. Very often such "illegal" paths get paved and become "legitimate".

A key concept when discussing the critical social theory of mobility is the flâneur:

> The flâneur was the modern hero, able to travel, to arrive, to gaze, to move on, to be anonymous [...] in other words to be in public and moving about in the city's paved, public spaces among strangers (Urry, 2007; p. 69).

The flâneur, as conceptualized by Tester (1994), Benjamin (1982/1999), and others was a male strolling though the commodified urban spaces, observing and "*passing the hours by shopping or window-shopping, looking at books, new fashions, hats, combs, jewelry and novelties of all kinds*' (Wilson, 1992 ; p. 94). It was the socio-economic context of capitalism that produced both the flâneur and the commodified spaces he strolled through. What is more, as the physical space reproduced power relations, it was regulating the very gendered use of both public and private space (for more on gender and the flâneur see: Munt, 1995; Wilson, 1992).

If we were to position the concept of affordance within this analysis, it would be the commodified spaces (like Walter Benjamin's arcades and paved streets) affording the above-mentioned uses by the flâneur. Taking the gender critique of the concept, this conceptualization of a wanderer would apply not only to a (white) male but also to people at other intersectionalities of gender and race. Another good contemporary example of what I would want to call power-affordances is provided by Cresswell in his chapter on *Production of Mobilities at Shiphol Airport, Amsterdam*.

What all these examples emphasize is that, just as mobility (contrary to movement in an abstract space) takes place within a socio-cultural context, the analysis of mobility and the physical space in which it happens has to take into account power.

Summary: recommendations from the literature review for this research project

This review leads me to some general implications for this research and highlights approaches that have been successful at studying movement in built environments that I wish to build on in this dissertation.

The first conclusion that I take from the review is to expand the research scope to embrace everyday movement in architectural spaces (rather than a solitary focus on wayfinding). Secondly, I will aim to bring human movement and its corresponding environmental qualities into the foreground of research investigation instead of focusing on the person and mental representations of the environment.

This project will build on methodological approaches that the review identified as successful at addressing relationship between the structure of the environment and spatial mobility (Space Syntax methodology) and the experience of mobility at an individual level (the phenomenological tradition). Finally, I will follow Sanoff's recommendation of assuming a research paradigm that does not separate research and design by utilizing participatory design methodology.

Chapter 3

Research question and research design

Research question and research design

Research question and its theoretical context

The review of the literature presented in the previous chapter reveals that not much research (with a few noteworthy exceptions) has been conducted that specifically examines the environmental features that influence the experience of walking in indoor settings. This leads me to the research question that I wish to address in this dissertation:

What are the affordances that influence the everyday experience of mobility in an architectural environment?

The goal of this study is to address an issue that no previous research has examined, namely to identify affordances and the accompanying experiences of mobility. In other words, with this study I do not test a hypothesis but identify the multiplicity of mobility experiences and their accompanying affordances. Before I describe the choice of methodology and the methods for exploring the possible array of affordances and mobility experiences, I first present the theoretical grounding of the concepts to be studied.

Deconstructing the research question

Affordance. The two key concepts of this study are affordance and experience. I understand affordance from the work of James Gibson:

> The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill [...]. I mean by it something that refers to both the environment and the animal in a way that no existing term does (Gibson, 1979; p. 127; emphasis in original).

Affordances are the perceived functional significance of an object, event, or place for an individual. As the functional significance of the environment, they establish possibilities

and limits for actions: a chair is *sittable* so one can sit on it but not necessarily lie on it. Affordances as perceivable properties that are specified in the stimulus information (that is the *optic array,* see Gibson, 1979) and thus are perceived directly (I will return to this later in the section on experience).

Gibson rejects Cartesian dualism, by claiming that affordances are neither purely objective nor purely subjective.

> An important fact about the affordances of the environment is that they are in a sense objective, real, and physical, unlike values and meanings, which are supposed to be subjective, phenomenal, and mental. But, actually, an affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer. (Gibson, 1979, p. 129; after Heft, 2001, p. 125).

Indeed, affordances are properties of an object which would lead to arguing that they are objective, in the world outside of an individual. But they are not just properties; they are potentially perceivable, functional properties. That is, they are considered in relation to an individual and can only be actualized by an individual who perceives them. However, affordances exist whether they are perceived or not by a particular individual. It is the potential functional significance of an object, event, or place for an individual but is not dependent upon the fact that anybody experiences it. In this sense, affordances are both independent and relational.

But, as Heft explains, quoting Gibson in detail, since affordances provide possibilities for actions, they are not merely functional but instead they are *multidimensional* (Heft, 2003; p. 157) also carrying affective and motivational qualities:

> J. J. Gibson (1979) quoted Koffka approvingly: "Each thing says what it is ... a fruit says 'eat me'; water says 'Drink me'; thunder says 'fear me'; and woman says 'Love me'" (p. 138). That is, affective and motivational qualities are intrinsic to affordances. Awareness of affordances typically is an intertwining of knowing, feeling, and acting (Heft, 2003; p. 155).

What is more, as Heft argues, they hold ***meaning*** *for an active perceiver* (Heft, 2001; p. 123: emphasis mine) and, as such, have a phenomenological rooting. In other words, affordances do not only have only a functional but a more holistic, experiential component to them. This is why this study is concerned with affordances for mobility experiences and not just affordances for walking (action).

Experience of the environment. An examination of the literature on movement in built environments reveals (see Chapter 2) that most studies conceptualize movement as having behavioral and perceptual components and often focus on mental representations (cognitive maps) and actions. In this project, I argue against a reductionist conceptualization of movement as behavior and perception and propose a more holistic understanding of movement as experience. I would like to follow the critique presented by Vischer who points out in 'Towards a user-centred theory of the built environment' (2008) that:

> [..] visual perception, auditory perception and sometimes olfactory and even kinaesthetic experience are studied. In doing so we fail to learn about the whole experience, to understand how users experience their environment when they are seeing, hearing, smelling and touching all at once. Efforts to do so are readily condemned as 'subjective' by conventional social science; but as qualitative methods become more sophisticated this may be the best route to understanding the gestalt of the user's environmental experience (Vischer, 2008; p. 235).

My understanding of 'experience' and consequently the whole methodological and theoretical framework for this project draws on a broad scope of perspectives. I build on the classic work of the American pragmatists (in particular: James, 1904) and hermeneutic phenomenologists (Heidegger, 1962; Merleau-Ponty, 1962) as well as more recent work of Harry Heft (1983, 1996, 2001, 2003) and Tim Ingold (2000, 2011).

Heft elaborates on James Gibson's ecological approach by drawing lines between the empirical radicalism of William James and John Dewey and the hermeneutic phenomenology of Maurice Merleau-Ponty and Martin Heidegger. Ingold meets Heft in his anthropological paradigm building on, among others', an ecological approach and phenomenology. For Ingold, experience does not mediate between mind and nature since these are not separated in the first place. It is rather intrinsic to the ongoing process of "*being alive to the world, of the person's total sensory involvement in an environment*" (Ingold, 2001; p.99). This position is identical with that taken by the phenomenologists who see people and their environment as inseparable (see Heidegger, 1962; Grauman, 2002; p. 98). Phenomenologists and, in particular, those adherents of a hermeneutical framework (Merleau-Ponty; 1962), emphasized that the body has an active role in experience. Ingold goes a bit further and, building on the work of Bruno Latour, claims that an organism is not a bounded bodily entity in an environment but rather 'an unbounded entanglement of lines and fluid space' (Ingold, 2011; p. 64).

The central concept in Heft's theoretical framework is 'direct experience' that bridges the work of William James and James Gibson. James originally differentiated between first and second order experience specifying how they differ:

Table 1

Experience order according to William James

first order experience	second order experience
unmediated, immediate and direct	mediated and indirect
minimum awareness	holding portions of immediate experience in awareness
non analytical	analytical
percepts: phenomena of immediate experience	**concepts**: phenomena of reflection or analysis on immediate experience
feelings	reflexivity: indirect acts of cognition such as analysis or categorization
nearly automatic and habitual	non habitual and not automatic
a person is immersed in doing and being	a person is not immersed but steps outside of the flow of immediate experience
knowledge of acquaintance	knowledge about

James argues that we perceive an object or environment through first order experience. Heft reformulates this concept into what he calls, after Gibson's 'direct perception', 'direct experience'. Affordances, argues Heft, are percepts that are experienced directly. Further on, Heft argues that, through immediate experience, a meaning of the object is derived. A meaning of an object as it emerges through direct experience in a particular time and space can be shared between two persons. Meaning, as understood by Gibson and Heft, corresponds with the phenomenological take on it, namely, it is not a phenomena of a person nor a phenomena of an object but rather it *is an intersubjective matter of people-environment relations (*Grauman, 2002, p. 96) just as the world is not separated from human consciousness (Heidegger, 1962, 1971; Merleau-Ponty, 1962).

Second order experience, or "the knowledge is conceptual in type, or forms knowledge 'about' an object. It consists in intermediary experiences (possible, if not actual)

of continuously developing progress, and, finally, of fulfillment, when the sensible percept, which is the object, is reached" (James, 1904; p. 541). Heft explains that this higher order of experience is the knowing of objects and events and their relations in a broader socio-environmental context rather than as affordances that are experienced in the relation to the me-as-a-perceiver (see Heft, 2003; 151). First order experiences provide a base for the knowledge of relations. In the context of these theoretical concepts, a somewhat more practical question remains. Let us say a person is presented with a hallway that affords walking in it but it also affords the feeling of not being inviting or welcoming. When the person stops, and almost literally steps out of her flow of experience to verbalize (and thus reflect) this experience, is she already engaging in the second order of knowing? How to study affordances and their coupled experiences and not only their second order experience? Or how to study the precepts of affordances and not the concepts as products of reflexivity and analysis? In other words, how to study affordances without falling into what James called the psychologist fallacy (see Heft, 2003 and James, 1890).

Heft addresses this question by referring to Dewey's take on the two modes of experience (Heft, personal correspondence, 2013). Similar to the phenomenologists and, in particular, David Seamon, suggest that we engage with the environment on an *awareness continuum* (after Kusenbach, 2003; p. 469) that spans from us being completely merged with the environment to separateness from it. Phenomenology is a methodological approach to study experiences without leading to this separation. I develop the methodological approaches I use to address the research question further in Chapters 4-6.

Mobility. Human movement can be defined as "any spatial displacement of the body or bodily part initiated by the person himself" [sic] (Seamon in Buttimer & Seamon, 1980, p. 148). The type of movement I intend to investigate is walking which could also be

defined making one's way through some space. An example would be moving down a hallway in a workplace to pick up a cup of coffee while stopping by a colleague's office.

Everyday movement needs to be differentiated from the more narrow term 'wayfinding' often used in the literature on movement and usually defined as finding one's way from an origin to a destination (see e.g. Allen, 1999). Wayfinding is a "*purposeful movement to a specific destination that is distal and, thus, cannot be perceived directly by the traveler*" (ibid., p. 47). The goal may be known but the way to reach it is not – thus the phrase "finding the way". Everyday movement may but does not have to include elements of wayfinding.

Furthermore, as briefly noted in Chapter 2, I follow Cresswell's argument in expanding the concept of movement understood as any spatial displacement of the body to incorporate the fact that movement is (at least to some extent) an effect of social production. In other words, it takes place in a socio-cultural context with power relations present though they are not necessarily always apparent (for more on production of mobility see Chapter 2 and Cresswell's chapter on *Production of Mobilities at Shiphol Airport, Amsterdam*.). Cresswell differentiates mobility from movement that happens in an abstract space (ibid., p. 20). I follow this distinction and use *mobility* as the concept of my interest in this dissertation.

Research design

On the choice of methodological approaches to address the research question

To study the affordances that influence the experiences of mobility in an architectural environment, I proposed a combined methodology that employs approaches that have been successful at addressing: 1) the relationship between the structure of the environment and spatial mobility (the Space Syntax methodology) 1) the experience of

mobility at an individual level (the phenomenological tradition) and, 3) the gap between research and design (participatory design). Each methodological approach as well as details of the methods used is described in the corresponding Chapters 3-5. In each of these chapters, I provide a more extensive theoretical grounding for the methodology and position it within the other approaches used in this dissertation. My hope is that triangulating these three seemingly quite different theoretical approaches will provide validity (Camic et al., 2003) to this predominantly qualitative study.

An architectural environment: the choice of case studies.

In this dissertation, I understand architectural environment as indoor environment. When planning the study, I was living in Oslo, Norway and the buildings that I chose for my project were located at the University of Oslo (UiO) campus. I was invited for a research visit with the Design of Information Systems group in the Informatics Department. This presented me with a unique opportunity. At that time, the department occupied three buildings and, in the upcoming years, they were planning to move to a new building which was not yet fully designed but being designed as a new center for the Informatics Department. I decided to choose these four buildings (the three existing ones and the new one) as my case studies – all three used by the Department of Informatics and all are located in close proximity to each other. Being a visiting researcher, I was granted access to all the sites I used and was provided help with the logistics involved in conducting this research (such as work space and contacting potential study participants).

Site 1. The first case was the main building of the Informatics Department. This 4-story building was designed and constructed at the beginning of the 1980s and opened in 1988. It has a total area of 9,497 m^2 (approximately 102,200 sq ft). The building was owned and managed by the UiO.

Figure 1. Building 1.

Site 2. The second site was a building composed of three buildings built consecutively in the 90s . The area encompasses 23,000 m^2 (247,000 sq. ft.). It is managed by a company independent of the university and houses a number of other public and private institutions as well as enterprises.

Figure 2. Building 2.

Site 3. The third building is the smallest (1,941 m^2 or approximately 20,900 sq. ft.) and the oldest (constructed in the 1970s) of the sites studied; it has 6 floors and has been managed by the UiO. The Department of Informatics rented two out of the six floors sharing the building with other research groups and institutions.

Figure 3. Building 3.

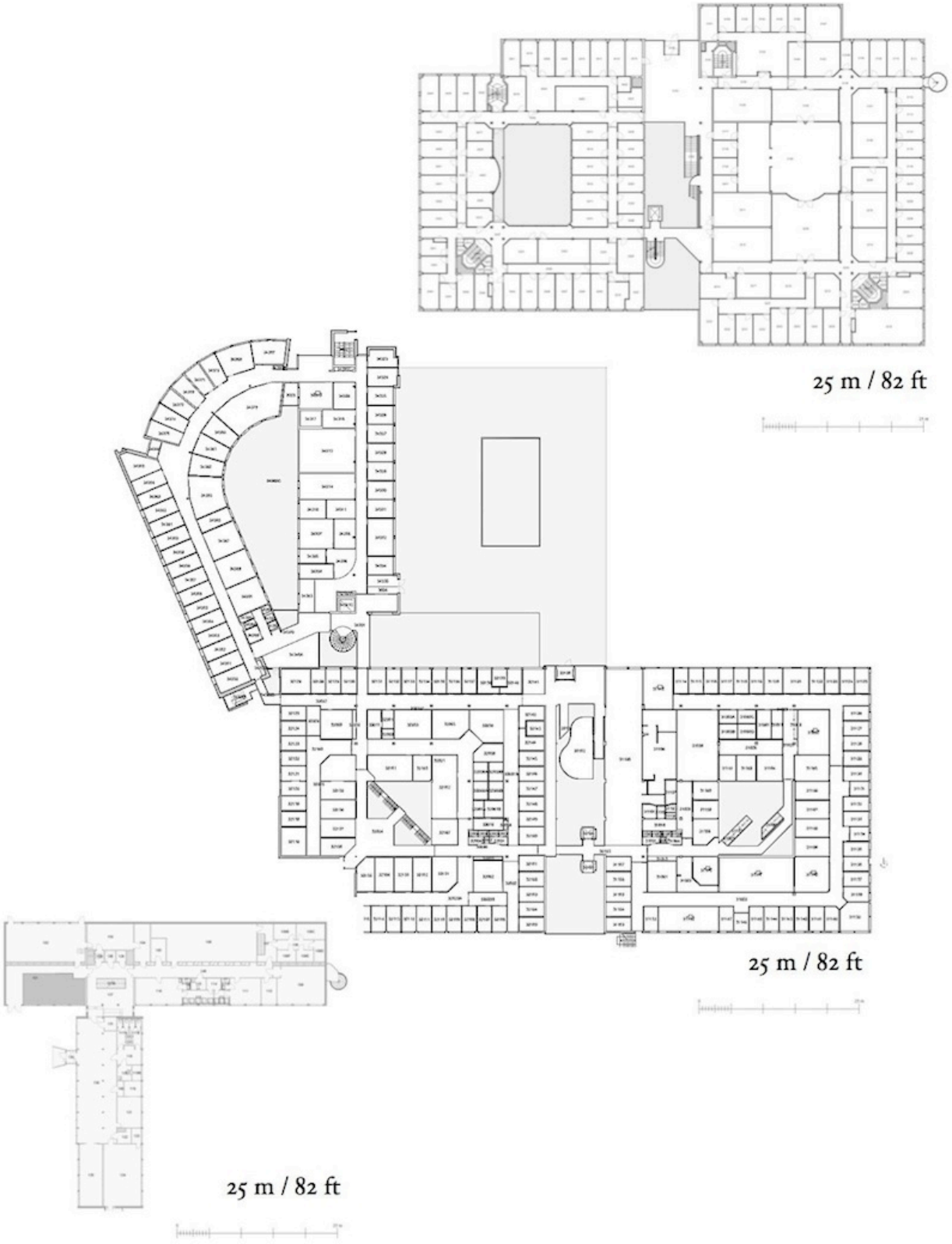


Figure 4. Ground floor layouts of the three buildings used in the study: Site 1 (top), Site 2 (middle) and Site 3 (bottom).

These three buildings were all occupied and used by students and employees of the Informatics Department of UiO although, as some spaces were shared with other institutions, not all areas were equally occupied by people affiliated with the Informatics department. All three were used as sites for the ethnographic part of this study (Chapter 5) and the Space Syntax (Chapter 4) analysis (see below and the following chapters on detailed methodological description).

Access and mobility management. The University of Oslo, like many institutions in Norway and in Scandinavia in general, heavily regulates access to its buildings. While being a visiting researcher at the Department, I experienced these regulations first hand – as a user of all three sites. Each user is provided with a magnetic ID card with coded access rights. Depending on the type of affiliation (bachelor student, masters student, PhD junior or senior faculty and others) and the institution with which one is affiliated, the university grants (and limits) spatio-temporal access. This access control system is embedded in the physical space in a form of card readers that are located at some entrances and interior doors between hallways as well as at most of the doors to offices and other rooms. At certain times – usually during core operating hours between 7 am and 4.30 pm – some of these locks are open, some require the user to both slide the card and enter a personal access code, and some require only sliding a card. Outside of normal operating hours, the restrictions are more rigorous.

As a user – when I was presented with the card and access code from the university administration – I was not specifically informed – neither was I able to find out the precise rules regulating my access as a visiting researcher to the different areas of the three buildings. As I learned interviewing other users, most of them were also confused about the access restrictions at the university. What is more, as site 2 was managed by an external

company, two sets of access control systems were present in this particular building, one managed by the university and the other one managed by the external company.

Site 4. The fourth site was a new building that was being constructed at the time of data collection. While the structure of the building was already designed, the interior was not yet fully articulated at the time of data collection for this project. Some input from users regarding the interior design was sought by those involved in making of the final decisions, in particular the head of the department as well as a user representative responsible for deciding on (broadly defined) art in the building. As this building was used as a case study for the participatory design part of this project (see below and Chapter 6 for the detailed description of this method), the stakeholders involved in the design process were present during the workshop. The building was opened in 2011 and its total area was 28,317 m^2 (approximately 304,800 sq. ft.).

Figure 5. Building 4. New building of the Informatics Department at UiO, still under construction.

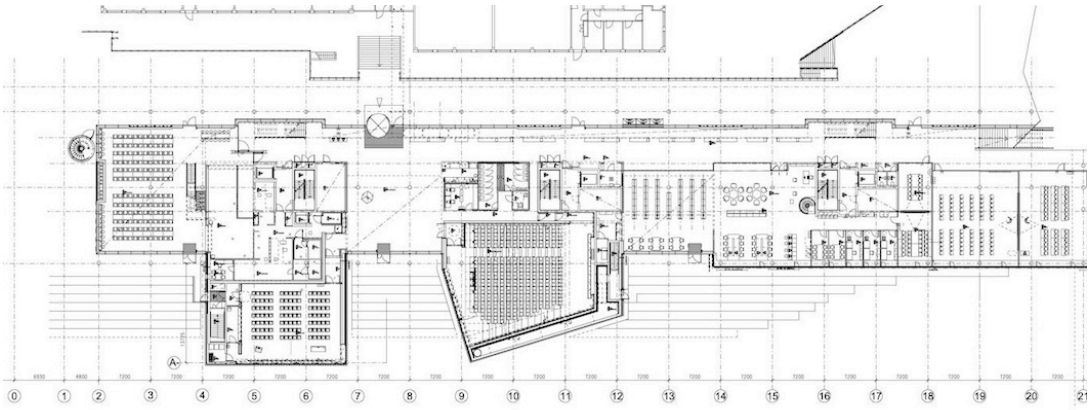


Figure 6. Layout of the ground floor of the new building of the Informatics Department at UiO (site 4).

Participants

The participants were approached and invited to participate in the study via a flyer that was posted on information boards in the department (Appendix A). A flyer was also sent via email to all potential participants in the department. Of all 1330 eligible to participate in the study, a total of twenty-four persons responded and were included in the ethnographic study (n=24). All these participants were further invited to participate in the participatory design study in which nine people expressed interest. All were included in the participatory design study sub-sample.

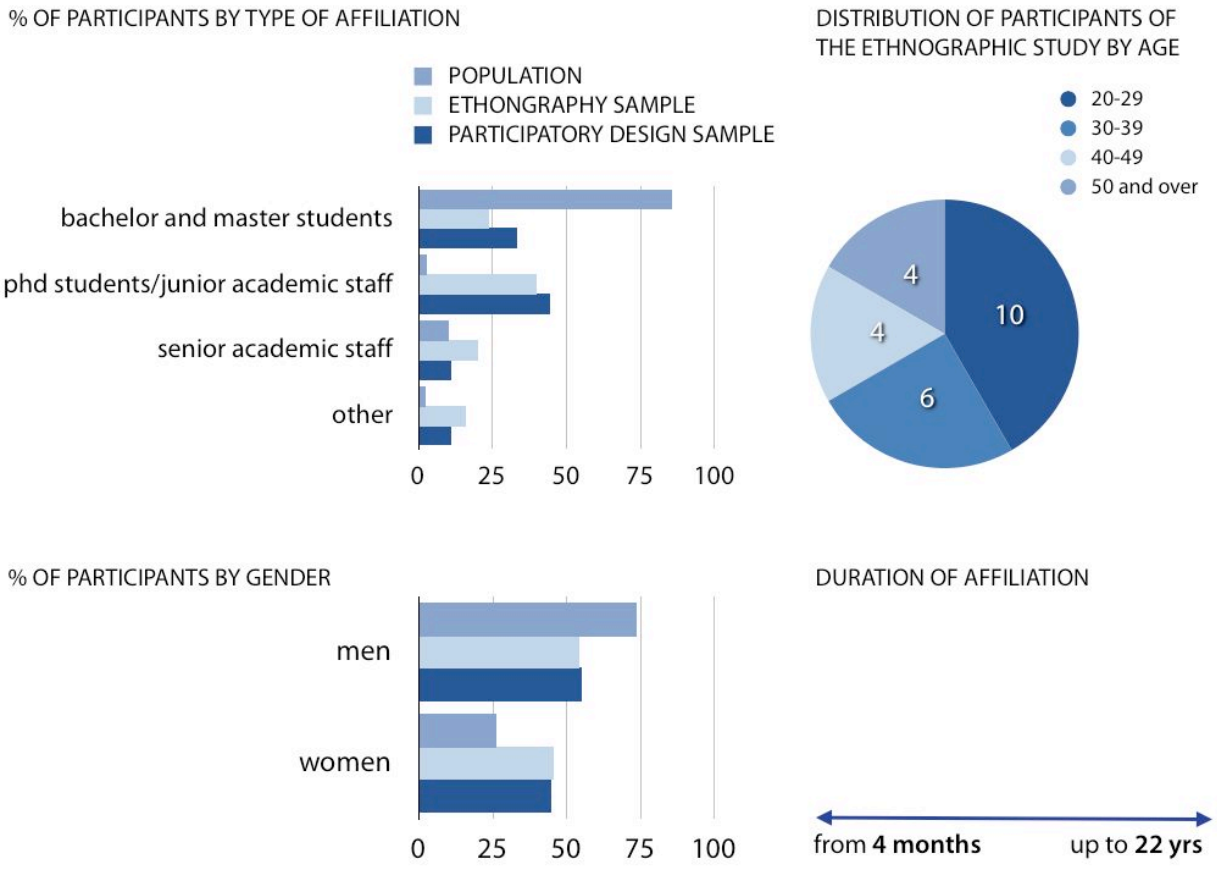


Figure 7. Characteristics of the ethnographic study sample and the participatory design sub-sample compared to distribution of all people affiliated with the department.

Chapter 4

Identifying affordances through a configurational analysis: Space Syntax

Identifying affordances through a configurational analysis: Space Syntax

This chapter is first of the three methodological chapters addressing the research question that guides this dissertation. I first restate the rationale for employing Space Syntax methodology. Then, a broader theoretical basis for this methodology is introduced and the assumptions behind the methodology are presented. The main concepts used in Space Syntax are convexity, visibility and axial map, as well as integration and are explained and visualized on a simple floor plan. The measure of integration is further discussed as a measure of spatial configuration that has been shown to partly explain human movement in built environments. After this introduction, Space Syntax methods are applied to the more complex floor plans of the three sites involved in this research project. The findings are presented in detail and discussed in the context of relevant findings from the ethnographic part of this study.

Rationale for employing Space Syntax methodology

As mentioned in Chapter 3, Space Syntax is one of the very few approaches that have been successful in addressing the relationship between the physical environment and mobility through an analysis of how the configuration of a spatial structure influences flow of people.

Another reason for using Space Syntax is that it shifts the focus of research from mental representations to the qualities of the physical environment. Re-focusing mobility research on the physical environment is one of the propositions of this project and, as discussed earlier in Chapter 2, Space Syntax is one of the few methodological approaches that succeeds at doing so.

Theoretical grounding

Space Syntax is an umbrella term for both a theoretical and methodological approach to people-environment relations. The theory grew out the conception that, to understand these people-environment relations, it is more important to study the physical environment itself in relation to how it is occupied and used rather than to study how designers create their designs (Hillier and Leaman, 1974).

The main premise of this theoretical approach, which was developed by Bill Hillier and Julienne Hanson and their colleagues (Hiller and Hanson, 1984; Hillier et al., 1993; Hiller, 1996), is that space and social relations are made through each other. This concept of *spatiality* or how *space is made through social relations and how social relations are shaped by the space in which they occur* (Hubbard et al, p. 351) is, of course, not new, having been of interest of number of theorists, in particular Marxist human geographers (see, for example, the work of Henri Lefebvre, 1999; David Harvey, 1989, 1995; and Edward Soja, 1980) and those influenced by the structuration theory of Anthony Giddens (1984). The focal point for these theorists is the social production of space or space as a product of social processes and, to a lesser degree, the spatial re-production of society. In other words, how the political, economical, temporal, and social context influences the spatial realities rather than how the physical space influences them.

Similarly, the underlying assumption in Space Syntax theory is that social information is reflected or configured in space or, more specifically, in spatial structure. However, rather than focusing on the social layer and how it produces the space, Space Syntax theory takes space or, more specifically, spatial configuration as its main focal point to inquire how space can "*reproduce the patterns in the society*" (Hillier, 2008; p. 228).

The word 'syntax' (after the Oxford dictionary, 2010) is derived from Greek *suntaxis* that stands for *sun-* 'together' and *tassein* 'arrange'. In other words, Space Syntax is about how spaces are arranged together or configured. Configuration is the key concept in this

theory. Space Syntax aims at developing "*strategies of description for configured, inhabited spaces [...] in such a way that their underlying social logic can be enunciated*" (Bafna, 2003; p. 18).

Methodology

The main topic of analysis in the Space Syntax approach is the configuration of spaces in the form of plans (floor plans or cartographic plans). The Space Syntax approach examines space not as continuum but as interconnected discrete units and aims at analyzing their topology (or how they are interrelated).

Convex map. One example of looking at space as a set of discrete units is to have each room (or more specifically each two-dimensional space in which every point is visible from every other point within it – Haq, 2003; p. 843; Hillier and Hanson, 1984) conceptualized as a **convex space** and each door opening understood as a connection between convex spaces. Such representation is called a **convex map**.

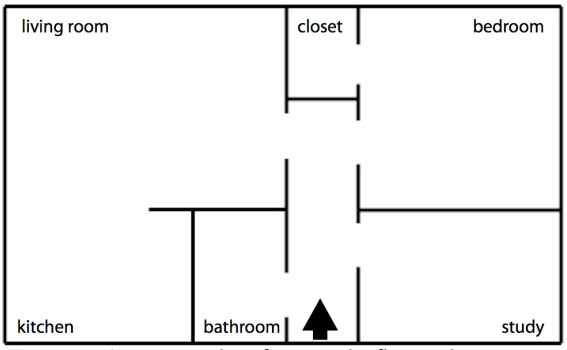


Figure 8. An example of a simple floor plan.

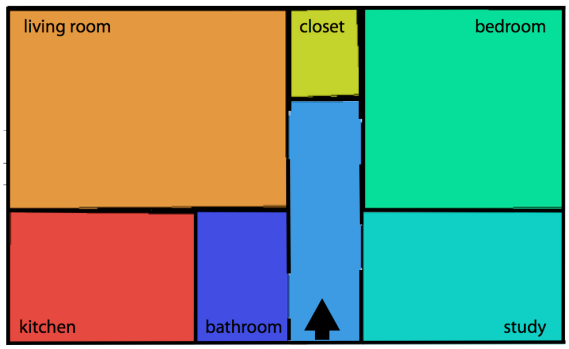


Figure 9. Convex map of the apartment, each convex area marked with a different color.

In the case of this simple apartment, we get seven convex spaces (Figures 8 and 9). Note that the 'L' shaped living room with an open kitchen is divided into two convex spaces: the living room and the kitchen. Further on, these convex spaces can be abstracted

from the metric representation of a floor plan into an abstract graph (Figure 10). The same graph can also be represented in the floor plan by color-coding the depth in which the convex spaces are embedded (Figure 11).

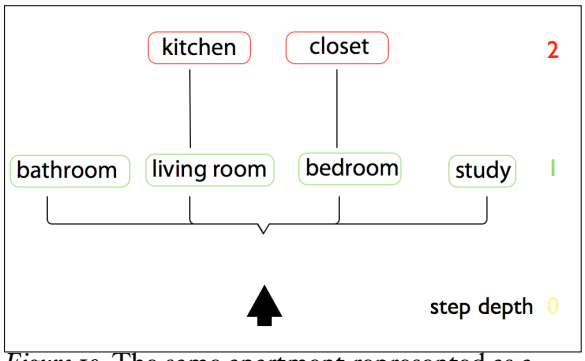


Figure 10. The same apartment represented as a discrete graph.

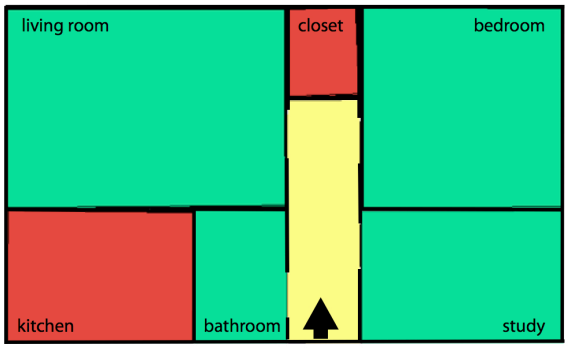


Figure 11. Convex map with step depth, spaces marked with red are embedded most when measured from the hallway.

In Figure 11, the measure of depth or, more precisely, the so-called **step depth** stands for the number changes of direction ('steps') one would have to take from a selected location (in this case the hallway) to get to a particular space.

Visibility graph. Another more sophisticated way of representing the space is a **visibility graph**. A potential user has a certain view from each point of the apartment. Some points have high visibility – meaning that a large area (or many other locations) is visible from a particular point; others have low visibility – meaning only a small area is visible from a particular point. Figure 12 shows visibility for a point in the hallway in between the two door openings. Just as in the previous example, the visibility has its 'depth'. From the chosen point, the light blue is visible and to see the green area, would require one change in direction and two changes to reach (with one's eyes) the red part of the walk in closet. If we combine such a map of visibility for all the points, it is possible to represent the space as a collection of points that vary on the scale of visibility as shown on Figure 13.

Figure 12. Visibility for a point in the hallway between the doorway to the living room and the bedroom.

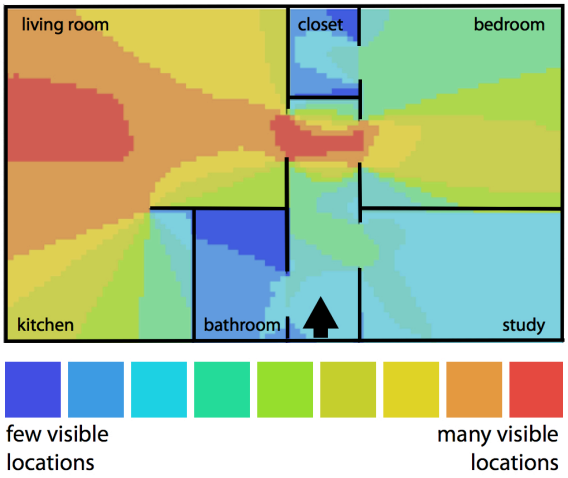


Figure 13. Cumulative visibility for all points.

Axial map. Finally, perhaps most interesting, in the context of this study, is representing the map in terms of uninterrupted vision lines. More specifically, each line, called an axial line, is the "*longest straight line that passes through at least one permeable threshold between two adjacent convex spaces*" (Bafna, 2003; p. 23). An axial map is a collection of such lines that cover the grid of the layout (see: Hillier et al., 1993). An axial map for my exemplary apartment is presented in Figure 14.

These primary lines of sight are often compared to Gibson's vistas (see, for example, Haq et al., 2005) and, within the framework of Space Syntax, are interpreted as possible movement paths. In this sense, the axial map represents a structure of possible movement:

> [A]xial maps [...] define space as a linear sequence of possible paths through a continuous space based on the idea that movement flows are determined (at least partially) by configuration (Sailer and McCulloh, 2012; p. 49).

Similar to convex maps, axial maps can be represented as graphs in which the lines are symbolized by nodes and intersections of the lines as edges (see Figure 15). And, just as in the same way as with convex map graphs, we can see that the lines carry a certain depth to them (for example the red line crossing the hallway is of least depth).

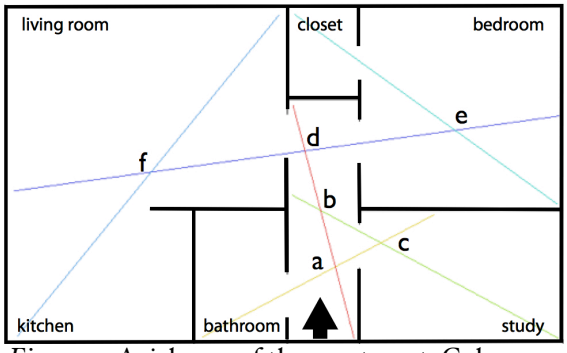


Figure 14. Axial map of the apartment. Colors are only used to differentiate between the axial lines and hold no further meaning.

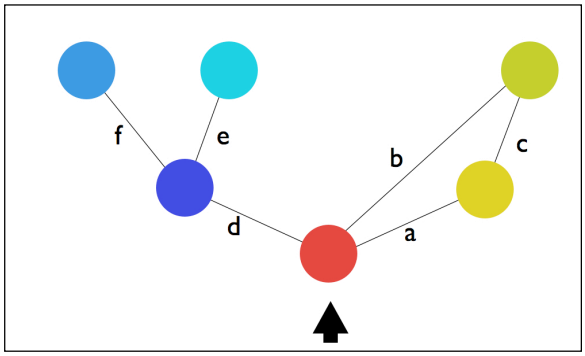


Figure 15. Graph corresponding to this axial map.

The three types of graphs are the most commonly used representations in the Space Syntax approach. Developing these representations further, the Space Syntax researchers have developed a number of syntactic measures for discrete space that have been shown to relate to how the spaces are used. Peponis and Wineman in their chapter 'Spatial Structure of Environment and Behavior' in the Handbook of Environmental Psychology (2002) compare these measures to Gibson's "affordances", a comparison that I attempt to develop further in this chapter. What are these affordance-like measures? As a detailed description of all the measures is beyond the scope of this chapter and because it has been presented in detail in numerous publications (see for example Bafna, 2003; Peponis and Wineman; 2002), I will only briefly present here the one measure that has been shown to be most relevant to mobility, namely *integration*.

Integration is directly related to depth which was described earlier. Basically, integration describes syntactic accessibility which means that nodes that are more deeply

embedded in the graph are less integrated and vice versa – the more integrated the node – the less its depth. Others provide a detailed description of how exactly integration is calculated. For the purpose of this chapter, let me refer to the explanation presented by Bafna (2003; p. 25):

> [it] is computed by calculating the **average depth** of each node from all other nodes in the graph. This mean depth is then used to compute a number called **relative mean depth** [...] which is the mean depth expressed as a fraction of the maximum possible range of depth values for any node in a graph with the same number of nodes as the system. [Relative mean depth] values range from 0 to 1. This relativization makes it possible to compare [the] values of nodes from graphs with different number of nodes. [...]

Integration is the inverse value of the relative mean depth values of the nodes of a given system. And, as depth can relate to any of the three discrete representations of space presented above, so does integration. In other words, we can calculate integration for nodes in each of the graphs. The results of the analysis of each of the three graphs as calculated by the Depthmap software[2] are presented below:

[2] As presented in the seminal work of Hillier and Hanson (1984), these measures can be calculated manually for each system. However, researchers at the University College of London developed a piece of software called Depthmap that calculates the values of these and other measures and represents them visually on the floor plans. Following the vast body of literature from within the Space Syntax tradition that has been employing this software, I will utilize it in my project as well. Depthmap is an open source software available for download at http://www.spacesyntax.net/software/ucl-depthmap/ .

Convex:

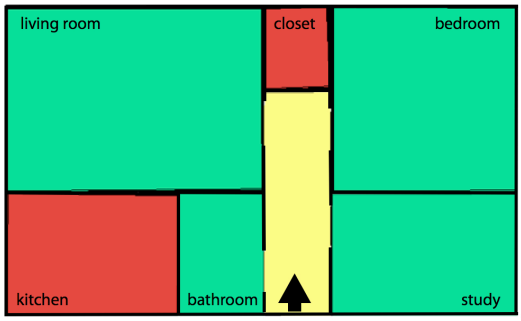


*Figure 16.*Convex map with step depth, spaces marked with red are embedded most when measured from the hallway.

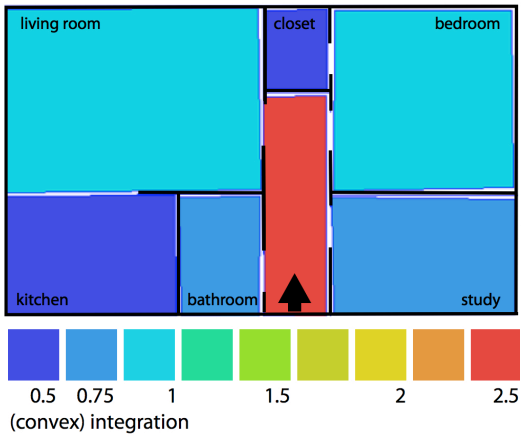


Figure 17. Integration as calculated for the convex graph.

Visibility:

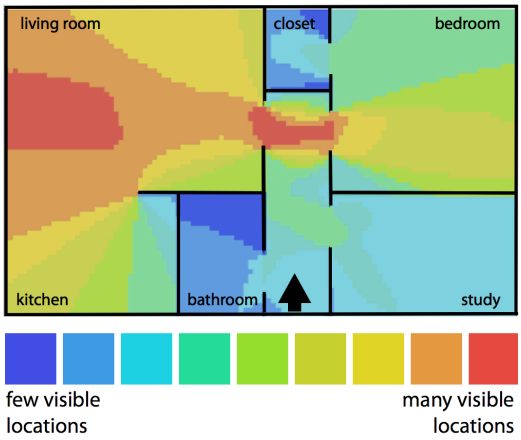


Figure 18. Cumulative visibility for all points.

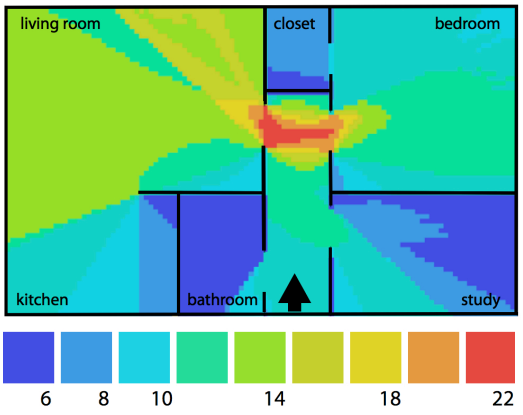


Figure 19. Integration as calculated for the visibility graph.

Axial:

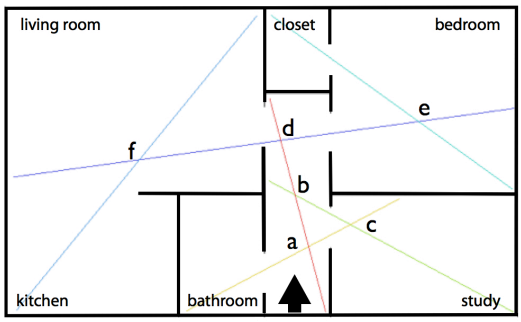


Figure 20. Axial map of the apartment. Colors are only used to differentiate between the axial lines and hold no further meaning.

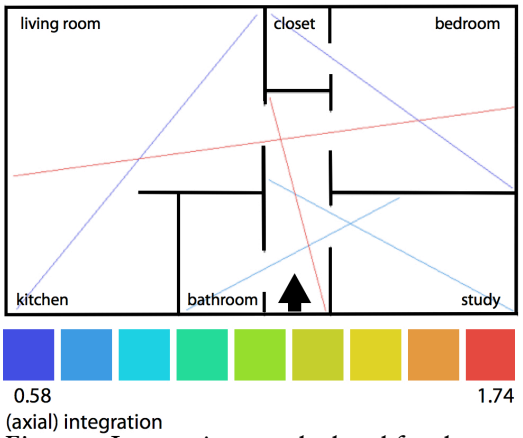


Figure 21. Integration as calculated for the axial map.

Integration and human movement patterns. Following a series of observational studies combined with configurational analysis, Hillier proposed integration as the key measure determining, at least to some extent, human movement in urban space:

> The fundamental proposition of 'natural movement' is that movement in an urban grid is determined, other things being equal, by the distribution of a configurational quantity called '**integration**' in the axial graph of the axial map of that grid (Hillier et al., 1993; p. 34).

Indeed, a vast body of research on spatial configurations and human movement has further confirmed this relationship, in particular for urban areas. Hillier et al. (1983, 1987, 1993), Hillier and Hanson (1984), Hillier (1988), and Peponis et al. (1989) to name just the few most referenced studies all have shown correlation between the two. Penn (2003) estimates that, if a program[3] of urban area is fairly equally distributed – configurational measures can explain up to 80% of movement variance and integration is the most prominent variable predicting movement. For further readings on the role of configurational measures and movement in urban areas, I refer the reader to Peponis and Wineman chapter (2002) in which they provide an extensive list of studies on this topic.

However, for the purpose of this study, a more important issue is whether configurational qualities and *integration* in particular are associated with human movement inside buildings. As Peponis and Wineman and others point out, the relationship between integration and human movement in buildings can often be modified by the location of different functions (the building's program). Despite this, a correlation between integration and movement has been shown in a number of studies focusing on indoor mobility. Peponis et al. (1990) have, for example, shown that integration is strongly related to search patterns in wayfinding tasks in buildings, in particular that the more integrated nodes were passed through more often irrespective of the points of departure and destination (p. 572).

[3] Program of urban area can be understood as distribution of various urban functions throughout the area, such as transportation, housing, services etc. Penn (2003) suggests that measures such as land use or real estate density can serve can be used to estimate whether a program is equally distributed throughout an urban area.

A study conducted by Saif Haq (2003) showed that the distribution of people and their movement in buildings is highly correlated with integration values (as calculated on axial maps) and, more specifically, with integration-3 which measures *the relationship of one space to others up to three steps or turns away from it* (Haq, 2003; p. 842). In another study, integration as calculated on axial maps correlated not only with people's movement (Penn et al., 1999) but also with the perceived usefulness of co-workers depending on their location. On the other hand, Steen and Markhede (2010) have not found any correlations between integration values and users' movements in a study conducted in 7 offices. In general, however, as Peponis and Wineman emphasize:

> [T]he correlation between integration and movement patterns is treated as an underlying principle, perhaps less visible than in the case of urban form. Departures from the correlation are expected to arise from the way in which layouts and behaviors are constrained by a building program (p. 89).

In their recent publication, Peponis and Wineman (2010) introduce the term *spatially guided movement* to make a point that while movement in the built environment is highly constrained by spatial structure it is not determined by it. In other words, just as a chair affords sitting (to use the most mundane example), so do integrated spaces afford movement (or, more precisely, the more integrated, the more these integrated spaces afford it). But if one actually sits on the chair depends on the context. If there is a soft sofa standing next to it, the suitability of a chair might never be fulfilled. In the same way, the program of a building mediates the mobility affordances provided by spatial configuration. In other words, configuration influences movement but so does a building's program (or location of the different functions that might serve as attractors).

Space syntax and experience. Despite the proven relationship between spatial configuration and movement, there is no clear theoretical framework that would further explain this relationship by conceptualizing the relationship between the environment and human cognition (Haq, 2003; Penn, 2003, Turner et al., 2007) – or as I would argue between the configuration of the environment and users' experience. As Peponis and Wineman (2002, p.278) suggest, this relationship should be treated as a *point of departure* for developing the theoretical framework of Space Syntax further.

Haq (2003), Turner and his colleagues (2007), Pinelo (2010) and Wineman and Peponis (2010) point to Gibson's ecological psychology (and its further development by Harry Heft) as a possible theoretical framework. They argue that axial lines are what Gibson calls an optic array. In fact, Gibson understands an optic array as nested hierarchy of visual angles (after Heft, 1983; p. 136) just like the hierarchy of all axial lines. The optic array provides direct information to the observer. To quote Heft:

> [f]rom Gibson's ecological approach, perception does not require supplemental cognitive processes because the information available to the perceiver is sufficiently rich so as to unequivocally specify (ibid.).

In that sense, the axial line as an optic array is the theoretical basis for understanding perception.

How to situate this conceptualization of axial line-as-optic array and spatial structure-as-affordance in a broader theoretical framework for experience? Phenomenology, though seemingly a very distinct methodology from the Space Syntax approach, has been pointed to as a possible augmentation of Space Syntax[4] (Seamon, 1994) and provides useful insights into the connection between spatial structure and human experience. Seamon emphasizes that both share "*the assumption that people and world are intimately related in a way whereby each makes and reflects the other*" (ibid.).

[4] I discuss the pragmatic and phenomenological grounds of ecological psychology in the next chapter and will only here discuss space syntax and phenomenology.

Detailed description of methods

The methods used in this part of the project were twofold. First, following the assumption that integration is one of the features of the environment, I conducted an axial analysis including generating the integration values on the floor plans of one floor of each building. This allowed me to describe each floor in terms of its structural affordances for mobility. The analysis was conducted on the floor plans of the three sites which I obtained from the chief university architect. The floor plans were then converted in Sketchup software[5] to .dxf files. The .dxf files were imported to Depthmap software to conduct the Space Syntax analysis. Integration was computed in Depthmap for all three sites.

Secondly, the daily paths of users that I collected in the ethnographic part of this study (described in detail in the next chapter) were mapped onto cumulative maps. Users (n=24) were interviewed in situ (in walk-through interviews). Participants were asked to walk through their daily paths (see Appendix B for the exact wording of the interview questions). After an interview, each participant was asked to mark on a map the paths they take to walk in and out, their way to lunch, the bathroom, to get a coffee or tea, and any other paths. These paths were then transferred cumulatively onto a floor plan of each site.[6]

[5] Sketchup is a 3D modelling software originally developed by @Last Software, now under ownership of Trimble Navigation. It is available for download at http://www.sketchup.com .
[6] The floor from each site that had the most movement (or specifically the most number of paths marked by the participants of the ethnographic study) was chosen for the Space Syntax analysis.

Findings: configurational affordances for mobility experiences

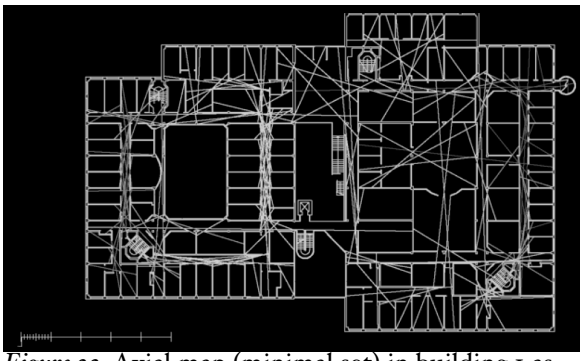


Figure 22. Axial map (minimal set) in building 1 as generated by Depthmap software.

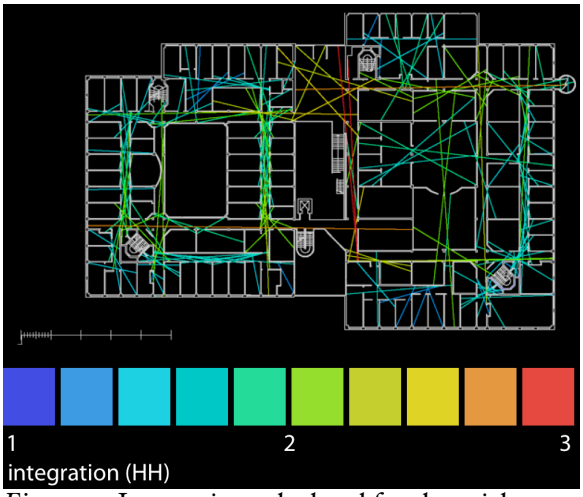


Figure 23. Integration calculated for the axial map.

Site 1. The floor plan was imported to Depthmap software which generated an axial map of a total of 11979 axial lines which was later (following a standard procedure in space syntax analysis) reduced to a minimal set of 219 axial lines (as presented on Figure 22).

Graph analysis with integration values (see Figure 23) was generated next. The analysis revealed that the mostly integrated hallway was the hallway going from the main entrance alongside classrooms. Offices located on the perimeter of the building were least integrated (marked with blue lines on the axial map), that is had high step depth or, simply put, were deeply 'embedded' in the space and, according to the theory, would require more effort (in terms of turning to get the visual access/lines of movement) to get to.

Least integrated, experienced as least attended. In the ethnographic description of their mobile experiences, participants did confirm the assumption that they use less integrated spaces less often. This was particularly true for the remote areas of the building close to its parameter that assumed integration values i < 2:

> "It's kind of a confusing building, because it is kind of big, you don't use that much of it and you kind of don't know what is happening in the other corners of this building." (79)

On the other hand, participants pointed to other than structural reasons for either not going through these spaces or having a sense that they were rarely used. One particular environmental feature was **light**:

> "[I]t is always so dark, it feels like it is a space that is really out of the way and sometimes you feel like you should not be here because the lights are off and you a have all this paper here [...] when it is dark and [...] you feel a bit alone in the building I think, in these areas, but when you get in there are often people in there. Before I started my master I applied for my space I didn't know about this place at all it is a bit hidden." (1158)

Well integrated but experienced as not attended. The library area as marked on Figure 24 proved to be most interesting in the context of Space Syntax analysis and the qualitative data. In the Space Syntax analysis, it was found to be well integrated (i > 2, as represented on the right side of Figure 26) within the whole building, and fairly attended (n=5, where the most attended path on this floor n=10, see left part of Figure 26) but was experienced by users as greatly hidden and highly inaccessible:

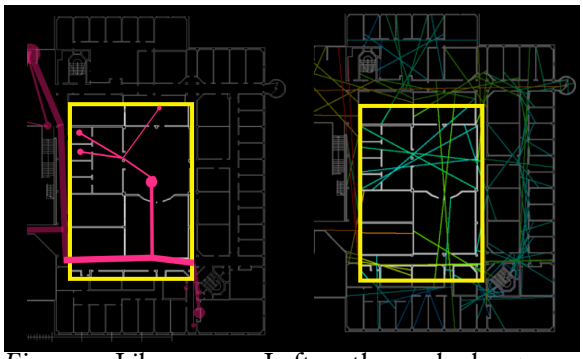


Figure 24. Library area. Left: paths marked n=5, Right: integration i = <2.1, 2.4>.

> "[This hallway] is ok, for those who should go to their offices but not to the library we are too hidden in the building.
> - So what you are saying is that it doesn't direct people to the library?
> No! so I don't know what the architects thought of, I didn't work here when they planned it but I don't think they thought about students and visitors." (1093)

> "This library and this side is hidden away, and actually I never stepped inside that place, in a way this building is designed [it] is so hidden, because you have to go through a small hallway [...] and it is a short narrow hallway, it is nothing that invites you into it, it just seems like an office hallway, you are not supposed to be there if you know what I mean. If you come to this part the library, it is open again but even here see, where does it say this is the library, welcome, and even the sign that says when it is open it is so small the thing is, I know it is here but mostly I never notice it, I never think about it, [...] because of where it is, I never go pass it, there is nothing in here, and this sign is not big enough to even notice it, you don't even see it." (678)

The particular hallway that leads to the library is highly integrated (i=2.4) and yet the library is experienced as not accessible. This participant points to two crucial environmental features that influence her experience of (not) going to the library: first is the size of the hallway leading to it, the fact that it is narrow and short and, secondly, – the inadequate signage provided. Metric qualities such as size (as opposed to the discrete qualities) and information provided clearly influence the experience of mobility. These features however are not taken into account in the Space Syntax analysis.

Figure 25. Cumulative paths in building 1 as marked by participants.

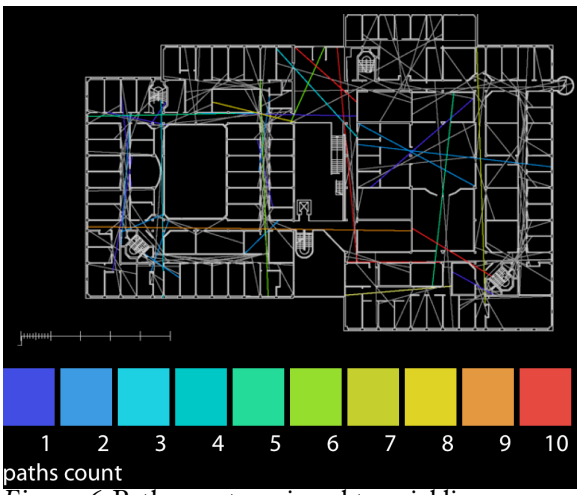


Figure 26. Path counts assigned to axial lines.

Cumulative paths and integration. As the next step in the analysis, I traced the paths marked by the study participants onto the map (Figure 25). In total, 10 persons marked their paths on the ground floor of building 1. Their main destinations (work or study spaces) were fairly evenly distributed across the floor plan. Cumulative paths ranged from 1 to 10 with 10 being the paths from the entrance towards the classrooms and library and singular paths leading to offices.

Next, values of the cumulative paths were assigned to the closest corresponding axial lines as represented in Figure 26. The values of the integration measure and the count of the paths were then compared. Further analysis revealed that the count of paths was moderately correlated with the integration with the correlation coefficient $R^2 = 0.4712$.

In linear correlation, the assumption is that the variables are evenly distributed. And although that was roughly the case for integration, it was not for path count (with many axial maps that did not have any values of path count assigned to them). This is why the path values had to be readjusted (by taking the natural logarithm of the path count values; see Turner, n.d. for how it is done in Depthmap). After readjustment, the correlation coefficient was $R^2 = 0.4898$. It can be interpreted as some, though not very dramatic, correspondence between the two. In other words, the spatial structure affords to some degree the patterns of mobility with the building.

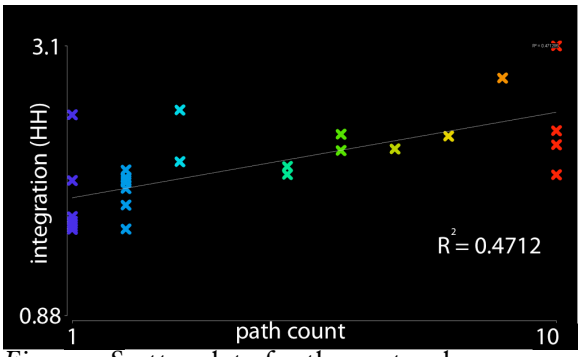


Figure 27. Scatter plot of path count and integration values.

It has to be underlined that some of the movement has clearly been influenced by the building's program. The case of the library is very particular here. It is located in a fairly integrated area. It was indicated by five of the study participants as one of their destinations and yet, it was experienced as very hidden (not integrated). In this case it is probably the case that it is the program of the building that is dominant and not the structure of the building that has generated the movement. A library is functionally very important to the users of this building and we might expect that with spaces like this that are functionally so important to the user are less subject to the influences of spatial configuration.

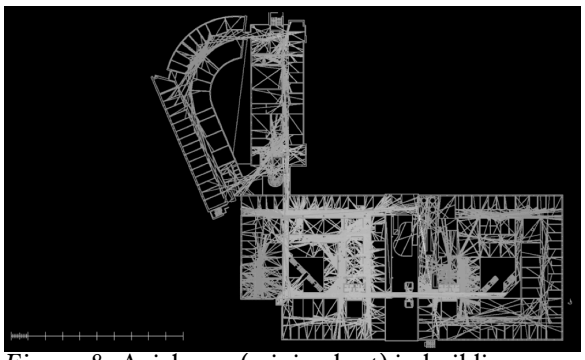


Figure 28. Axial map (minimal set) in building 2 as generated by Depthmap software.

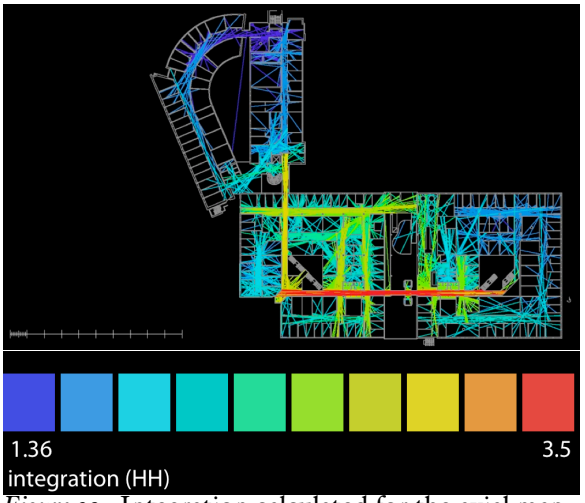


Figure 29. Integration calculated for the axial map.

Site 2. A similar procedure was used for building 2. The floor plan was imported to Depthmap which generated an axial map of 16147 total axial lines later reduced to a fewest line subset of 3648 axial lines (as presented on Figure 28). Similar to site 1, least integrated areas were the areas located on the perimeter of the building. This site consists of two buildings connected with each other and the one called 'hus 2', with a curved hallway proved to be weakly integrated with the other one. The most integrated connection was the hallway going across 'hus 1' connecting the two parts of the building, staircases, and the elevator.

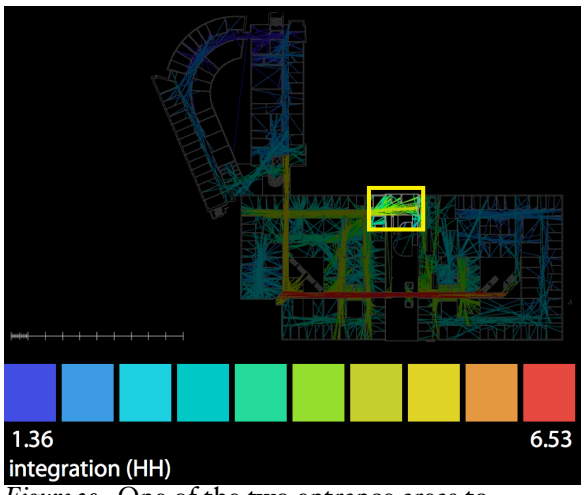


Figure 30. One of the two entrance areas to building 2.

Qualitative data directly referring to structure and spatial configuration of this building was very scarce. Participants rarely if ever discussed the layout of the building.

The one area that has received some attention was the entrance to 'hus 1' (marked on Figure 30). With integration values for the axial lines verging <3.9, 4.5> (mid scale) it can be described as fairly but not dramatically integrated. High integration was, however, what

the participants were expecting, as they would enter the building:

> "I sort of feel that this is a strange entrance of the house. [...] So normally when you come in, I mean that is the reception but you can't see, you just walk in here and you are met by the stairs. It was a little bit... I don't know if confusing is the right word. I mean it still puzzles me because I don't think it is particularly good layout. [...] I mean normally one assumes that you can enter a room which is more like... you can sort of more see the reception [...] I don't know, I would more expect like an open space." (179)

In other words, this participant expected an entrance area with axial lines with greater integration but, instead, 'were met by the stairs'.

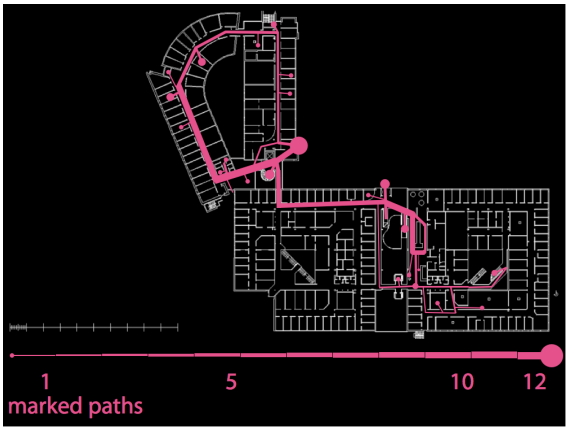


Figure 31. Cumulative paths in building 2 as marked by participants.

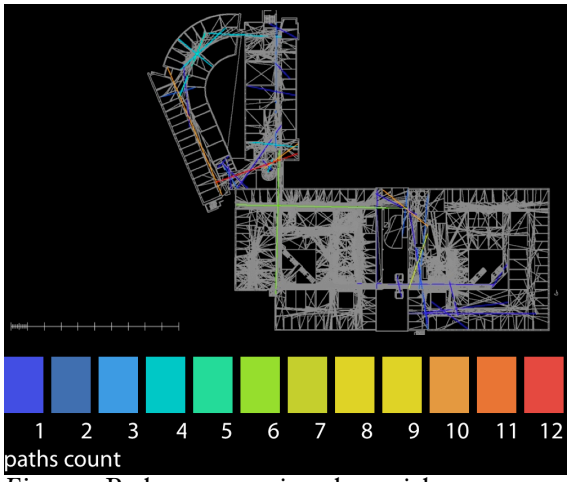


*Figure 32.*Path counts assigned to axial maps.

Cumulative paths and integration. In total, 10 persons marked their paths on the ground floor of building 2. Cumulative paths ranged from 1 to 12. The most attended path was the second entrance (entrance to 'hus 2'), the main hallway in that part of the building as well as the hallway leading from 'hus 2' to the dining commons ('cantine') in 'hus 1'. The distribution of the main destination was not as even as in site 1. It was caused by the fact that the building was occupied by other institutions and departments that did not participate in this study. Clearly, the uneven distribution of main destinations (work and study spaces) has influenced the paths taken by this particular sample and interfered with the quantitative findings. It might also

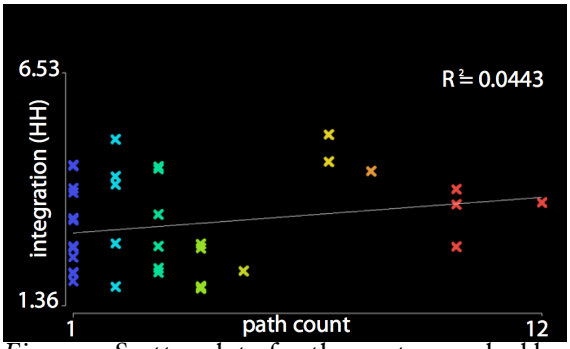


Figure 33. Scatter plot of path count as marked by participants and integration values.

explain the lack of correlation between path count and integration (see Figure 33). Another possible explanation is that the strong program of the building does not correspond with the configurational affordance (in particular, the location of dining commons, a daily destination for the building's users which is not a well integrated area).

Figure 34. Cumulative paths in building 3 as marked by participants.

Site 3. Only three participants marked their daily movements on the ground floor of the third building, all three marking the same path (Figure 34). None of the qualitative data from this location referred to configurational qualities. Because of these limited data, this site was excluded from analysis.

Conclusions and methodological limitations

The spaces that were experienced by the participants to be embedded or hidden are usually spaces that are not well integrated. One very prominent (and very often mentioned) exception is the library in building 1. The Space Syntax analysis shows it as a fairly integrated space. However, it is experienced as very hidden despite the fact that it is also experienced as open and light. The reason for it being experienced as hidden according to the users' accounts is that one does not get their direct access from the main area by the entrance but rather has to get through a dark, narrow hallway first.

Neither light nor metric qualities are included in Space Syntax analysis. This critique has been previously pointed out (for example, by Montello, 2007) and this study has provided some examples of how these qualities might influence mobility in the built environment.

Furthermore, Space Syntax as calculated on axial lines does not assign weight to the building's program (or the distribution of its different functions) instead using integration as a global value (that is, comparing spaces in the context of all other spaces in the building equally). The example of a library that is experienced as inaccessible on the path from the main entrance in building 1 illustrates the shortcomings of this approach: the global analysis of configuration does not take into account the fact that the entrance (function) influences the directions from which most of the users would be coming.

Finally, the qualitative data presented in the following chapter strongly indicate the significance of such environmental features as, for example, doors and embedded technology regulating access in influencing everyday mobility, yet these qualities are not included in configurational analysis.

All these shortcomings do not refute the assumption of the structure of the environment as an affordance guiding human movement in architectural settings. Rather, they underline the complexity of this relationship. If an integrated hallway will indeed

afford walking, it depends on other environmental qualities. To draw a parallel to the often quoted example of an affordance: a chair might possess the affordance of sit-ability but if the person actually will sit on it depends not only on the person but also on other qualities of the chair as well as the broader context. If the chair is standing outside in a heavy rain, its sit-ability might be dramatically lessened. Similarly, a well-integrated hallway might afford, or invite, less movement because it is dark and narrow. Additionally, if a space is important for users because of its other, non-configurational, properties (like, for example, function in the case of a library) this may either counter or strengthen the configurational affordances for mobility.

Chapter 5

Identifying affordances through an ethnographic study of mobility

Identifying affordances through an ethnographic study of mobility

This chapter discusses phenomenologically oriented ethnography as the second methodology of choice to address the research question guiding this dissertation. After presenting a brief rationale for this approach, I examine the theoretical and methodological groundings for both phenomenology and ethnography as paradigms for studying mobility experiences. Next, the specific methods of this study are presented to be followed by thorough analysis. The analysis is divided into two sections. First – the mobility experiences are identified from the data collected, next – the affordances that influence these experiences 'on the move' coupled with the mobility experiences. Each affordance is briefly described, usually accompanied by a photo of an actual physical feature and a direct quote from the data. As this is the findings section, relevant literature is not referenced here, rather to be taken up in the discussion section at the end of this chapter, where findings, and the identified affordances in particular, are put in the broader context of environmental psychology. Finally, a model of mobility experiences coupled with identified affordances is presented.

Rationale for employing phenomenologically oriented ethnography

The goal of this study is to address an issue that previous research has not examined, namely to identify affordances and the accompanying experiences of mobility. My focus is on identifying the multiplicity of mobility experiences and their accompanying affordances. An exploration of a topic that has not been extensively studied calls for qualitative methods as they do not demand predefined variables to rely on, therefore allowing instead for the importance of phenomena to emerge from data (see Camic et al., 2003; p. 8 on exploration and theory development). With the research aim of exploration, both phenomenology and ethnographic methodology are valuable approaches to undertake (ibid., p.8).

Methodology

I understand methodology as a theoretical framework that guides the choice of research methods. In relation to studying environment and experience, two main methodological paradigms have been dominant in the recent decades.

The Phenomenological paradigm. The first paradigm that I propose is phenomenology or *the study of phenomena as experienced by man* (sic.) (Giorgi, 1971; p.9; after Seamon, 1979: p. 16). Phenomenology's explicit goal is the description of subjective experiences with a particular emphasis on the meaning of objects and the lifeworld (see, for example, Graumann, 2002; Seamon, 2000). Phenomenology aims at capturing the world in the words of the inhabitants (Graumann, 2002) or, as Seamon puts it, "*examining and clarifying human situations, events, meanings, and experiences as they spontaneously occur in the course of daily life"* (Seamon, 2000). Within environmental psychology or environment behavior studies, most researchers who choose phenomenological methodology follow the hermeneutic paradigm. Hermeneutics is understood as interpreting (text) and, in the case of hermeneutic phenomenology, it is the interpretation of the encounter with the objects, materials, or environment by people that is studied (see, for example, Seamon, 2000 for an overview of the hermeneutic tradition in environmental psychology).
A phenomenological study is usually conducted using what Husserl called *phenomenological reduction*, or making the everyday lived experiences which are usually habitual and not paid attention to, a subject of reflective analysis (Seamon, 1979, Cogan, 2006). This leads to a description of everyday events and, as phenomenologists argue, accurate depictions of lived experiences.

A good and a very relevant example in the context of my research question is the work of David Seamon (1979). Seamon adopts a hermeneutic phenomenology approach to study movement in everyday life. His method of choice was a group inquiry in which

a group of people interested in the topic of everyday movement met regularly to share their experiences. This chapter is too limited to refer to Seamon's work in full. However, I do want to emphasize his findings that are relevant to this study. Through the phenomenological inquiry of everyday movement experiences, Seamon identified six qualities that environmental design should aim for to support what he called a place ballet (see also Chapter 3). A place ballet is supported when people are attracted to the place (**attraction**) and feel invited (**invitation**). These two qualities are closely related. Further on, to support a place ballet, a place should be comfortable and convenient (**comfortableness**), support a diversity of uses (**diversity**), and carry a sense of identity that makes it distinct from the larger environmental context (**distinctiveness**). The final quality is the **attachment** or "*the sense of responsibility and devotion that participants feel for place ballet. Attachment is intimately related to at-homeness and dwelling*" (ibid.; p. 149).

Critique of phenomenology as a methodology. These categories developed by David Seamon are very relevant to my research question because, as we will see in further sections of this chapter, they touch upon some of the experiences associated with movement in the environment. However, from the perspective of my research question, there is one major drawback to what sort of findings this methodology reveals since the findings tell us very little about the physical environment per se or, more specifically, little about the affordances for mobility. While it is the pairing of the experience of movement and the environment that was the main research interest in Seamon's study, it does not come as a surprise that it was the individual experiences and not the physical environment that came to the forefront of his findings. One possible problem lies in the selection of the method used which, as Kusenbach points out:

> [C]onducting sit-down interviews usually keeps informants from engaging in 'natural' activities, typically taking them out of the environments where those activities take place. This makes it difficult to grasp what exactly the subjects are talking about – if they are able and willing to discuss at all what

> researchers are interested in. In both cases, important aspects of lived experience may either remain invisible, or, if they are noticed, unintelligible. This is especially true for the spatial footing of experience and practices in everyday life (Kusenback, 2003; p.459).

In my choice of methods, I overcome this shortcoming by applying in-situ methods that allow one to identify the exact environmental features participants talk about.

On an epistemological level, phenomenology is often criticized for being unscientific (in the positivistic sense of understanding science). However, others have argued that the phenomenological paradigm has a potential for contributing to environmental psychology precisely because of "opening it up to a variety of dimensions of human experience of environments" (Saegert, 1993, p. 73) or to be a possible way to understand the "*gestalt of the user's environmental experience"* (Vischer, 2008; p. 235). It seems that building on a phenomenological approach to study affordances could also be an approach that would fit within James Gibson's framework and understanding of affordances. Although, as Heft points out, Gibson, with his experimental inclinations was far from being a phenomenologist, he did conceptualize affordances with an opening for experiences allowing for a phenomenological inquiry in study of affordances (Heft, 2001, p. 117).

Ethnographical paradigm: learning from Human Computer Interaction.

Another methodological approach, perhaps even more widespread in recent years in studying experiences in the context of design, is the ethnographical paradigm. Ethnography is a complex if not problematic term in itself (for a discussion of the complexities of the definition see, for example, Agar, 2001 or Finken, 2005). With this in mind and for the purpose of this chapter, I choose to understand ethnography following Ingold as a "practice of verbal description" (Ingold, 2001; p. 242).

Application of ethnographic methods to study user experiences has become a central mode of study within the broad design disciplines and, in particular, within the interdisciplinary field of Human Computer Interaction (HCI). Interestingly, the concept of affordance has gained popularity among HCI researchers mainly due to Donald Norman and his 'Psychology of Everyday Things' (1988) and is now a part of the dominant discourse within this discipline (see, for example, Amant, 1999; Christou, 2005; Norman, 1999; Turner 2005). In more general terms, the popularity of ethnography in the HCI discipline is an expression of a paradigm shift away from studying cognition to studying user-experience (see, for example, McCarthy and Wright, 2004; or Greenbaum and Kyng, 1991; for more on the paradigm shift). Within this newer paradigm, user experience is conceptualized as "*an irreducible totality of people acting, sensing, thinking, feeling, and making meaning in a setting, including their perception and sensation of their own actions*" (McCarthy and Wright, 2004; p. 54). In that sense, HCI's research interest departs from cognition – it is no longer just perception, thinking, language, reasoning, nor problem solving, but the totality of user experience. What is more, the post-cognitive HCI field attempts to embrace what Suchman calls (2007) the situatedness of actions that is the fact that an action is set in an actual socio-spatial context. Studying mobility with its situatedness in a particular spatial and social context is one of the aims of this study.

One could argue that the reason for ethnography being the methodology so often chosen to study design in use, and the designed technology in use in particular, is that this methodology provides a 'thick description' of use (Geertz, 1973) allowing for recommendations directly applicable into design situations for the totality of user experience. Ethnography, unlike phenomenology, delivers not only descriptions of phenomena as experienced by participants but also descriptions and interpretations of the socio-spatial context derived by the researcher from her fieldwork. And, unlike laboratory studies, it refers to 'real life' situatedness.

Critique of ethnography as a methodology. Kusenbach (2003) points out that two main methods in ethnography, namely participant observation and interviews, have their drawbacks. Participant observation provides data on behavior in natural settings but rarely gives insight into people's actual experiences as they rarely comment on what is happening as things happen. On the other hand, sit-down ethnographic interviews, just like sit-down phenomenological interviews, separate the person from the experiences as they take place. I agree with Kusenbach, who argues that "*[i]n both cases, important aspects of lived experience may either remain invisible or, if they are noticed, unintelligible*" (ibid., p. 459).

Methodology of choice: phenomenologically oriented ethnography

To tackle my research question, I therefore employed a methodological approach that builds both on phenomenology and ethnography. My aim in this part of the study was to identify the broadest possible range of affordances for mobility and the possible experiences with which they are coupled. My focus was not on the mean or average experience of a 'typical user'. Instead, my goal was to explore the broadest scope of possible affordances for a diversity of users. I was guided by the philosophy behind 'Design for all' approach (Clarkson et al., 2003) aiming for a design responsive to users with multiplicity of needs and not of focusing on an average (non-existent) user.

Methods

The particular methods used in this part of this study consisted of phenomenologically oriented ethnographic inquiry that included walk-through interviews accompanied by photographic documentation and participatory mapping.

Walk-through interviews. The walk-through method consists of walking in "*co-present immersion with"* the participant (Urry, 2006; p. 40) while simultaneously conducting

interviews, observations, field notes, and other types of ethnographic research. Another version of this method is to participate in the mobility patterns and conduct further research such as individual interviews or focus group interviews after the walk. Historically, the method has been developed as a method for Participatory Rural Appraisal and included walking with or by local people through an area while conducting what could be now be called a participatory audit; identifying different areas, land uses, vegetation, crops, etc. (for more see: Chambers, 1994). This method, under the name of 'the go along', has also been used by Kusenbach (2003) specifically to study lived experience in urban settings. She argues that "*[w]hat makes the go-along technique unique is that ethnographers are able to observe their informants' spatial practices in situ while accessing their experiences and interpretations at the same time"* (Kusenbach, 2003; p. 463). That approach brings the best of the two worlds of phenomenology and ethnography together.

I planned the walk-through interviews aiming at disclosing the coupling of the environment and the experiences of mobility. The participants were asked to repeat their regular movement patterns and were interviewed and tape-recorded throughout these walk-throughs. They were also asked to document the places and physical qualities that influence their experience of movement. The interview was followed by a mapping exercise to mark the paths that participants take daily (see the interview protocol in Appendix B for the exact wording of the interview and follow up exercise.).

Walk-through interviews lasted, on average, an hour (the shortest interview lasted 20 minutes while the longest lasted over an hour and a half). Participants took over 350 pictures and each of them annotated a set of maps matching their daily paths.

Analysis

Logistics. Walk-though interviews along with accompanying photographs were first transcribed in software called Visual Understanding Environment[7]. The VUE that was used could be compared in some ways to GIS software but it includes qualitative data. Basic layer (layer 0) was assigned to floor plans and then each interview was transcribed on consecutive layers. I decided to use VUE as the first choice for transcribing my data as it allowed me to couple the data with specific locations on the floor plans or, simply put, write down the interview occurrences over the area in which they took place. Photographs taken by participants were assigned to the participants' comments. The final version of the data set allows the viewer to zoom in at any specific location and see all the comments made about this specific area (see Figure 36). As the interview focused on five types of different paths, the quotes as well as paths in the dataset were color-coded, depending on the type of path (see Figure 35).

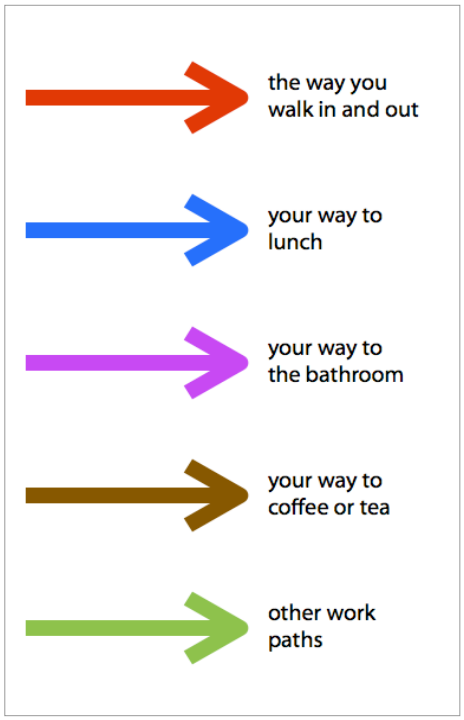


Figure 35. Color coding of the paths, as drawn by participants and represented in the VUE dataset.

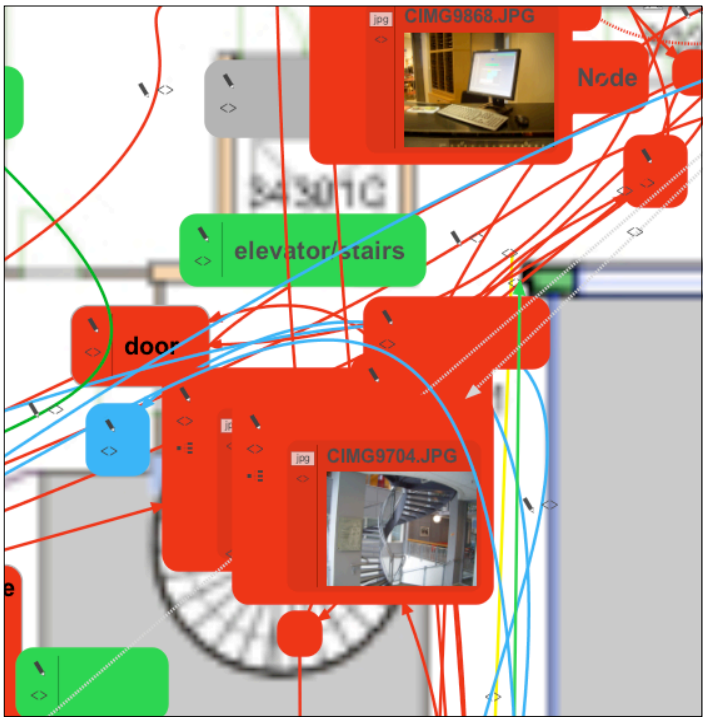


Figure 36. Fragment of the dataset in Visual Understanding Environment. Each square bubble holds quotes from the study participants.

[7] Visual Understanding Environment (VUE) is an open source software developed at the Tufts University and available for download for free at www.vue.tufts.edu .

While transcribing the data, I also simultaneously coded them with bottom-up codes that emerged directly from the data with a focus on:

- different mobility uses as well as experiences that accompany them (or, in other words, what participants did, thought, and felt when moving through the spaces);

- environmental characteristics associated with these experiences (such as doors, corridors, entrances, light, sound, smell, etc.);

- as well as any other concepts emerging from the data.

As the transcription has taken place over a substantial amount of time, in order to keep consistency of the codes as well as to assure reliability, the data were coded again using Atlas TI[8]. I then coded the verbal data again, independently of the original data set. This made the content analysis easier given the functionality of Atlas IT. The codes used in the second round of coding were the codes used in VUE and additional codes that emerged from the data as well as some top-down codes from the literature review (for more about these codes, see the following section on findings).

The analysis that followed consisted of working with data in both pieces of software – as independent sets. When analyzing a specific code in Atlas IT, the same code along with associated terms were searched for in the VUE data base. Additionally, when analyzing an environmental feature of a specific location, all the data annotated to this location were analyzed.

The analysis will be presented by starting with experiences identified and followed by affordances coupled with aforementioned experiences.

[8] Atlas TI is a proprietary computer program designed for qualitative data analysis developed by Thomas Muhr at Technical University in Berlin. Available for purchase at http://www.atlasti.com/ .

Negative bias: breakdowns and negative experiences

While the analysis of the data was purely qualitative and I have refrained from statistical analysis, it can't go unnoted that were over twice as many instances of negative experiences (106) than positive experiences (50). Furthermore, neutral experiences have rarely been specifically pointed to. This kind of **negative bias** goes in line with arguments presented by Heidegger (1962) and later developed in the concept of 'breakdown' by Winograd and Flores (1986, see also Madsen, 1988, Bratteteig, 2004) which points to the fact that people tend to notice and comment on things when they 'break-down' or don't work as expected.

Heidegger proposed a distinction between objects being **present at hand** and **ready to hand**. When we use things to achieve some goals (as, for example, using a hallway to get to a destination) we use them without, as Heidegger puts it, *theorizing* about them as they are 'ready to hand'. They do not require any particular attention from us to use them. They remain, in a sense, transparent to us (Bratteteig, 2004; p. 192). When they break however, they become 'present at hand', and we start observing the things and theorizing about them. This attitude only surfaces when things break or stop, that is in a situation of a breakdown. Heidegger differentiates between three different categories of breakdowns: conspicuous (when objects are damaged), obtrusive (missing a part), and obstinate – when they present a barrier to perusing something. This last breakdown of experiencing barriers that inhibit us from achieving goals (or, in this case, hinder our mobility) is of particular interest for this study. It is exactly in the situations of experiencing barriers or hindrances to their mobility that participants were mostly reflecting on the objects – or the physical environment. Otherwise – the environment 'ready at hand' to use Heidegger's category remained in the background.

The negative experiences associated with mobility were coded with the following bottom up codes (starting with the most frequent occurrences): confusion; being irritated,

annoyed, or frustrated; finding something strange (when there was a dissonance between the actual environment and person's expectancies), the sense of (not) being supposed to go somewhere; feeling of not being invited; psychological discomfort; not understanding something (either the environment or the rules governing it); experiencing the environment as not nice or experiencing the environment as boring or not engaging; not having control over the environment; a feeling of not being at home or not belonging somewhere, a mild basic negative emotion (dislike); physical discomfort; fear or anxiety; a feeling of being subjected to power; the environment experienced as depressing; strong negative emotion (hate); negative aesthetic experience; being unhappy. These codes were further grouped into the following larger categories:

Figure 37. Categories of negative experiences associated with mobility. The categories are not exclusive and might intertwine in some of the codes.

These categories are not exclusive of one another. In other words, some were experienced at the same time and space. This is best exemplified by the following category.

Negative emotional and behavioral components to the experiences. First, this category embraces mild and strong general negative emotion such as:

- dislike and hate:

> "I hate this door too. Because it goes the wrong way for me." (36)

- and more specific negative emotions such as fear and anxiety:

> "I like to take the elevator, because I am afraid of heights and so I don't like to take these stairs because I feel very uncomfortable." (254)

- frustration, annoyance and anger:

> "[T]his door is REALLY annoying, I have to go in and out of this door all the time and it is not enough to just draw the card, actually I have to press the code, that is REALLY annoying, I mean REALLY REALLY annoying [...] that is the most annoying thing in the whole building it really pisses me off." (585)

- feeling sad and/or experiencing something as depressing:

> "[W]ell it evokes a bit frustration because I know it will become very ugly in a few months time [...] I am not very happy being here." (1033)

As these quotes show, the basic reactions are usually coupled with other experiential components. The last person is both not happy and frustrated because of his aesthetic experience; the previous person's discomfort is coupled with a feeling of annoyance. In fact, discomfort combined with frustration, annoyance, or even anger has been the strongest

coupling between an experiential category and a basic emotion in the whole data set. It was also followed by the coupling of negative emotions with not understanding the environment, with lack of agency, and with no sense of being invited. The remaining three categories: no sense of belonging, lack of engagement, and negative aesthetic experiences, although mentioned by the participants, were not dominant. Sometimes, however, the participants would express negative emotions or states, such as "I don't like it here" but would not verbalize further what they associated these states with. Therefore, I defined it as a category, yet it is strongly coupled with all other categories in the model.

Secondly, this category also includes what I called a basic 'negative behavioral component'. The behavior that comes as part of negative experience can manifest itself in different forms. Perhaps the most common one is more neutral 'not use' or a more active 'avoidance'. Analysis of the category of a negative behavioral component is somewhat problematic as the walk-though interviews focused on the paths that the participants were accustomed to taking. The participants mentioned only a few of the paths that they were not familiar with or felt that they had to avoid. These unused or seldom used areas are also visible on the cumulative maps showing where the participants did not go. However, these streams of data do not provide enough information to infer the possible experiences or affordances that could be associated with this non-use.

Experiencing discomfort and inconvenience. Negative experiences associated with comfort can refer to physical or psychological discomfort. Physical discomfort includes among others; noise, temperature, or unpleasant smells. They often come as simple environment-person coupling as in this case:

> "Is not the most beautiful invitation to the building [...] because I am walking through this underground parking garage. So it is not... Here usually they have garbage stuck up. So, uhm, it smells pretty bad." (107)

On the other hand, it might be a more complex relation. The environment might require an action from a user while at the same time decreasing her comfort. An example here would be taking off one's gloves out in the cold to take out an entry card in order to open the entrance doors. The hands become cold. Or, when carrying a coffee in one hand, a user has to fish for a key in a bag and she realizes she could use a third hand. These are the moments in our mobility experiences when physical discomfort brings the body to our awareness. This discomfort might cause a route change as here:

> "[W]hen I was working at X and you carry a lot of equipment then you have to take a trolley and use the elevator but otherwise I don't." (251)

This code is also called experiencing inconvenience as participants very often pointed to discomfort related to inconveniences and barriers to their movement:

> "[W]hen you come in late and it is dark, this is really an obstacle because you can't really see the numbers." (386)

Psychological discomfort, on the other hand, was usually referred to when participants stated that they felt uncomfortable or inadequate as in the following case:

> "It would be not THAT comfortable to walk here because then you just want to pass quick, because you are probably intruding in their space." (468)
>
> "This makes a sound so if I am in a shy mood, I don't want to be seen, I usually don't use it." (945)

'Strange' has emerged as a separate yet related code to the feeling of discomfort. It usually referred to situations in which participants were feeling uncomfortable because the environment did not match their expectation as to what it should look like or how they would understand the environment. In that sense, it also partly falls into the next category (sense making).

> "I get here and it is strange [...] it is just strange to have two doors to the stair area." (650)

Difficulties with making sense of and understanding the environment. The category of negative cognitive experiences refers to mobility situations in which participant either did not understand the environment or the rules governing it and/or felt confused:

> "[T]his building is too complicated I think. You have to experiment, you have to go all the way down the hallway to find out that the door is locked and then you have to go back and then you miss your subway." (324)

Lack of agency and the power of 'they'. The category 'lack of agency' encompasses two codes: a sense of not having control over the environment and a sense of being subject to some external power or being policed in one's movements. The latter is often spoken of as mobility spaces in which users are or are not supposed to go. The specific affordances of inviting/directing mobility will be discussed in a later section on affordances. The two codes are closely related and often difficult to separate as in the following example:

> "I have been thinking of this door as some kind of physical power, because this door irritates me a bit, because somebody somewhere decides that this door cannot be used according to some criteria [...] I have never seen any information about this, it might be that the information is available somewhere but I have not seen it [...] I could use that door, and suddenly I cannot use it, which is in a way an expression of power. But this is very physical power; the door is closed." (299)

As the above quote shows, the sense of not having agency over the environment is also often related to a code from the previous category, namely not understanding how the environment works. This brings up the question of, if the user has a sense of being policed, who is it that is policing him/her? In other words, who are 'they' and what power do they hold? According to the participants the power 'they' hold is quite omnipresent:

> "[T]hey are more concerned with keeping people inside connected." (536)

> "[T]he feeling is temporary, and you know, they are not stupid, they have their reasons for it, this is supposed to be a place for people that move in, move out, develop, move to another space." (601)
>
> "[T]hey are very focused on getting the light here [...] so they have sort of cut off here to be able to get the natural light down there (604).
>
> "I know they put some information on that screen but they never look at it I don't think that many people do." (1140)
>
> "I think it is a bit weird that you have to use a card to get out [...]. It feels like they don't trust you, I see [understand] that they are afraid of strangers coming in because there are quite a lot of computers." (1177)

'They' become more known to individual users who have interacted directly with 'them':

> "[A]nd so what happened then they said, ok, put up a list over the doors you want to have the openers on [...]"
> - And who is it that you spoke to about it, I don't mean personally...
> "The department, or more specifically the administration boss". (694)

It is also somewhat easier to pinpoint who 'they' are when it comes to a specific environmental feature that 'they' would be responsible for:

> "They changed it a couple of months ago, now you don't have to put in the code"
> -And who is they?
> "Ummm, I guess the administration, or the security company or somebody. I am not sure." (837)

However, in general, while 'they' are often referred to, 'they' are rarely well defined or specific. In other words, users often experience 'their' presence but they usually don't have a clear image or definition ready of who 'they' are:

> "I guess they don't care that much.. ."
> - Who is they?
> "I mean, it is a firm, isn't it? The research park, it is sort of a company of some sort, probably publicly owned but... maybe some partnership or something [...] I don't really know...[...] it is a difficult question, I haven't

> really thought about it, it would be people responsible for creating the space." (607)

Sense of not being invited. Two experience codes were gathered under this category. The first one is 'experiencing the environment as uninviting':

> "[T]he stairs are not good at all, they don't invite you to walk on them, it is all these... I think it is the sharp edges everywhere... these are the worst." (605)
>
> "I feel like this is not a very cozy place. It does not have a feel like I want to come in and stay." (454)

A similar yet somewhat stronger experience is the 'sense of not being supposed to go somewhere':

> "You are not suppose to go that way [...] if you come from the side you see the stairs going up there to the open space that is clearly the main entrance and here is a corner, surrounded off and you can't see so it is obvious you are not suppose to go there, you can't see anything that way, it could be a dead end actually, you don't know. But that is enough to tell me you are not supposed to go there." (530)

These two codes are often inseparable:

> "[A]nd it is a short narrow hallway, it is nothing that invites you into it, it just seems like an office hallway, you are not supposed to be there if you know what I mean." (679)

However, I have developed these two codes as separate as 'the sense of not being supposed to go somewhere' was often clearly associated with being subjected to physical power:

> "[T]hey don't refrain from using physical power here so perhaps they say... everybody have to go this direction." (329)

No sense of belonging/feeling at home. Some participants said directly that they felt like they didn't belong somewhere while walking through or past a certain area. Other

phrased it as ‘not feeling at home'. These two codes were grouped together as they often co-occurred and carried similar meaning:

> “I never use this area, [...] it is a public space, it might be but I never use it, I don't belong here” (332).
>
> “[W]hen I am walking in the building I don’t feel at home here at all which is kind of what I think I would like, because I think that is one of the problems for this department is that they are located in so many areas.” (369)

Lack of engagement. A clear category of negative experience that has emerged from the data has to do with ‘lack of engagement’: it refers to experiences of spaces as boring or not exciting.

> “[T]his building I am not super excited about. I think it is quite boring.” (152)
>
> “When I come in here I always think it is boring, this easel, it is very often either empty or full of [information].” (1139)

Aesthetics. Negative aesthetic experiences such as encountering something as not beautiful or as ugly were mentioned directly very rarely. When participants did talk about these experiences, it was mostly in relation to the art located in the buildings:

> “The open space, I like the round shape of that, I like most of it, I don’t like what they call "the art" down there because that is very strange.” (720)

or the man-made environment in general:

> “So I come in through the corner door there which is not, I mean it is not the most beautiful invitation to the building.” (106)
>
> “I arrive here at not so beautiful stairs [...] I realized that this is shorter [...] I want to get to my office as quick as possible so then I end up here.” (841)

The first and last quotes indicate that users would choose a path despite the negative aesthetic experiences it was affording. I will talk more about the role that different

experiences play in path choice in further sections of this chapter. The fact that participants have not mentioned more negative aesthetic experiences does not necessarily imply that they have experienced the environment as aesthetically pleasing (see section on positive aesthetic experiences). Rather, the aesthetics of the environment might be 'transparent' to the participants or 'ready to hand', to use Heidegger's phrase.

Another, closely related code, 'not nice' seems to confirm this.

'Not nice' is a too broad a term to fit exclusively in any of the experience categories. Some of the 'not nice' experiences, such as this one, were categorized as negative aesthetic experience and discomfort:

> "[T]he elevator is also meant for things not only for persons so I think it is not a very nice elevator and it is kind of ...it might stop." (424)

However, depending on context, other 'not nice' experiences could simply describe a general negative experience of disliking something.

Positive experiences

There were significantly fewer positive than negative experiences associated with mobility that were mentioned by participants in the walk-through interviews. In general, the participants not only pointed less to positive experiences but also those that were mentioned were often verbalized indirectly. The participants would express a positive emotional reaction ('I like', 'I enjoy') and associate it with a physical or social quality of the environment but would refrain from describing the experience in detail. What is more, those positive experiences that were verbalized by participants were often associated with situations of rest when the participants were not walking. In other words, positive experiences were often associated with destinations or places where people paused. On the other hand, the rest places also evoked positive experiences when participants were passing through/by them and these, as such, fit into the main interest of this study.

Despite the scarcity of comments about positive experiences, I have attempted to conduct the analysis in the same way as negative experiences were analyzed. The positive experiences associated with mobility were coded with the following bottom up codes (starting with the most frequent occurrences): experiencing the environment as nice, open, and light which was often associated with being inviting and/or welcomed; positive experiences of mobility associated with social interaction; exploration and excitement about the new environment; positive experiences associated with nature or the aesthetic features of the environment, a feeling of being more effective in one's mobility, experiencing something as practical, having the possibility of learning about the socio-environmental context (usually through visual access or through social interaction). Other experiences only briefly mentioned by individual participants were: having choice over the path, feeling in the right place, engaging with the physical environment through play, positive experiences associated with frequent use ("I like it because I use it more"), pleasant ambience/coziness. As a next step in analysis, I grouped these codes in more general categories:

Figure 38. Categories of positive experiences associated with mobility. The categories are not exclusive and might intertwine in some of the codes.

Sense of being invited. This category includes the codes of feeling in the right place, feeling invited, and feeling welcomed:

> "Usually I go the reception area which is sort of ... [...] it is in a way welcoming." (1019)

The feeling of being invited was often associated with experiencing the environment as nice, open, and light:

> "In some ways, I feel that this is the place I am supposed to be because it is much more open, this is where I am usually going." (663)

Sometimes the participants only implied the feeling of being invited by pairing the basic positive emotional reaction with the environment:

> "I like this space. The main entrance is very light and airy." (627)

I discuss the role of environmental qualities associated with these experiences further in the section on configurational affordances later in this chapter.

Engagement. This category embraces two types of positive engagement. First is an engaging interaction with the environment, evoking excitement or allowing for *exploration* of a new environment or play.

> "I remember being at the boat to Denmark when I was young and we always went through all the emergency exit stuff, you are not allowed to do that but it has a small stairs we could get out to the engine and yeah, we used to always find these routes yeah, those walkways and I like that much better than the boring way." (583)

> "I used to practice [joggling] here in the evenings, because it is so... you can throw a ball really high up, so I like being here in the evenings, and joggle." (930)

Another code is *engagement through social interaction*. These experiences were referred to by participants more often. Social interaction is often a goal of mobility (going somewhere to interact with people):

> "Sometimes I come down here because I have a friend that works down there." (165)

or happens spontaneously:

> "I usually go somewhere here and stop, because there are usually a lot of people around here if there is a lecture or something." (780)

Sense of belonging. It is interesting to note that the sense of belonging is a weaker category of positive experiences as it has not been explicitly mentioned by the participants. Despite emerging clearly in the negative experiences analysis, this category did not emerge very strongly when analyzing the occurrences of positive experiences. Only one participant used the word 'home' when referring to the spaces that I studied:

> "Just run up the stairs and you are home." (580)

However, I kept this category as some of the participants have implied that the building afforded what can be interpreted as a feeling of being at home by pointing out that they feel more acquainted with the building:

> - You also mentioned that you like this building more than the other one...
> - "Because I used this building more." (500)

or by noting the "cozy" atmosphere as 'cozy'[9] is, according to The Oxford dictionary (2010), a synonym to 'homelike' and 'homey'.

> "Here is this room with coffee and soda... sort of cozy room with window blinds and pictures on the walls and stuff ... "
> - Do you come here on your way in?
> "Usually on my way in to work." (824)

In general, however, this category of belonging or feeling at home was rarely present in the coded data from the walk-though interviews.

[9] In colloquial Norwegian, the word "koselig" (which usually translates to "cozy") is particularly used and its meaning goes beyond English use of "cozy". See, for example "What Does It Mean to Be Comfortable?" (Koerth-Baker, 2013) for more on the uses of the word "koselig".

Aesthetics as a code category, on the other hand, has been expressed quite explicitly. The Oxford dictionary definition of aesthetics is "*giving or designed to give pleasure through beauty; of pleasing appearance"* (2010). Participants usually referred to the beauty of natural environments and rarely, if ever, to the aesthetic qualities of the man made environment or art:

> "[T]his thing is pretty cool, have you seen the snow? It's pretty amazing." (131)
>
> "[O]ften when I come here I look at the sky and that is very nice." (1043)
>
> "[S]o maybe once a day or something I walk around, just walk but then I walk outside, in the campus [...] it is a beautiful area here." (1053)

Agency. This is an important category that I used to group codes that had to do with participants positively experiencing having control over the environment, either physical or social such as, for example, having a choice of which route to take:

> "It gives you options, you can go that route or that route, you can hope to meet somebody, you can try to avoid meeting somebody, so that is nice." (326)

Making sense of and understanding the environment. There was only one occurrence coded within this category. I hypothesize that being able to understand becomes invisible. It is not a simple dichotomy of not being able to understand – negative experience, being able to understand – positive experience. At best, understanding is just experienced as neutral, remaining Heidegger's typology 'ready at hand' and thus not something that people mention. The one occurrence that fits into this category is particularly interesting as it shows how having the understanding of how the environment makes certain users more of what I would call 'mobility-privileged':

> "I usually just swipe in and go in but people I know sometimes just don't get into class because they don't have access. The thing is, if you really know the system you could try to go and open it, you can just wait here and after a while you can hear a clicking sound because someone moved and then it is open, but nobody knows about that so..." (667)

The environmental features that gave an overview over the socio-environmental context (usually through visual access or through social interaction) were, in particular, experienced very positively:

> "If I come [this] way around then I know that, ok, these people are there, these people are there, if I have any doubt I can just go and ask them so that is quite good." (498)

Being able to see has also been referred to as practical or useful. This also relates to experiencing comfort.

Comfort and Convenience. Participants did not refer to physical comfort related to comfortable noise levels, temperature, or smells. It is perhaps, as one participant mentioned, easier to notice when something is really bad or, in this case, uncomfortable; when it smells really bad or is really loud. The fact that there were no mentions of physical comfort may also be explained by the possibility that the environment did not afford positive experiences with these ambient qualities or that neutral experiences did not draw participants' attention.

Similarly, the state of psychological comfort was 'invisible'; once it was provided, it was not noticed. One could argue that it was taken for granted and not experienced as anything special.

What is worth noting however, is how strong physical comfort associated with bodily convenience is present in the data. Participants often indirectly related practical aspects of the environment to physical comfort since these practical aspects made their mobility more convenient and required less work from them:

> "This door, actually I think this is very practical that it is going that way, because when I go and buy coffee or something I can just push it open and I don't need to [pull]." (217)
>
> "I didn't like the locked doors in the beginning [...] but now I think it is quite ok because I don't have to lock my own office door if want to go for a coffee and I have money and so it is quite ok, because I go through my office door more often than through this door...so that saves me.... [time]." (411)

In other words, convenient environmental features (see the following section of this chapter for more on affordances) made it easier to move.

Emotional and behavioral components of positive experiences. As mentioned earlier, there were about half as many positive experiences as negative ones. Most of those noted above were associated with the categories of positive experiences mentioned earlier. Some, however, were just expressions of a simple fact that a participant liked or preferred something. A few people mentioned the feeling of being happy. I would categorize these as positive emotional components of experience. Moreover, going somewhere and 'spending a lot of time somewhere' were categorized under positive behavioral components.

Mobility goals, path choice, and hierarchy of walking needs

The analysis of verbalized positive and negative experiences does not address the issue of where people CHOOSE to go. As the next step of analysis, I examined the data through the lens of a general category of path choice. Choosing a path is making a behavioral choice preferring certain experiences over others. What is most important in this choice in the context of everyday mobility?

To answer this question, I first checked WHY people engage in mobility or what the goals of mobility in a workplace are. As the data reveal, there were two general groups of goals for mobility:

Goal: to reach a destination. Primarily, participants walked to reach a certain (psycho-social) destination such as:

- destinations that fulfill various basic needs such as getting food, drink, and using the toilet:

> "If you want to use the bathroom, then you walk there and if you just want to walk directly to the place then you just walk this way." (491)

- destinations where work (in its various forms) happens:

> "The mail is here, and the office supplies are here and the tax report is there so that's a lot of the reasons why I'm going there." (229)
>
> "When I just work I really need this inspiring mood of the environment and then I really move to the places where I can get that and sometimes that will be a coffee shop." (383)

- destinations that afford rest:

> "It is very informal, but it is good to have spaces outside of our research spaces, it is very good recreation, I guess a part of that we are very dependent on coffee is because we come for this kind of rest from the problems." (418)

- destinations that afford an aesthetic experience such as experience of nature:

> "I would go out here in the break, to have some fresh air, that was nice, especially in the summer or in the spring." (924)

- destinations that afford social interaction, either planned or spontaneous:

> "Sometimes I come down here because I have a friend that works down there." (165)
>
> "I usually go somewhere here and stop, because there are usually a lot of people around here." (780)

Mobility as a goal in itself. Sometimes walking (or mobility) can be a goal in itself:

- as it, itself, affords a shift in an experience

> "Walking can be a goal in itself, sometimes I would just go around just to stretch my legs [...] I like it that it is a round space so that you can go without going back the same way." (261)

> "Sometimes I walk around, just walk, but then I walk outside, in the campus [...] to get some breathing space, to calm down, to be more simple, if I am dealing with a lot of things.. I prefer [to go outside] usually instead of sitting in a chair, it is really nice to walk." (1048)

- as it provides physical activity

> "I take the elevator upstairs but go down the stairs. I don't like going up the stairs but I go down the stairs to get some activity." (1069)

- as it affords an overview and control over the environment

> "If I come the other way around then I know that, ok, these people are there, these people are there." (498)

- as it engages

- with the physical environment through, for example, play

> "I used to practice [joggling] here in the evenings, because it is so... you can throw a ball really high up, so I like being here in the evenings, and joggle." (930)

- with the social environment, affording socialization and community building

> "I try to come here, I don't really have an agenda, but I try just to chat, I don't really think anyone knows who is in a group and who does what. So sometimes I come here when I come in, and this is a dead end so I have to go back I come here to see who is in and who is not, is there anybody new here because people come and go." (594)

In general, it can be stated that the positive experiences associated with mobility (as categorized above) can become a goal in itself. One can walk just for positive aesthetic experiences, for a positive engagement with the physical environment, or to be with people, to gain a control over the environment.

To conclude, it is the goal, or goals that to a large extent dictate the paths of everyday mobility. We can have one main goal such as let us say, going to the bathroom, and some side goals. For example, putting on water for tea and passing by a large window to take a peek outside.

Path choice and hierarchy of walking needs. So how do we choose the paths depending on the goals? If we are going to a destination, is it more important to get there in the shortest time? Is it perhaps the shortest distance that is most important? Or maybe we prefer a path with the best vistas instead?

Obviously, there is no single answer to this question as the choice can be determined by a multiplicity of other factors; and while the goal may be the main one, others that influence this decision include how much time one has, if one is walking with someone, the weather, the person's mood etc.

The complexities of these motivations are not the main topic of this study. However, there have been some patterns emerging from the data that seem important in the context of what experiences mobility provides. For destination-oriented mobility, perhaps not surprisingly, it was most important to get to the destination in a most time effective manner (emphasis added in bold type):

> "First of all I usually use this entrance, because **it is time saving** because I always come from that side." (062)

> "I take this entrance when I come from Forskningsparken. **It is all about saving time**. It is important to save time but it still has to be a comfortable route. Maybe you need to balance that. "
> - What is comfortable for you?

> "Not so much noise and things that will delay you, like big masses of people or something on your way like a truck or something that you have to go around..." (64)
>
> "I am always thinking **time consuming**... where is the most ...fastest route to get downstairs and I think it is this one." (68)

The most time effective way would sometimes mean a longer (in a metric sense) path but a more convenient one with fewer barriers that have the potential to impede mobility. Over and over again, participants confirmed that, when presented with alternative paths, they would choose the path that they perceived as one that would get them to their destination more quickly even if this meant taking a longer path:

> "I prefer the way without the doors, it is a little bit like the taxi drivers, they don't always take the shortest route, they are supposed to do it, but often they prefer the routes without the traffic lights." (82)

In other words, there is a trade-off between the length of the path and the work one has to do to get through it. How much longer of a path are we willing to take to avoid the barriers or extra effort? And how much extra effort are we willing to accept to avoid going a longer distance? Clearly, individual differences have a lot to say in path choice:

> [I]t depends whether I go alone or if I go with XX, because I think he likes to take the elevator whereas **I would mostly go the fastest and the shortest way** through the stairs (257).

This study was not designed to directly address these questions but it would be interesting to take up these issues in further research. Also, there have been a number of studies addressing the issue of perceived distance (see Gärling, 1999 for a review of the studies) and I refer the reader to those. But even though I leave the answer to these questions open to further investigation, a hypothesis about walking needs emerges from a very clear pattern in the data.

One very evident and consistent pattern that cannot be overlooked has emerged in the data. When it comes to entering the building, participants at all three locations would choose entrances that were closest to their outside path (either from public transportation or their walking route) because they felt that it was quicker and more effective. The entrances chosen were often not the main entrances but rather back-door, emergency, or delivery exits/entrances that just happened to be by their transit routes. Participants would still use them even if these entrances required more work from them and it was a lot more 'hassle' (taking out a card and swiping it to unlock the door) to take them rather than the designed paths through the main entrance. This inconvenience did not add enough to the experienced distance for the users to choose the alternative path through the main entrance:

> "Well, as you probably know, the main entrance that everyone uses is in the garage. Right, um. So I come in through this door but it is always a hassle, it is always a little stand off to see who take out the card especially in the morning when it is really cold then you just wait for someone to take out the card. [N]ormally when you come in with your gloves and everything you have to fish up the card and dial the code and... it is always good to be behind someone yes." (176)

What is more, the paths that were used were often quite unpleasant, accompanied by the bad smells of garbage and fumes (the path through garage), vistas of dark spaces, old equipment, and even garbage or other, as some participants noted, aesthetically unpleasant views. In other words, participants chose the closest entrance despite all the unpleasant experiences that came with the paths they chose.

I hypothesize that, for destination-oriented mobility, the experience of effectiveness in one's mobility constitutes a meta-category associated with the three codes: understanding of the environment, convenience, and agency. In other words, the accessibility of the destination and the path leading to it depends on understanding the environment and its rules, having the feeling of agency over one's mobility and its effectiveness as well as the

convenience and comfort of the path including the actual and perceived distance. The other four categories, namely: sense of being invited, sense of belonging, engagement, and aesthetics are of secondary significance. The feeling of being at-home is of secondary importance when one faces the 'hassle' of inconvenient access or the aesthetic experience of a confusing path seems of less significance when the participants are not able to reach their destinations as in this ironic comment offered by another participant:

> "First of all we are very well hidden but it is nice art on the wall [smirk/laughter]." (110)

It is of interest that, on the other hand, for mobility that is not destination oriented, effectiveness is of less significance. That is not to say that users will willingly chose a path that is frustrating because of the multiple barriers when walking for pleasure. I would rather argue that, in path choice for non-destination mobility, other experiences such as aesthetics, engagement, belonging, or feeling invited sometimes appear to have become of greater significance and in this way became goals/destinations in themselves.

Affordances identified

The following section is devoted to describing the affordances I identified throughout the analysis of qualitative data. Each affordance consists of the physical component and the coupled experience described. The affordance described is sometimes accompanied by a photo (when available from the data as provided by the participant) or a fragment of the building's layout. I also quote participants' accounts at length, providing insight into the data from which the findings have been derived. Some of the affordances will be perhaps very intuitive and the reader might recognize them from his or her own experience. Some have been noted in the environment-behavior literature before, which I reference in the conclusion section of this chapter. Other affordances might be more

uncommon. Again, the idea here, which is consistent with my overall research goal, was to identify a possible *array* of affordances for diverse users so the assumption is not that all possible users will experience the affordances in the same way but rather that they might surface for specific users. The designer's role however, is to take the possible multiplicity of users and their experiences into account when designing spaces.

Figure 39. Service entrance that was used by all the participants that arrived from this side of the building.

A1. Closest entrance to the outside path affords use regardless of whether is it designed as main entrance or not.

"First of all I usually use this entrance, because it is time saving because I always come from that side and I don't think this is supposed to be an entrance but it is for… so yes I usually takes (62)

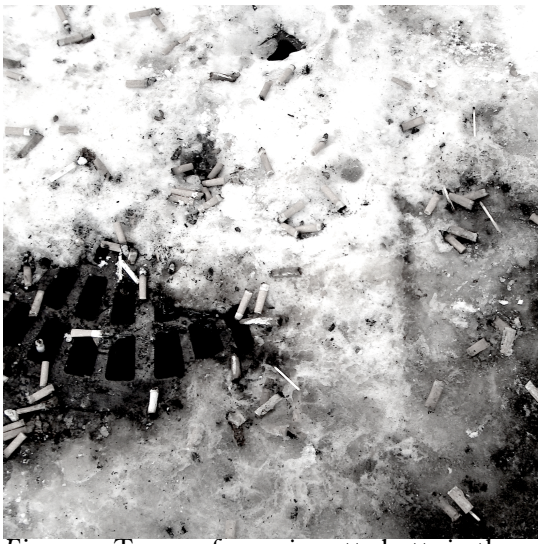


Figure 40. Traces of use: cigarette butts in the snow by the entrance.

A2. Outdoor entrance area, despite clear signage that it is not allowed, affords gathering and smoking cigarettes (behavior) and in turn affords discomfort and basic negative reactions in passersby.

"And this is not a particularly nice area because people smoke here, and it smells bad, but I usually go this way anyway but at this point I start to walk faster because I want to pass more quickly." (855)

A3. Indoor entrance areas lead a user to expect the possibility of understanding and making sense of the environment and its rules. The entrance area should allow for visual access providing an overview of the different parts of the building to afford this 'sense making'.

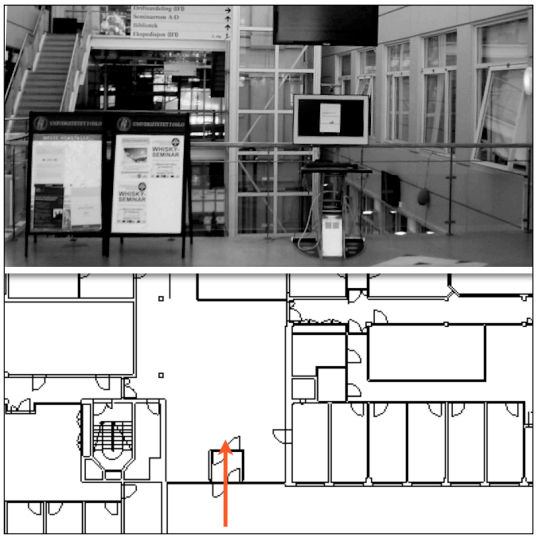


Figure 41. Entrance area should afford an understanding of the environment. As a user enters the building (as represented with the red arrow) she does not see where the administration office could be. The user finds it difficult to make sense of the environment although there are signs to direct her. The user's expectation is to be able to have visual access to the different parts of the building that would allow for making sense of the environment.

"Sometimes when things are easy to find, you don't need signs, but here it is not so easy to find. This is the administration, I think this is a very important part, maybe it should be in some more visible place because lots of students go there a lot of time so it should also be nicer, and it is also nice to have all this information right at the entrance, where you can ask."
- When you came here to the administration, did you feel it wasn't so visible?
"It was not so hard to find, but it was not there where you would expect, at the entrance, and usually in a university administration is the first thing you see." (982)

A4. An indoor entrance area leads a user to expect an open space and not, for example, stairs or other strong elements. Open space with visual access in the entrance area affords making sense of the environment.

Figure 42. An unexpected design of the entrance area. The first vista a user sees when entering building 2. The stairs lead to upper floors where most of the offices are located (but no clues are provided for the user to know that). Below, a user sees a sitting area in the building's atrium

I sort of feel that this is a strange entrance of the house [building]. You walk straight in and then you are met by a stair like this.
-And why do you think this is strange?
"So normally when you come in... I mean that is the reception but you can't see, you just walk in here and you are met by the stairs. It was a little bit... I don't know if confusing is the right word. I mean it still puzzles me because I don't think it is particularly good layout [...] I mean it just comes this door, what may be a "strong" entrance directly to the stairs and I mean normally one assumes that you can enter a room which is more like... you can sort of more see the reception." (179)

A5. Stairs can afford mobility that is associated with effectiveness.

- What is the reason for you not to take an elevator?
"Well it is not any health issues it is just that I feel more comfortable going [up the stairs]than standing still, it feels like I am spending more time standing in the elevator I want to be moving forward and the stairs allow me to do that. Sometimes it is like it is better to be moving slowly in traffic than standing still even if in total it doesn't get you further." (402)

"Sometimes I take the elevator but most of the time I don't because there is lots of people coming from the subway and so generally one of the elevators have just left and the other one is about to come down and it is more efficient to just take the stairs. But I do wait here if I am lazy or whatever." (509)

A6. Open stair treads can afford anxiety and discomfort.

Figure 43. See-though stairs that can afford discomfort and anxiety

"See I like to take the elevator, because I am afraid of heights and so I don't like to take these stairs because I feel very uncomfortable and..."
- Does it have anything to do with how the stairs are?
"Yes, I think it has a lot to do with how the stairs look because you can see through them and that makes it worse and obviously, if it wasn't see through I could probably go in the middle like this but then its all see through and I hate, I always hate that when its high up so I think it's got a lot to do with that" (252).

A7. The complexity of the layout along with the large size of the building affords less understanding of the socio/environmental context and thus less engagement .

> "I would always go though the stairs and I would go through the *kantine*. It is only after being here for like six months or something I discovered that I could go through the garage. So I don't know if that is a testament to my foolishness or to just that the building is not very..." (171).

> "It's kind of a confusing building, because it is kind of big, you don't use that much of it and you kind of don't know what is happening in the other corners of this building."
> - Why do you think that is the case?
> "Maybe because people don't want to tell... I don't know but eh, they should because it would be a more interesting place... I have been a student for a long time and I still don't know what is happening in this building." (79)

A8. Circular paths afford use (behavior), in particular mobility that is not destination oriented.

> "Walking can be a goal in itself, sometimes I would just go around just to stretch my legs, I don't think I do it very often but I like it that it is a round space so that you can go without going back the same way so that certainly changes my routines because I don't like to be walking the same way back and forth if I am going for like the " trip", maybe I'll go that way and then out and then in the same way, so to get like a roundtrip." (261)

A9. Sharp turns add to the experienced distance and thus affords less effectiveness.

> - So why do you consider this being shorter?
> "Eh, I don't know. Because it [the other one] is too ... it has a really sharp turn and you have to go [straight] and back." (68)

A10. Spiral stairs add to the experienced distance and discourage use as compared to straight stairs (even with a sharp turns) as they afford less effectiveness.

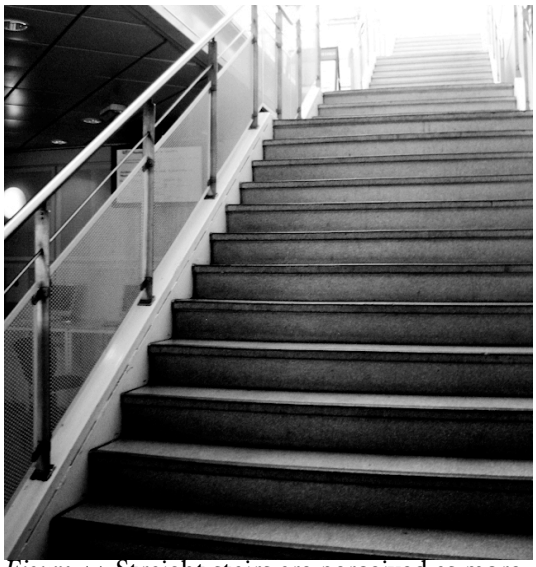


Figure 44. Straight stairs are perceived as more effective than spiral stairs.

> "But you know it is not the round stairs so it is much more effective, efficient just to walk up and down, not the large... these are just plain stairs, just run up the stairs and you are home."
> - And you can't run the other stairs?
> "No. You can't really. So these are more efficient stairs." (578)

A11. Structures with visual access afford the sense of being supposed to go somewhere/of being invited.

> "You HAVE to go this way [up the stairs], you are not supposed to go that way that you can't see,"
> - What is it about what you see, that makes you think you are not supposed to walk there?
> "If you come from the side, you see the stairs going up there to the open space what is clearly the main entrance and here is a corner, surrounded off and you can't see so it is obviously you are not suppose to go there, you can't see anything that way, it could be a dead end actually, you don't know. But that is enough to tell me you are not supposed to go there." (529)

A12: Structures with unobstructed vistas (such as a staircase open to an atrium or larger area) afford control by learning about the overall the socio-spatial context as well as allowing one to regulate social engagement

Figure 45. Unobstructed vistas afford control over the socio-spatial context and allow one to regulate engagement with other people.

"[A]t this point I am looking at are there are any students waiting for me [downstairs], usually that door is closed so I have to get my card to get in so at this point I am checking, now if there are no students either they are all inside or they haven't showed up yet, which is the most likely, so then I am walking down here."
- You mentioned that you are looking down to see if the students are there ...
"Yes, it is practical ..." (912)

"At this point I am always checking who is in the *kantine*, of course, if there anyone I know, I never take a detour but I am preparing, to say hello or not to the people in there." (875)

A13: Design that allows for being observed by others affords discomfort for those being observed

Figure 46. If the design allows for being observed by others (as here by people passing by the building) it affords discomfort for the users of the building.

"When people walk by over [outside] there I feel like perhaps a little bit like in an aquarium, again. Swim around down there" (297).

"I like the elevator. The only thing is that I feel self-conscious looking in the mirror because the back is glass so people can see doing that, it is tricky...." (105).

A14. Light is experienced as an invitation and is, in general, aesthetically pleasing. Dark spaces afford the feeling of being uninvited or a sense of not being supposed to go somewhere.

Figure 47. Dark areas afford feeling of being uninvited. Light, on the other hand, affords invitation.

"Here it is always so dark, it feels like it is a space that is really out of the way and sometimes you feel like you should not be here because the lights are off" (1158).

I think it is nice when there is a lot of light coming in, and there is more light comparing to the other building also maybe because of the high ceiling and also maybe it looks a bit more modern (449).

A15. Openness affords invitation, positive emotions, use, and at-homeness. Narrow, enclosed, and embedded spaces are not inviting and afford less use and less acquaintance with space (sense making).

Figure 48. Open spaces afford invitation.

- You also mentioned that you like this building more than the other one...
"Because [...] this one here is much more open, you can see things and that [other one] is like a basement, and you really don't see that much outside. This one is much more open." (500)

"I actually like this area [...] Because of its openness, light. I meet a lot of friends, so it is exiting. I spend quite a lot of time here [...] I think this is the heart of the building." (23)

"I always go to cafeteria that way, and down here to buy lunch and then I go round it might be the same distance, it is just that this is much more open, and just feels the right way." (661)

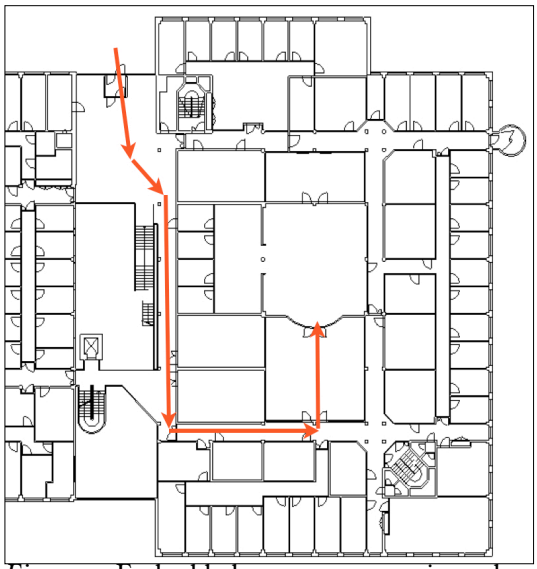


Figure 49. Embedded spaces are experienced as less inviting, afford less acquaintance and less use. The red line represents the way in into the library.

-What are your impressions of this hallway?
"It is ok, for those who should go to their offices but not to the library we are too hidden in the building."
- So what you are saying is that it doesn't direct people to the library?
"No! So I don't know what the architects thought of, I didn't work here when they planned it but I don't think they thought about students and visitors." (1091)

"Before [...] I didn't know about this place at all. It is a bit hidden." (1152)

"I think this hallway appears as if it not very often used. The library is very hidden. I don't think that many bachelor students know about it." (1166)

"And it is a short narrow hallway, it is nothing that invites you into it, it just seems like an office hallway, you are not supposed to be there if you know what I mean." (678)

A16. In general, places where people gather invite and attract other people. People attract people.

> "I usually go somewhere here and stop, because there are usually a lot of people around here if there is a lecture or something." (780)

A17. As openness and light can afford the gathering of people it might simultaneously afford feeling uninvited and uncomfortable if the formal or informal groups gathered leave little room for passersby.

Figure 50. Though open and light the hallway affords in passers-by feelings of being uninvited if there are people gathered in the space.

"Here you have a feeling of ... it's a wide room and it's light here, in this open room here which makes it feel like it is more spacey, but if there is a meeting going on there, if a group sits there I feel like an intruder in a way, because they feel very close to the... so then I just hurry past [...] but it is kind of disturbing that you can feel... [When you go] past a congregation where I don't belong in a way." (287)

A18. The natural environment evokes positive emotional and behavioral reactions (can serve as an attractor for mobility).

Figure 51. View from one of the hallways. View of the natural environment evokes positive emotions and can serve as a mobility attractor.

"This thing is pretty cool, have you seen the snow? It's pretty amazing." (131).

"Often when I come here I look at the sky and that is very nice." (1043)

"I would go out here in the break, to have some fresh air, that was nice, especially in the summer or in the spring, that was nice, that was a nice place to, you know, hang out." (924)

A19. Availability of multiple path choices gives a sense of agency and affords regulating social engagement.

> "[I]t gives you options, you can go that route or that route, you can hope to meet somebody, you can try to avoid meeting somebody, so that is nice" (326).

A20. Back ways and emergency exits can afford engagement and excitement because the are hidden and allow for exploration.

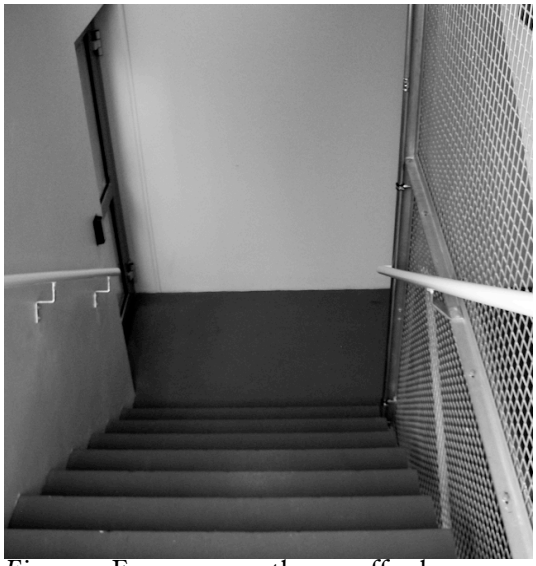


Figure 52. Emergency paths can afford excitement because of their assigned meaning.

– So in a way the emergency exits are different because you are not supposed to be there? Is that where the excitement is coming from?
"Yeah, I think so, that's why I like the strange stairs down to the parking space" (585).

A21. A closed door is uninviting, affords a barrier to walking as well as experiences of discomfort and inconvenience. To a large extent, it is the user's body that determines to what degree door is experienced as a barrier. Open doors, on the other hand, afford the feeling of being invited. Doors that match tacit bodily knowledge [10] are experienced as convenient.

Figure 53. Door affords a barrier on multiple levels of experience.

"That is kind of a strange area because it is kind of three doors and I never understand it but I always go left because that is only one door. I prefer the way without the doors, it is a little bit like the taxi drivers, they don't always take the shortest route, they are supposed to do it, but often they prefer the routes without the traffic lights." (82)

"I think the *kantine* is not so inviting, because the door is so small and it is a very closed area. And,

[10] Tacit knowledge is the knowledge that is not explicit or easily verbalized. See p. 116 for further explanation.

with the closed door, it is even more closed, and even when I know it is open." (1181)

Figure 54. If the door constitutes too much of a barrier users will find 'workarounds' such as bins, chairs or any other objects that can keep the door open.

"[S]ince the door is locked and everyone has to have a key to get in, and sometimes [...] you want to make some coffee, and your hands are full, and then you really don't want to use your swipe card, just for 5 minutes, it is always good just to have it open, and what do you then... the nearest thing is the dustbin." (479)

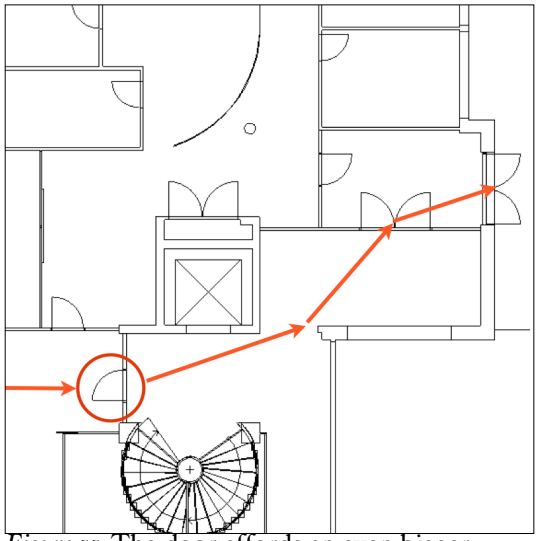


Figure 55. The door affords an even bigger barrier in the context of a user's body. One example is the direction of a door that does not correspond with the tacit knowledge carried by the body (or affords a different opening direction). Another example is when the body is in some way impaired temporarily i.e. by carrying something or permanently as for some wheelchair users.

"[The door is] going a wrong way, X usually makes fun of me, because she says, I can't read the sign because it says [pull] or [push] but I always do the wrong thing. So she is making fun of me whenever I use that door."
- And why do you say it goes the wrong way?
"I don't know, maybe it is something with, that if you are here [on the inside] this goes that way and so this should also go that was. Because [the door] goes the wrong way for me. For exiting the building I want to push the door. I see the sign there but I always do the wrong thing [...]. My natural reaction is to pull the door when I am coming in. I think maybe I dislike it because when you look at it is not obvious which way it is going. [S]ometimes you can see what way the door is going." (218)

Figure 56. Door opening the way that corresponds with the tacit bodily knowledge and user's needs.

"This door, actually I think this is very practical that it is going that way, because when I go and buy coffee or something I can just push it open and I don't need to [pull]." (217)

Figure 57. Open door is inviting.

"[It is] inviting because [the door is] open. It looks inviting because of the light" (46).

A22. Doors made out of solid materials that don't provide the users with visual access afford the feeling of not being invited.

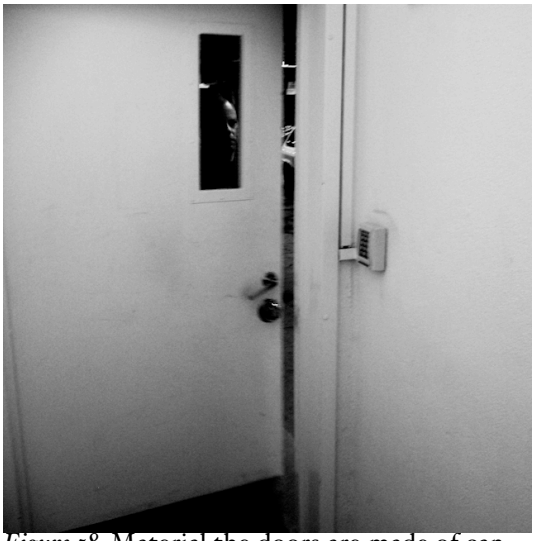


Figure 58. Material the doors are made of can afford the feeling of being invited or not.

"I choose to take the stairs [that are behind these doors] because I know about them. First time I wasn't sure I could see that the door is not really... the way you are suppose to go" (562).

A23: Lack of access affords frustration. Being subject to layers of access control through, for example, technology embedded in the physical space such as card readers, affords more frustration, psychological discomfort, feelings of being less effective, and confusion. In particular, ambiguous regulation of access affords the feeling of less agency: being subjected to power and not having a path choice. It also leads to basic negative emotions such as anxiety and frustration and basic behavioral reactions such as avoidance.

Figure 59. This door is locked.
Not having access affords frustration caused by ck of agency.

"This door, there used to be access, but they made it inaccessible. I was really irritated, because before I got access to this door." (42)

"It is always a little stand off to see who take out the card especially in the morning when it is really cold then you just wait for someone to take out the card [...] well, normally when you come in with

> your gloves and everything you have to fish up the card and dial the code and... it is always good to be behind someone (174). But it is also strange that you have to have a code to get in even on a regular day. It makes it so much more hassle to get in. Not only you have to swipe your card but you also have to put in your code, but it seems that there are a lot of places that you have to punch in your code." (673)

Figure 60. Embedded technology regulating access can afford a whole array of negative experiences.

> "I don't know, for instance I know that that door, you need your card after 4.30 but does something happen at 7 at night or 12 at night. I don't know, I have no idea, is there some other system, I don't know, and I am not quite sure if my card has all the rights, all the approvals... [...] And this is perhaps why I feel it is unstable. Nobody told me, I have NO IDEA how it is suppose to function. And so I feel there is a slight risk of staying here at night." (333)

> "I don't really feel comfortable with one, two, three boxes, what I understand them as mechanisms for identifying the persons that are coming in [...] and as an entrance point is it evoking a lot of feelings about what an entrance to a building is. And this is about modern entrances in general" (1008).

The key experience here is lack of control and agency. This set of affordances is the strongest affordances identified. The array of negative experiences associated with the lack of or multiple layers of access control has been present in almost every single interview. Users have no control over where they can go and often do not understand the rules governing access. It leads to a multiplicity of negative emotions, less use, and, in some cases, resistance against the often unknown "them" (see paragraph on control earlier in this chapter).

Conclusions and discussion

The array of affordances expanded

Some of these findings, though perhaps not directly noted as affordances in the literature before, find confirmation in studies on human path choice in built environments. For example, for affordances that refer to path choice and distances perceived (A1, A7, A9, A10, A21) research on experienced, or cognitive distance is highly relevant. Cognitive distance refers to "*people's beliefs about distances between places in large-scale spaces, places which are far apart and obscured so as not to be visible"* (after Montello, 1991; p. 11). A number of studies have shown, for example, that people perceive straight paths as shorter than those not straight. This study has identified other environmental features that constitute potential barriers and that add to experienced distance. Although no quantitative conclusions can be drawn from these findings (that is, it is not possible to generalize how much experienced distance increases when for example, a door is added to a straight path) these affordances have been identified and are open to further, more quantitative inquiry.

Other affordances are relevant to the Space Syntax tradition of studying movement in the built environment. In particular, the affordances that refer to the openness of spatial structure, embeddedness of spaces (A15), and visual vistas (A12) are directly relevant to the measures employed by Space Syntax methods that study them in the context of human movement. What this study contributes however is not only *how* these affordances influence behavior but also *why* they do, namely what experiences they evoke in users. What is more, this research also identifies other environmental qualities that mediate the experiences spatial structure affords.

In addition, some affordances identified in this study are supported by design research in domains other than mobility. For example, the affordance on sharp versus curved turns (A9) is supported by research on contour bias in object preference (Bar and Neta, 2006; Lidwell et al., 2003) and the affordance on excitement from exploration of

hidden and less accessible areas (A20) might correspond with the preference for mystery identified Kaplan et al. (1998). Similarly, a number of affordances discussed are analogous to some design guidelines that, although not directly referring to mobility, deal with similar experiences as those described here. In particular, one can find multiple parallels to some of the guidelines provided Christopher Alexander and his colleagues in "A pattern language: towns, buildings, construction" (1977). The authors describe, for example, the experience of 'being in a fish tank' that was discussed here in affordance A13 in relation to the uncomfortable feeling of being visible to others as one walks through spaces of high visual access. Alexander and his colleagues also discuss in much detail the importance of indoor sunlight (pattern 128) that this study briefly identified as an attractor for mobility (A14).

Although a detailed comparison of the findings of this with the rich material provided in 'The Pattern Language' is beyond the scope of this dissertation I do return to this work later in the closing chapter of this dissertation.

Experiences of mobility as compared with Seamon's taxonomy

Some of the experience categories identified in this study correspond directly compared to David Seamon's 'place ballet' qualities as for example, 'comfort and convenience' (Seamon's 'comfort') and 'sense of being invited' (Seamon's 'invitation'). Other categories have their more distant counterparts in Seamon's work: the category 'sense of belonging/feeling at home' is related to Seamon's category of attachment. I would also argue that the category of engagement could be loosely compared to David Seamon's diversity of uses category ('diversity').

On the other hand, sense making and agency do not have direct counterparts in Seamon's taxonomy. His category of distinctiveness or "*a sense of identity that makes it distinct from the larger environmental context"* only partly matches with my identified category of sense making. I have defined sense making here as being able to perceive and understand the

environment and the rules governing it. As identified in this study, some of the environmental affordances enable and some mis-affordances (Heft, 1997) disable these perceptions and the understanding of the environment. The sense-making category relates to the work of Rachel and Steven Kaplan (1998) who argue that we prefer environments that are easy to understand but that also support exploration. Understanding the environment is dependent on two environmental meta-qualities, namely coherence and legibility. Coherence is the clarity and order of elements and form and legibility is information that the environment provides on whether *one could make one's way through a setting* (Kaplan et al., 1998). In line with the Kaplans (and later, Evans and McCoy, 1998), I would argue that sense-making of the environment is a crucial component of everyday interaction with the environment specifically in the case of everyday mobility. As I have discussed previously, the dominant discourse in spatial cognition focuses almost exclusively on situations of mobility in new, unknown environments in which wayfinding takes place. This study has shown that emphasis needs to be placed on cognition as sense-making in everyday mobility in not-so-new yet perhaps not-entirely-known environments in which our everyday mobility usually takes place.

Agency is another experience category that has emerged as very significant in this study that does not have a direct counterpart in Seamon's conceptualization of a place ballet. I define agency as a sense of having control over the environment while on the move. Conversly, I understand having a sense of being subjected to some external power, not having control, or being policed in one's movements as not having agency over one's mobility. This corresponds to a large extent to control as understood by Evans and McCoy (1998):

> [M]astery or the ability to either alter the physical environment or regulate exposure to one's surroundings (p. 88).

My notion of agency as referred specifically to mobility encompasses also the sense of not being subject to some external power in terms of regulating one's movements in an environment. Agency (and control) has emerged as a very strong category of experience from these data. Although it has not been present in literature on mobility, it has been an important concept in the general environment–behavior literature. From a more classical psychology perspective, lack of agency and control over the environment in general has been shown to have a significant impact on people. Evans and McCoy point out what Cohen et al. (1986) state, namely that lack of agency can lead to what has been called 'learned helplessness'. Learned helplessness is a motivational, emotional, and cognitive inability to act learnt from previous actions that led to uncontrollable results. Simply put, if our actions have no effect on an unpleasant environmental stimulus, we learn not to act on them and become passive subjects to environmental conditions even if potentially, later on, we might actually influence the unpleasant environment. Learned helplessness has been shown to lead to frustration, distress, and even death in animals and humans (Abramson et al., 1978; Hiroto, 1974, Seligman and Beagley, 1975).

In the face of the increasing presence of technologies of access that users do not understand this 'learned helplessness' can pose serious problems. As one attempt of gaining control, users might learn to avoid it by choosing other paths, walking less (for example, not going to get a coffee because one doesn't want to experience the barriers on the way) or using the building only at certain times when access is not so regulated. Another scenario is that they surrender to the technologies of access without having a sense of control over them. This can lead, as shown not only by the multiple studies on learned helplessness, but also by this research, to distress and frustration.

From the critical theory perspective, the agency of mobility is interrelated with power relations and the social production of space (Lefebvre, 1999). In this study, as noted earlier, power was symbolized by 'they' and participants experienced being subjected to 'them' who controlled access and the environment in general while users had little overview,

understanding, or influence over the politics of access. Usually, a number of actors are involved in the production of access and mobility in modern buildings from architects, administrators, facility managers, and security departments to increasingly more centralized IT departments responsible for overseeing the technologies of access. Sometimes, the mobility production, or how the socio-economic context and power relations influence the way we walk, can be very explicit. A good example is given in the following informal interview by one of the architects responsible for designing the new building. Here he explains why he put an entrance on the on the side of the building furthest from to the public transportation routes:

> "Well, I just thought that if I design it as a main entrance, the users would use it."

Clearly, having the authority to make design decisions allowed the architect to make the main entrance at this specific location thus funneling the user's flow in a certain way. However, usually this sort of mobility production as a form of social control is not transparent to end-users. As experienced by the participants in this study, mobility and access production was most often experienced as both non transparent and not comprehensible. In other words, the users experienced being subjected to mobility regulation but did not have a clear sense of who was regulating and policing their mobility. Yet, following De Certeau, one could argue that users resist the power embedded in the physical space by choosing alternative, more convenient paths – just as they do when choosing the closest entry point and not the one designed as main entrance (A1).

The importance of the agency category is twofold. The first implication is methodological, namely to repoliticize the phenomenological perspective on mobility. As this study has shown, being subject to power embedded in the socio-physical space is part of our everyday mobility and it should not only be conceptualized from a critical theory perspective but also from within the paradigms that study human experiences of space.

Secondly, a more applied implication arises from this research and, in particular, from the finding on the crucial role of agency in mobility. The implication here is a critique of the rising trend toward 'smart' houses and smart office technology that has been gaining popularity in recent years in the western culture of modern facility design and management. The embedded technology that is often employed in these 'smart' buildings under the name of helping the users, in fact, takes the sense of agency and control away from them. This should be problematized not only in terms of the politics of access and space production but also in the context of users' distress and well-being.

To sum up, both sense making and agency seem to be supplementing Seamon's taxonomy of mobility experiences. I return to this point in greater detail in the closing chapter where I incorporate the findings of the participatory design methodology.

Initial affordance-experience model. The affordances identified can be grouped accordingly to the experiences with which they are coupled. The following figure presents the couplings with mis-affordances (or affordances leading to negative experiences – Heft, 1997) in regular font and affordances associated with positive experiences presented in bold font).

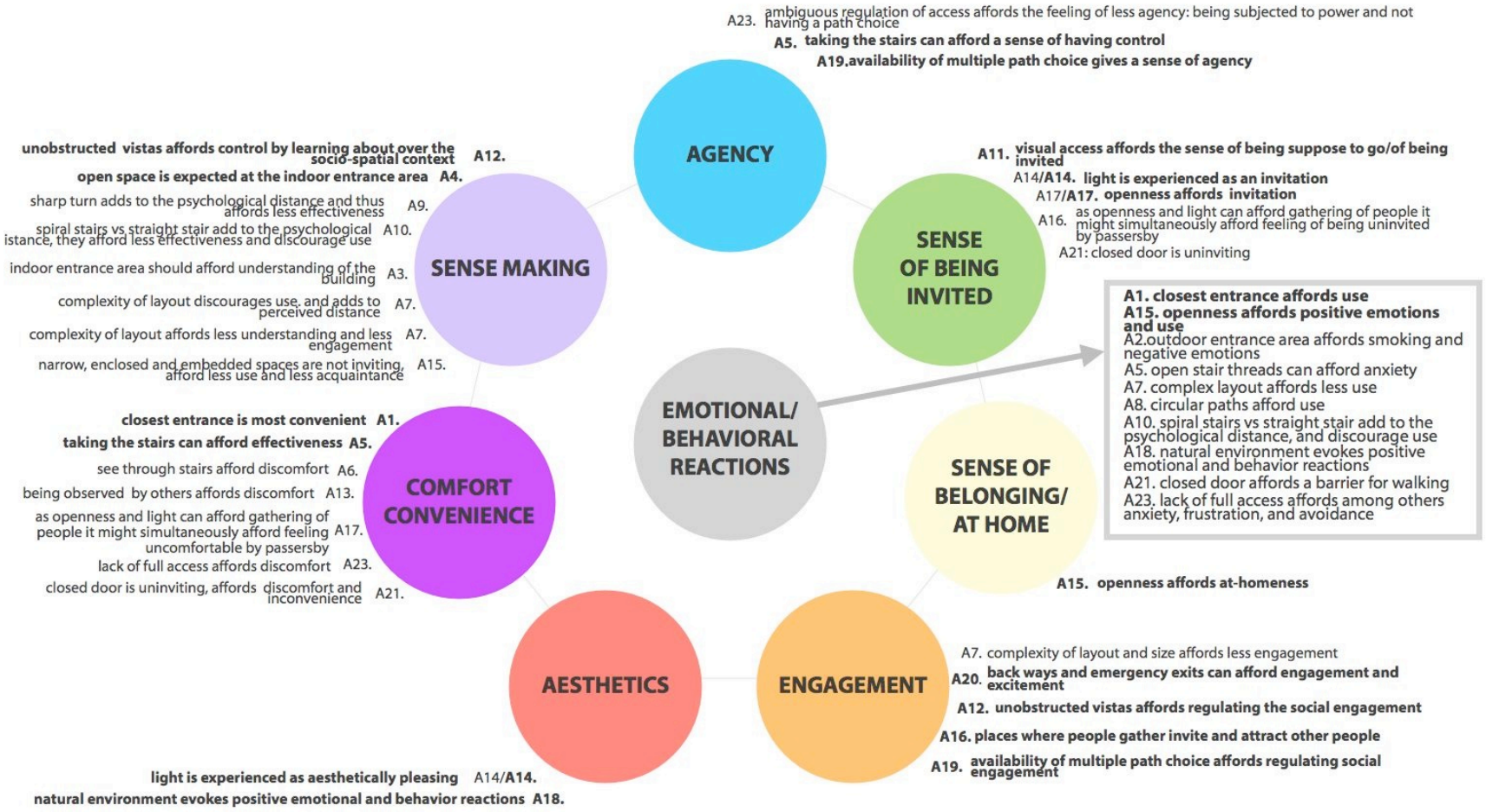


Figure 61. Identified categories of experiences coupled with affordances. Affordances listed in bold are associated with positive experiences and in regular font – with negative ones.

Chapter 6

Participatory design of affordances for mobility

Participatory design of affordances for mobility

Participatory Design (PD) is, next to Space Syntax and phenomenologically oriented ethnography, the third of the methodological approaches that I employ to address the research question guiding this dissertation. While PD is a recognized modality of design, its use as a research methodology has not been widely acknowledged. Therefore, after discussing the reasons for employing PD and its theoretical grounding, I devote a substantial section of this chapter to introducing PD as a research methodology. Next, the Future Workshop method is presented along with details on how it was conducted. I describe each of the four phases of the workshop and then review the findings of each phase. Just as in the previous chapter, each affordance is presented with an accompanying quote. Based on the findings from the workshop, I revised some of the affordances identified earlier. New affordances have also emerged. This chapter concludes with a discussion section and a new iteration of the affordance – mobility experience model developed in Chapter 5.

Rationale for employing participatory design as a research method

My motivation for conceptualizing the subject of this dissertation as affordances for human mobility has been influenced by the fact that there has been few design recommendations derived from research on the topic of mobility (as I discussed in Chapter 2). Though there is substantial research on mobility itself and, in particular, a very specific type of mobility, namely wayfinding, little if of it has led to specific design applications. This so called 'gap' is not unique to research on walking but has been an issue for environment-behavior research for years now (see for example Becker, 2007; Felix, 2010; Sailer, 2007; Vischer and Zeisel, 2008).

It has been argued elsewhere (Sanoff, 2000) that, in general, the behavioral research model that separates research and application has not been very successful in facilitating

collaboration among researchers, designers, and planners precisely because of this separation. PD has been proposed as an alternative research and design strategy to overcome this failure of environment-behavior studies. What is more, PD, though not previously employed in research on mobility, has been argued to have a potential to complement phenomenological approaches in the study of the human experience of the built environment. In particular, Saegert (1993) points out that, while a participatory approach is rarely part of phenomenological research, it is implied in phenomenology and it could be used to argue for greater user participation in environmental design. In other words, these two approaches even though using different methods (ethnography versus design workshops) do not contradict each other. Rather they could be used to complement each other in the service of environmental design research. This study builds on these arguments by utilizing participatory design methods as part of the methodology to be employed. Triangulating a phenomenological approach and Space Syntax with research by (participatory) design can address the issues that traditional, more cognition oriented approaches to studying movement in architectural settings have been lacking.

Framework for Participatory Design

Researchers and practitioners from varied backgrounds practice PD in different fields: architectural design and urban planning, geography, and system development. Despite the wide use of the term itself, there seems to be no clear consensus in the literature on what PD is. Some call it an attitude (about a force for change in the creation and management of environments for people), a tradition (Robertson and Simonsen 2012), a movement (Sanoff, 1990 and 2007), a research methodology (Spinuzzi, 2005) or a social, ethical, and political practice (Horelli, 2002). Chisholm points out that PD "*is a typical 'mess' of late modern times that seems to involve a set of interconnected problems that are difficult to conceptualize and analyze"* (1998; after Horelli, 2002, p. 608). However, within its "messiness"

is the fact that PD cuts across disciplines and cultures and has strengths that can be of use to this study (Sanoff, 2005).

Roots. Participatory design, although relatively young, is fully established as approach. An extensive historical overview of the history of the PD field is beyond the scope of this dissertation and has been provided in detail elsewhere (see, for example, Kensing and Greenbaum, 2012; Sanoff, 2006). It needs to be mentioned, however, that, although most PD approaches have their roots back in the late 60s and 70s, they have emerged in different locations and from different disciplines. In particular, a focus on participation in design and development of computer systems materialized in Scandinavia[11] in which workers' unions along with system developers pushed towards the workers having more power in the process of introducing new technology into their workplace (Winograd, 1996). PD in system and workplace design came to the US later (Greenbaum, 1993). However, it did not reach the same degree as in Europe. On the other hand, participatory urban planning has somewhat simultaneous roots both in northern Europe with collective cohousing building projects that took place in Denmark, Sweden, and Finland (Horelli, 2002) and with the participation in community decision-making with community design centers appearing both in the US and the UK (Sanoff, 2006). Moreover, children's community participation in the global south has gained the attention of western-based institutions and researchers (Hart, 1992).

Working definition. Sanoff in his editorial to a special issue of Design Studies on PD argues that "[B]ecause PD practitioners are so diverse in their perspectives, backgrounds, and areas of concern, there can be no single definition of PD" (2007, p. 213).

[11] It is particularly noteworthy that participatory design as a field of technological design had its origins in Norway under the direction of professor Kristen Nygaard, who enlisted the Norwegian Iron and Metal workers union in participating in the design of technologies for their factories. Prof. Nygaard was the first professor of Informatics at the University of Oslo, the recipient of numerous awards. In fact, building 1 in this study is named after him. For more on professor Kristen Nygaard's work see his memorial web page http://heim.ifi.uio.no/gisle/in_memoriam_kristen/index.html .

Other PD practitioners seem to agree (Robertson and Simonsen, 2012). Despite this interdisciplinary 'mess', in order to bridge the gap between different fields of participatory design application, I propose a working definition of PD culled from the literatures and compromising elements from the different disciplines that employ PD approach:

– PD is a form of design that prioritizes both individual and group involvement of those affected by the design (users, citizens, or just simply people; Bratteteig et al., 1997);

– those affected by the design act as active stakeholders in the design process and not as mere consultants (Arnstein, 1969; Greenbaum, 1993);

– PD aims at democratization (in planning, product and architectural design, system development, policy making) and empowerment (Greenbaum, 1993; Hart, 1992; Telier et al., 2012).

Nested multiplicity. Situating PD within theoretical framework(s)

Multiplicity of partial perspectives in the design process. One of the central concepts for PD is 'situatedness'. Donna Haraway introduced it in her classic essay 'Situated knowledges: The science question in feminism and the privilege of partial perspective' (1988) in which she argues that there is no one objective knowledge about the 'real' world. Production of knowledge aiming to be an objective 'god trick of seeing everything' from everywhere ends up being from 'nowhere'. Such an 'unlocatable' knowledge claim is also 'irresponsible' or unable to be called into account (ibid., p. 587).

The alternative Haraway calls for is multiplicity of partial, embodied knowledges situated 'somewhere' (p. 584). Lucy Suchman, (2002) building on Haraway's arguments draws a parallel between knowledge production and design of technology. She argues that no universal formulas can describe nor answer the complex environmental realities and that

instead – design just like knowledge is always "from somewhere", situated or located within a particular context.

> This means identifying our participation in the various mediations that define the production and use of new technologies, and taking some responsibility for them. It requires analyzing the processes by which boundaries within and between technology production and use are constructed and maintained, and understanding our contributions to their reproduction or transformation. And it means mapping not only our local networks, but locating those as well within more extended networks, including an increasingly globalized division of labor (p. 94).

In other words, Suchman argues for the multiplicity of partial perspectives in the design process which will allow identifying responsibility for both the process and the outcomes. PD, although democratic and aiming at consensus building, allowing for a multiplicity of perspectives inherently brings out conflict (Bødker et al., 1993).

The centrality of 'situatedness' also lies at the heart of environmental psychology which places research in the context of the environments.

Multiplicity of theoretical perspectives on PD. Interestingly, on an epistemological level, there is also a multiplicity of approaches and voices on the theoretical underpinnings of PD. Speaking, in her case about planning, Horelli argues that PD *'[...] represents a multiparadigmatic and fragmented' phenomena'* (Horelli, 2002, p. 612). Design approaches have incorporated a number of theoretical underpinnings including the feminist critique (Suchman, 2002; Jansson, 2007), the Marxist perspective (Ehn, 1989; Greenbaum, 2008), a transactional approach (Horelli, 2002), the language – game philosophy of Ludwig Wittgenstein (Ehn, 1993; 2008) and activity theory (Bødker, 1991) to name just a few. Perhaps the most common theoretical and practice oriented reference framework here is Participatory Action Research (see, for example Hart, 1992); which, itself, usually builds on a number of theoretical, philosophical, and political approaches (see for example: Fine et al.,

2004; Stokols, 2006). To present this full spectrum of the theoretical influences in detail is beyond the scope of this chapter. In choosing my theoretical lens, I follow David Harvey's argument that, in the postmodern multiplicity of perspectives, the one theoretical framework that can underlie our actions is pragmatism:

> [I]f, as the postmodernists insist, we cannot aspire to any unified representation of the world, or picture it as a totality full of connections and differentiations rather than as perpetually shifting fragments, then how can we possibly aspire to act coherently with respect to the world? The simple postmodernist answer is that [...] we should not even try to engage in some global project. Pragmatism (of the Dewey sort) then becomes the only possible philosophy of action (Harvey, 1995, p. 52).

Pragmatism as a theoretical framework for PD

Harvey refers to, what he calls, a 'Dewey sort of pragmatism'. A closer investigation of Dewey's work sheds some light on what Harvey might have in mind. First of all, Dewey (like James) sees an **experience** as a totality of thinking, feeling, and doing and recognizes experience as an inseparable whole. This pragmatic understanding of experience is parallel to the concept of experience discussed in Chapter 3:

> It is not possible to divide in a vital experience the practical, emotional, and intellectual from one another and to set the properties of one over against the characteristics of the others. The emotional phase binds parts together into a single whole; " intellectual " simply names the fact that the experience has meaning; " practical " indicates that the organism is interacting with events and objects which surround it. (Dewey, 1934/1980, p. 55 after Telier et al., 2011, p. 10).

Secondly, it is the **interactions with situations** (both internal and external) that create experiences (see more in Greenbaum, 2008). In other words, experience and, consecutively, learning does not develop through passive observation but through the active experience of doing. This 'learning by doing' is an important concept for PD theorists and practitioners that build on pragmatism. Telier et al. (2011), for example, draw a strong parallel between Deweyan 'learning by doing' and 'design by doing' in PD.

Perhaps Dewey's most relevant work in the context of PD is his 'Art and experience' (1934/1980), in which Dewey focuses on what **aesthetic experience** is. He does not confine it only to art. Instead, he understands aesthetic experience as a form fulfilling a creative everyday experience with the environment (McCarthy and Wright, 2004). Interestingly, as McCarthy and Wright point out in their book on " Technology as Experience ", the focus here is not on the qualities of the object of experience but rather on the experience itself (see ibid., p. 18). In other words, an object or an environmental quality might have the ability (or rather affordance in Gibson's terms) to be experienced as fulfilling, but, if it will, depends on the person who experiences it (again, very much like an affordance). This places experience within a situated context. Telier and the coauthors argue, after Dewey, that "*every human is potentially able to acquire aesthetic judgmental skills and to participate in creative practices*" (2011, p. 10).

Furthermore, they argue, using Dewey, that creating, which in the context of PD would directly refer to design activities performed by participants, is very much like inquiry:

> According to Dewey, all creative activities show a pattern of controlled inquiry: framing situations, searching, experimenting, and experiencing, where both the development of hypothesis and the judgment of experienced aesthetic qualities are important aspects within this process. The main difference between doing scientific research and making art is that the former aims at the production of theories whereas the latter concerns inquiries into materials used in the production (Telier et al., 2011, p. 10)

We can understand Participatory Design within Dewey's framework of learning aesthetic experiences in the act of doing or designing. Telier and coauthors argue further that the designs that are created in PD can be understood as materials for the development of aesthetic experiences for which they are being designed. In other words, these designs support, or as I would argue in Gibson's terms – afford, aesthetic experiences (see Telier et al., p. 28).

Participatory Design as a research methodology

Despite the multiplicity of theoretical and practical takes on PD, there seems to be an agreement that PD is a methodology for/of design in which users get involved in the design process as active stakeholders. But can one make a claim that PD is a research methodology? Hart argues that participatory design that truly involves users in the process "*requires analysis and reflection – what is commonly called 'research'* " (1992, p. 15). Spinuzzi makes a similar claim that "*participatory design is research"* (2005, p. 163). Furthermore, the consensus among PD researchers seems to be that PD bridges the gap between research and design (Simonsen and Robertson, 2012). There is, however, no consistent conceptualization of what PD is as a research methodology. This should perhaps not come as a surprise given the multiple theoretical groundings PD builds on.

Spinuzzi (2005) presents the most developed argument for PD as research methodology by applying a constructivist paradigm and arguing that, through engagement in the design process with others (co-design) and the material designs themselves, users' so called tacit knowledge gets revealed. The concept of tacit knowledge introduced by Polanyi (1962) and taken up in computer system design by Greenbaum and Kyng in 'Design at Work' (1991) refers to knowledge and skills that are not explicit or easily verbalized. Thus, in order to more clearly get at unspoken knowledge and skill, it is important to have participants actively engaged in the situations they encounter at work. Spinuzzi further argues using Ehn (1989) that participatory design supports the revealing of this tacit knowledge in 'knowing by doing' that happens in the process of co-creation with other participants. And as the tacit knowledge surfaces and becomes more explicit (either through verbal co-construction or non-verbal means 'doing'), participants are more able to critically reflecting on it.

Given these arguments, I wanted to find out if PD could offer more insights into tacit knowledge of mobility experiences than the other two methodological approaches

used in this study (Space Syntax methodology and ethnographic methodology). Thus, this methodological approach can be used to bring a more action-based perspective on affordances for mobility experiences and one which allows participants to interact with each other, not just with the researcher or designer.

Secondly, building on Dewey's understanding of aesthetic experience, I have employed a Participatory Design methodology to actively engage the participants in the study in identifying the fulfilling or satisfying experiences of mobility and the physical qualities that afford them. As pointed out in Chapter 5, the ethnographic part of my study has been more successful in getting the walk-through participants to verbalize more of the negative experiences of mobility than the positive experiences and the accompanying affordances.

Validity of PD research. Participatory Design is not a positivistic research methodology. But in arguing for it as research, it is also crucial to address the issue of validity. I here employ an understanding of PD as research aiming at capturing multiple, situated knowledges of various participants about their experiences of mobility with particular emphasis on those mobility experiences that are fulfilling and satisfying to individuals and as groups. Given this conceptualization of PD as research, how does one ensure confidence in findings?

In this context, a very useful argument on validity comes from Winkel's (1993) discussion on validity in relation to environmental design evaluations. Environmental design evaluations include pre-design evaluations (usually of existing settings) to identify possible changes that need to be made and post occupancy evaluations (POEs). I find this approach relevant to the research methodology of participatory design. In fact, the PD method that I employ in this study does have elements of pre-design evaluation in that the participants are involved in discussing interior designs for the not-then completed fourth building of this

study. What is more, Winkel points out that environmental design evaluations are inherently political change-oriented processes and, in that sense, no different from PD.

Winkel argues that:

> In pre-design research, validity essentially involves an indication of the *fidelity* with which the evaluation team has been able to identify the entire range of problem sets that are relevant to each group of participants [...]. (ibid., p. 93).

I argue that similarly in PD, validity means that those involved in the PD process accurately identify the array of issues that need to be addressed in the design process. Is there a way to measure this sort of validity? Winkel argues that, in environmental design evaluations, '*no single validity assessment is either desirable or possible*' arguing instead that:

> [T]here are multiple beliefs regarding what is desirable in an setting [...] and these translate into multiple experiences and actions, [...] There are multiple (but not infinite) validities which are constantly being negotiated (ibid., p. 94).

In my opinion, this position on validity can be directly applied to PD research that has a multiplicity of perspectives of various actors affected by the design at its core. According to Winkel, confidence in findings in change-oriented research such as pre-design evaluation (and PD, as I would add) can be assured by aiming at representativeness of the participants sampled that take part in the research and emphasizing the role of the socio-spatial context of their experience of settings. In this study, I do both.

Methods

Participants and location of the workshop. All participants of the ethnographic study that preceded the participatory design workshop were re-invited to take part in the workshop (either personally or via email). In total, nine persons expressed interest in taking part in the workshop, five persons from building 1 and four from building 2 (one of the users

from building #2 was also an occasional user for building #3). The participants were divided into two groups depending on their primary building.

Other people present at the workshop included two technical and facilitation assistants (who helped with arranging the room, preparing the screens) and two persons responsible for setting up the specific technology used in the workshop.

The workshop took place in a studio room in building 2 and lasted from 9 am till 4pm (including a lunch break). The two groups were sitting each at a large table.

The Future Workshop method. Extensive reviews of methods across the different fields that employ PD research and design methodology show that Participatory Design methods are often very similar, if not the same, regardless of the discipline (see, for example, Brandt et al., 2012; Bødker et. al, 2004; Horelli, 2002; Sanoff, 1990 and 2000). A detailed description of various workshop methods is beyond the scope of this chapter and I will only focus on the Future Workshop method that I have chosen for this study. It was chosen because if offers a phased approach which builds on data gathered using ethnographic analysis. It does this by allowing participants to interact with each other in discussion and a design exercise thus giving voice to social relationships and agency. Additionally, this type of workshop takes into account verbal and design activities that give shape to current and future planning situations.

The Future Workshop method has been used in urban planning, architectural design, and technology design (Horelli, 2002; Bødker et al., 1993, 2004: Kensing and Madsen, 1991). The Future Workshop method was described by Jungk & Müllert in 1987 (and further developed by Bødker et al., 2004; Jansson, 2007 and others). It usually consists of four phases: I) Critique, II) Fantasy, III) Planning and IV) Testing. The phases of Future Workshop correspond in some ways with a research informed design cycle as presented by Zeisel (2005, p. 51). The critique phase is parallel to post occupancy evaluation (as a first step

for architectural programming) in which the current environment is critically assessed in terms of what is and what is not working for its users. Visioning is in some ways similar to programming the environment or thinking through the activities and functions (programs) that are to take place in a future building. The planning phase corresponds to the design phase. And, finally, evaluation of the design is what, in the Future Workshop method, is called testing. However, the crucial difference between these two ways of doing design is the direct participation of users in the design process and their interaction with each other. Furthermore, in PD, the researcher's role is to fade to that of a facilitator. This is not always the case in research informed design.

This project's workshop was conducted following the Future Workshop format. A detailed description of each phase and the instructions given to the participants is provided in the subsequent sections followed by the findings of each phase.

Introduction to the workshop. The first phase of the workshop began with the participants giving short introductions to themselves. As the facilitator, I then presented the goals of the workshop which were to **develop ideas and a design proposal that would accommodate users' movement and experiences "on the move" in the new building**. When the workshop took place, the new building was being constructed on the site close to the other three study sites. The workshop participants actually had a chance to visit the construction site and the inside of what was becoming the new building during the workshop to get a sense of what exactly was already in place and to situate their design suggestions.

At the beginning of the workshop, the department chair made a verbal contract with the participants that their ideas would be taken into account in the further design and facility management processes. In particular, he emphasized that the ideas would not only be implemented in the virtual representation of the building (called World Beside which I

describe later on in this chapter) but also would serve as inspiration for designing the content of the information screens that would be selected in various places throughout the new building as well as serve as inspirations for creating a hospitality/reception program.

I also made transparent to the participants that the workshop was part of my research project and I was hoping we could collectively address my research question, namely how do environmental qualities (architecture, artifacts etc.) influence our experiences of movement in architectural settings. It is important to note that, while Future Workshops, like other participatory tools, generally do not have a set agenda other than that dictated by the participants, this Workshop was part of my thesis project and the details of my research agenda needed to be made clear.

Participants were presented with the plan for the entire day which began at 9 am and lasted until 4pm. There were also some snacks, coffee, and lunch that I provided to the participants. The whole workshop was recorded (each group was both videotaped and audio recorded).

Phase 1. Critique phase or what do we know already about movement in your workspaces. After introductions, following the standard Future Workshop model, we proceeded with the so-called the Critique phase. The aim of this phase is usually to reflect critically on the existing situations. Identifying possible reasons for dissatisfaction with the current setting prepares participants for developing ideas for alternative designs later (Sanoff, 2006). The critique phase can also be conducted in a form of series of walk-throughs (Sanoff, 2000; Horelli, 2000). However, since the walk-throughs were already completed, the workshop format was used to supplement them.

In the case of this study, the preliminary findings of the ethnographic study that involved a series of walk-through interviews were presented to the workshop participants. I presented selected quotes and pictures taken by the participants during the walk-through

interviews. After this short presentation, the participants were encouraged to work in groups and brainstorm about **what they think and feel and do when walking though their current workspaces** as well as:

> What particular qualities of the physical environment relate to these experiences of movement?
>
> What are the problems with how the space is arranged in terms of users' movement?
>
> What are the good things about the design of the current buildings in terms of users' movement?

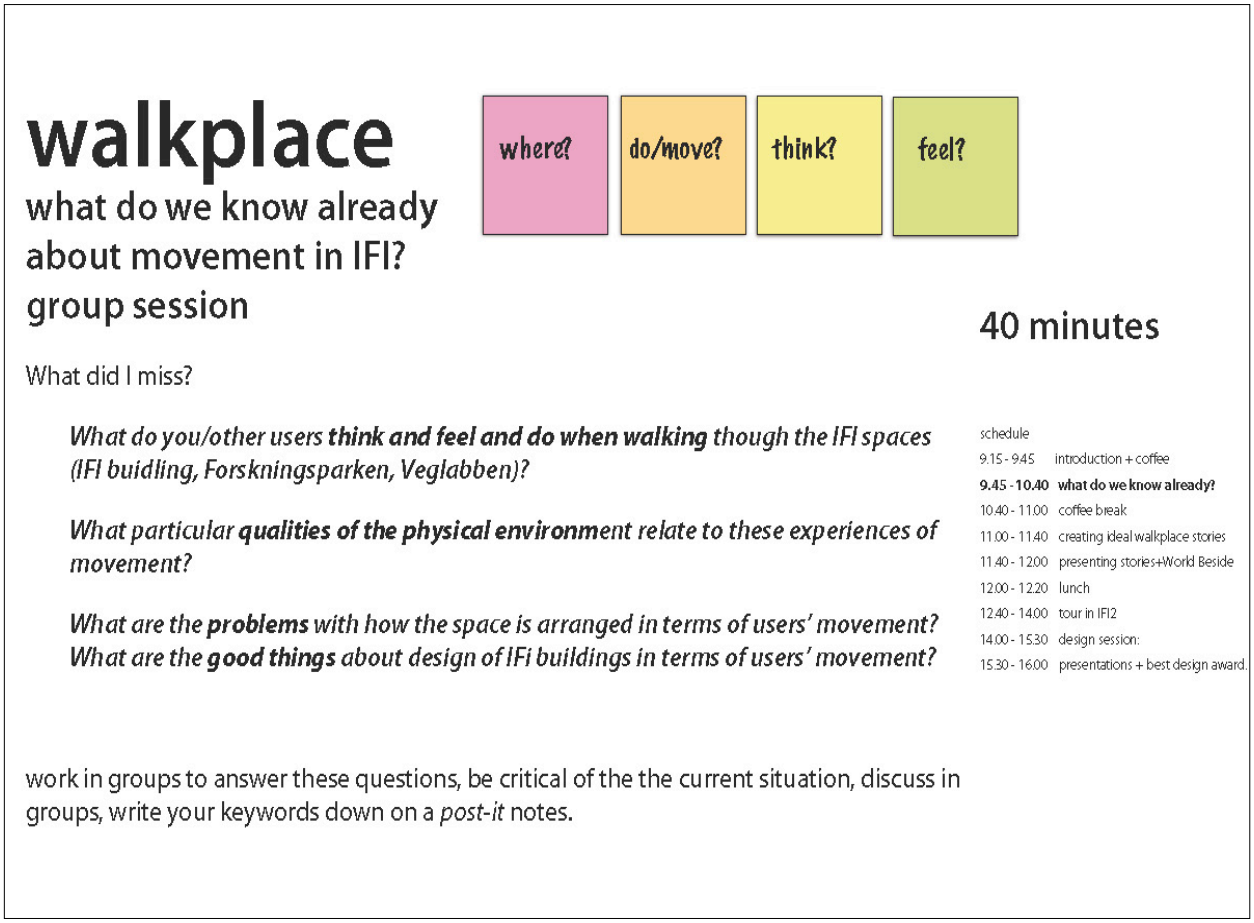


Figure 62. Instructions presented on the screen to the workshop participants for critique phase.

The participants were asked to work in groups to discuss these questions and to write down relevant keywords on post-it notes. The experience of jointly discussing and

writing and/or drawing notes helps break down barriers within a group by breaking down the traditional way that university meetings are held. To probe for experience components as well as affordances that might induce them, the post-it notes where color coded for 'do?', 'think?' 'feel?' and 'where?' categories. After approximately 40 minutes, the groups presented their ideas to everyone in the room (discussed on p. 132) and then took a coffee break.

Phase II: The Fantasy phase or creating the ideal mobility experiences.

The next phase of the Future Workshop is called the Fantasy phase. In involves 'envisioning', a technique that is commonly used in participatory planning (Horelli, 2002), community development (Sanoff, 2006) and the participatory design of technology (Spinuzzi, 2005). The aim of this phase is to develop visions for a future (for the particular issue/setting), ideal solutions, and develop them without yet taking any restrictions into account.

In this phase of the workshop, participants were asked to develop 'ideal' visions of their mobility experiences in a new setting. The participants were encouraged to think of the possibilities in terms of what experiences of navigation and movement uses it would allow for rather than in terms of specific design solutions. Additionally, the participants were asked to imagine, discuss, and work out a story about their journey into/through an ideal workplace.

The main question for them to address was what they would want to do, feel, think, see/smell, hear, (experience in general) from the moment they approach the building. Just as in the previous phase, the participants were asked to represent their ideas on post it notes color-coded for the different experience types (cognitive, emotional, and behavioral) as well as the environmental qualities affordances that would accompany these experiences (see Figure 63. for exact wording of the instructions for this phase).

After nearly an hour of group work, the participants presented their ideas to everyone gathered in the room. Their ideas will be described later in this chapter.

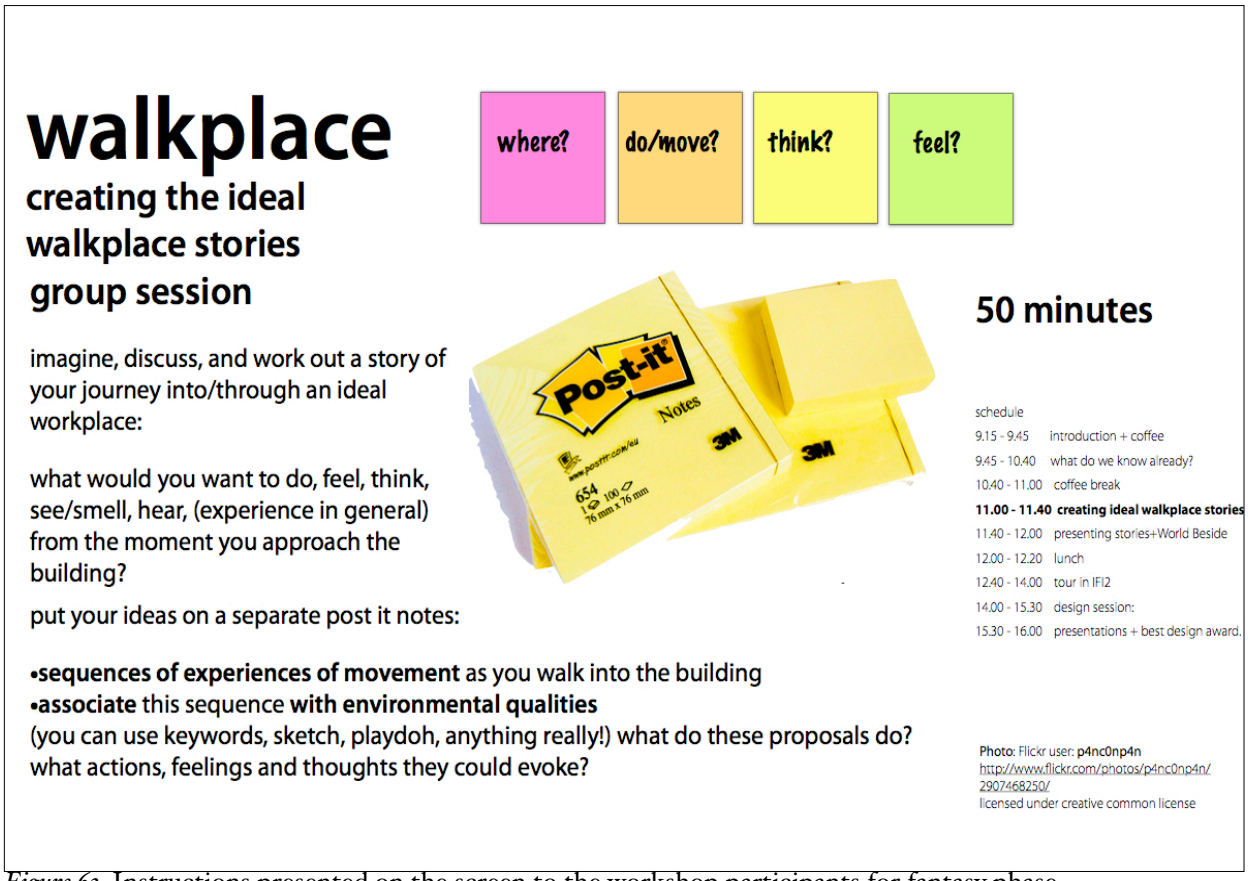


Figure 63. Instructions presented on the screen to the workshop participants for fantasy phase.

Phase III: The Planning phase or creating the ideal mobility affordance. In the next phase, called Planning, the participants were encouraged to use their ideal visions to develop more realistic and concrete solutions for the future setting.

In our workshop, this session started by introducing the potential restrictions, namely by giving the participants more detail about what already is and is not designed about the future building to set a stage for their design work. This was done by one of the members of the planning committee who was also an employee in the department. After

a short 'theoretical' presentation, the participants were taken on a tour of the construction site where we learned and experienced not only what the limitations of possible designs were but also what it was like to be in the building. As we returned to the studio where the workshop was taking place, the building design was further presented in various formats; the groups got large printouts of the layout of the new building and had an architectural model at their disposal.

Finally, an interactive 3d model of the building called 'World Beside' was presented by its developers. The 'World Beside' was an interactive model of the new building developed in a public-private partnership between the university and an external company. It was initially developed for educational projects with high school students to learn about the department and the field of informatics. For the purpose of this workshop, each participant had the 'World Beside' installed on his or her laptop. The model allowed the participants to enter it with avatars and move around it at the same time as other users. The two groups had two separate versions of the 'World Beside' so that they would only enter their model and not have access to the other groups' models.

Participants were asked to transform the ideas they generated in the previous, fantasy phase into actual design suggestions that would accommodate their movement and experiences "on the move" in the new building, bearing in mind the possibilities and limitations that were presented earlier that day.

The 'World Beside' was redesigned for the purpose of this workshop so that the participants were able to add and change its physical qualities. The easiest way to add to the model was to upload a picture to represent their ideas. It was possible for the participants to take a picture of anything they had drawn or created in any way or add any photograph they found on the Internet. In addition to World Beside, the participants were presented with a variety of techniques for shaping the environment and artifacts with a number of possible media for enabling the process: drawing tools, paper and cardboard, glue, cutting

tools for mockups, Lego blocks and Playdoh as well as an actual architectural model of the new building. These different physical materials, in addition to the 3d model are considered important in helping participants do and act and thus go beyond simply talking about problems and possibilities.

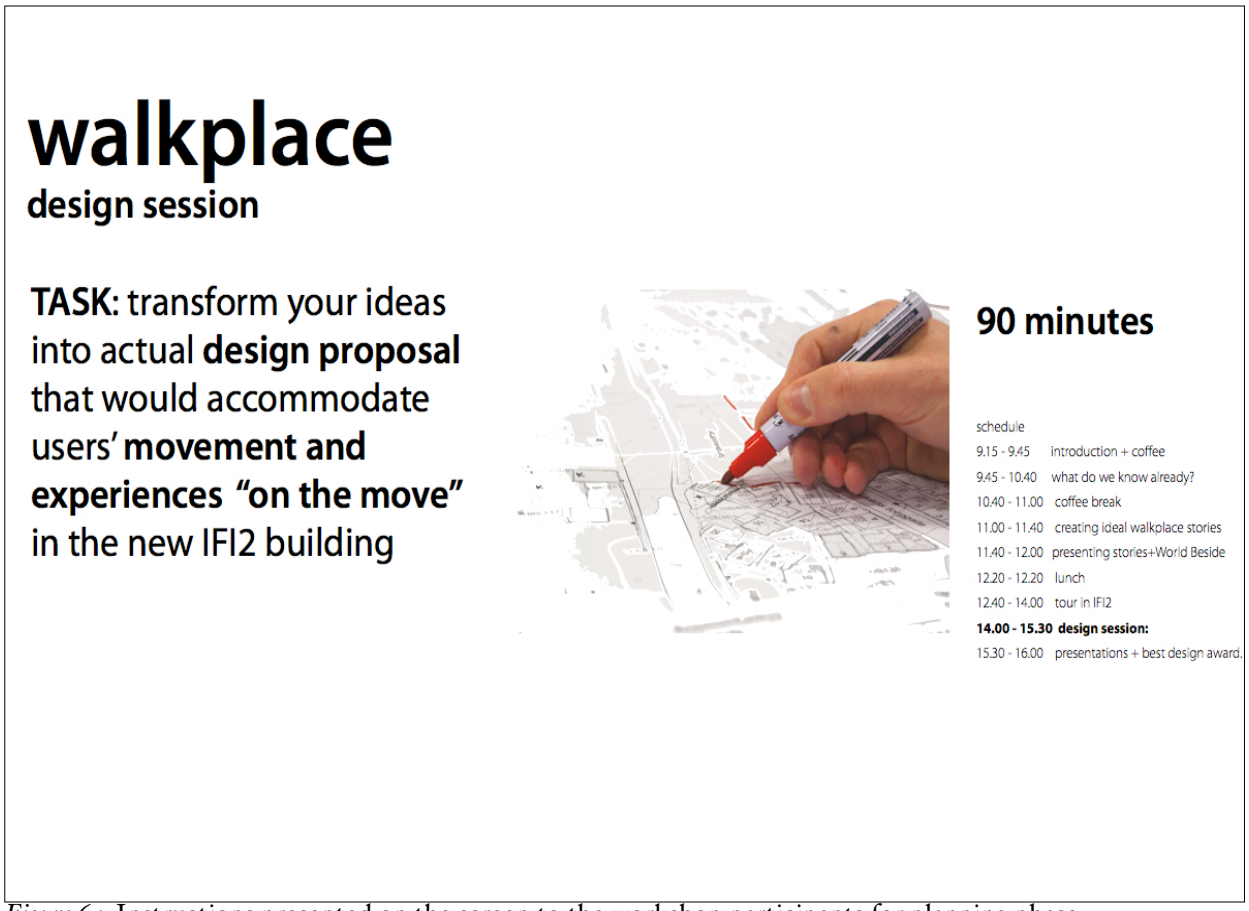


Figure 64. Instructions presented on the screen to the workshop participants for planning phase.

After an hour and a half, the participants were asked to present their design suggestions and the presentations were video recorded. All the suggestions were listed on a board and the participants voted their favorite design suggestions at the end of the workshop. A symbolic design prize (sweets) was divided between both of the groups.

Phase IV: The Testing phase – choosing the design solutions that address users' needs. Lastly, each group presented their designs in the form of a virtual walk-through, walking through their version of the new building with design solutions in place. The presentation was structured around the design solutions in which each group would describe the proposed designs in terms of their mobility experiences. All the design suggestions were listed on two boards (one for each team) and the participants discussed and voted for their favorite design suggestions at the end of the workshop. A symbolic design prize (sweets) was divided between both of the groups.

Analysis

The data obtained included verbal accounts delivered by the participants and both physical and digital artifacts. Even though each phase had different aims, they all looked at needs and expectations in terms of their movement experiences and the physical environment that influences them either in the old building, an ideal workplace, or in the new building.

The data, just like the ethnographic data, were transcribed both in Visual Understanding Environment and Atlas.TI [12]. Both the text and images of the post-it notes and design solutions were coded and analyzed in terms of the possible affordances for the experience of movement for which they were designed. In the coding process, I used both the categories developed in the ethnographic study of this research project and bottom up codes that emerged from the data.

[12] See pp. 64 and p. 65 for more details on these pieces of software.

Findings: affordances for mobility revisited

Throughout the initial analysis, the data were also divided into three groups according to the workshop phases as they each had different objectives though all were focused on affordances for mobility experiences. Some of the findings from the workshop data supported the affordances identified earlier (both in this and other studies). Others – have provided new insights into what environmental feature might influence mobility experiences. The findings are presented in a similar manner as in chapter 5 with affordances listed and accompanied by participants' quotes. Additionally, the data from the planning phase are supplemented with exemplary images of the design suggestions proposed by the workshop participants.

I) Critique phase. The first phase of the workshop was a critical reflection on mobility experiences in the actual, existing buildings and, in that sense, the object of this research phase was the same as that of the ethnographic study. These data confirmed the findings of the previous, ethnographic part of this study. The participants in particular emphasized the importance of effectiveness in their goal-oriented mobility. Just as in the walk-through interviews, the participants in this phase of the workshop emphasized the role of cognition (or, more specifically, being able to understand the environment) and the confusing environmental qualities that seemed to contribute significantly to the negative experiences of mobility. The following affordances (identified previously in the ethnographic study) were supported by the data from the Critique phase of the Future Workshop:

A15 (part 1). Openness affords invitation, positive emotions, use and at-homeness.

> "It is kind of an open area, it is kind of nice place, there is light there." (009)

A15 (part 2). Narrow, enclosed and embedded spaces are not inviting and afford less use and less acquaintance with space

> "[I]t also a bottle neck, you don't know where to go and all the places... and also when you go in you don't know where to go because all the places that you could go to are suddenly very small, you have a very broad door and then." (08)

A16. In general, places where people gather invite and attract other people. People attract people.

> "[C]afeteria [has] a good location, it is in the center of the building, it is convenient, it is a nice meeting place, it is a social place, where you can bump into colleagues." (80)

A14. Light is experienced as an invitation and is, in general, aesthetically pleasing. Dark spaces afford the feelings of being uninvited or a sense of not being supposed to go somewhere.

> "We buy lunch together and we go to the south end because that is a place where there is the most sun." (049)

A21. A closed door is uninviting, affords a barrier to walking as well as experiences of discomfort and inconvenience. To a large extent, it is the user's body that determines the degree of experienced barrier.

> "[T]he door in the area [...] is a daily hindrance , is a daily uphill experience, you never know which way it opens, I never know if I have to use my key card or not, it might be some time limit, that I need to use my card after, but I

> don't know this time. Sometimes I carry things when I go there and I don't ... it feel very clumsy." (015)

A7. The complexity of the layout along with its large size, the building affords less understanding (cognition) of the socio/environmental context and thus less engagement.

and

A15. Narrow, enclosed, and embedded spaces are not inviting and afford less use and less acquaintance with space (cognition).

An account delivered by participants from one group made me reword affordance **A20** (Back ways and emergency exits afford engagement and excitement). They emphasized that it was not only the back ways and emergency exits that can afford this engagement and excitement. In fact, it is the general 'mystery' of any hidden parts of the building.

> [I]t is fairly a big place and has many hidden place[s] which is often a good and a bad thing; it is difficult to find things because they are a bit hidden but also you might get surprised because there are actually showers in [this building] and you become happy when you discover this fact (065).

Thus the new wording of the affordance:

A20. The hidden or less accessible areas of a building can afford engagement and excitement, where 'hidden' and 'less accessible' are understood in terms of Space Syntax as being less integrated.

II) Fantasy phase. In this phase, the participants were encouraged to focus on ideal experiences and affordances for mobility. And mostly positive experiences were mentioned which was to be expected given the goals for this phase. Interestingly, almost all categories identified in the ethnographic part of this study were either directly mentioned or implied by the participants. The emphasis was different though: comfort and

convenience, agency or cognition (as in being able to understand the environment) were only implied as obvious components of the overall mobility experience in an ideal scenario. In other words, they were mentioned or implied but the participants did not focus on them in their descriptions of ideal mobility experiences.

On the other hand, the two most important experiences that emerged from this session were the 'sense of being at home' and the 'sense of being invited or welcomed' – categories that were recognized in the ethnographic study but, in particular, the category 'sense of being invited or welcomed', have not led to identifying many affordances. Sometimes these two categories were inseparable:

> "I would like to feel welcomed, perhaps some colleagues to greet, some congregated area or something at the entrance, not a place where you hurry through but somewhere where you actually meet someone just for greeting them and now where I have my office where I have to pass through an area with people that I don't know and when they don't greet and when I don't greet them on regular basis I don't like that." (127)

Furthermore, engagement both with the physical and social environment proved to be an important category for ideal mobility experiences.

> "I would [like to] have a real person because it is a small building it would be the same person and they know the building, they know me they have some sort of responsibility, they say 'hello' when I enter and they know things." (121)
>
> "I would like to be nice corridors, perhaps with some[thing] inspiring." (127)

Additionally a new category of experience that I call '**place identity'** emerged. I understand it as building on Edward Relph's "Place and placelessness" (1976) as *genius loci*, that is as a characteristic of the place (and, in this sense, different from Proshansky's understanding (1985) of place identity as characteristic of a person). In other words, people experience a place as having some sort of identity, an identity that may be part of the social fabric or social aspects of place/people interaction. This experience is associated with a

sense of belonging and conveys a sense of pride (of belonging to the place of a particular identity). It is best portrayed by this quote:

> "[T]he entrance area should make proud of where you are working and it should remind you of the history of the institution and the values for the institution." (111)

In fact, this experience category corresponds somewhat with Seamon's category of distinctiveness (see Chapter 5). Seamon understands 'distinctiveness' of place as a sense of identity that makes it distinct from the larger environmental context. In the findings of the ethnographic study, this distinctiveness was a part of the broad category of making sense of the environment in which features of the environment allowed for understanding a specific part of an environment as one entity. However, as in PD, the experience of the identity of a place was often mentioned by the people who took part in the participatory design workshop, I categorize it as a distinct experience different from Seamon's category of distinctiveness. It is important to underscore that this category goes beyond Seamon's distinctiveness – not only was the place wished for (by the PD participants) to be experienced as a distinct separate entity but it was also strongly associated with positive emotions and sense of pride. In this sense, this experience is strongly associated (and was co-present with) sense of belonging and feeling at home as well as the sense of being invited:

> "{I]t is an inviting building to visit and we feel good and welcomed and proud of, it is a nice building it is a good place to be." (136)

This phase was focused on ideal mobility experiences and the participants were not encouraged to give concrete physical examples that could be translated into affordances. Additionally, a few general affordances were mentioned that had not been pointed to in the ethnographic study:

A24. The size of the building is associated with the sense of effectiveness and convenience.

> "I approach the building I want to have a short distance to my office. I mean for just this ideal trip to my office I don't need all these other things so for that reason I would want a small building." (122)

A25. The entrance area not only affords a user to expect the possibility of understanding the environment and its rules (A3) but also to get a sense of being invited and to convey the place identity.

> "[I]t should be easy access and it is an inviting building to visit and we feel good and welcomed and proud of, it is a nice building it is a good place to be." (136)

A26. A structure with gradual embeddedness of spaces (or step depth in Space Syntax terminology) supports sense making and understanding of the setting.

> "I would like some kind of funneling into my office some kind of ... you get into a smaller... like when you drive on a road somewhere, first the big road than the smaller road, and then perhaps a very small road kind of logical localizing. like, gradual being more and more local close to my office." (127)

III) Planning phase and IV) Testing phase. In this third phase of the Future Workshop, the participants were encouraged to develop actual design proposals that would fit with their mobility experiences as identified in the previous phase and they would also evaluate them. The emphasis was put on the physical solutions though the participants were encouraged to couple the physical designs with the mobility experiences they would afford.

Most common in both groups were designs that conveyed what I would call a meaningful, active, and playful engagement with the environment. Engagement as an experience category had been identified in the ethnographic part of this study. However,

the affordances associated with engagement were mostly environmental qualities that allowed for various forms of engagement with other users of the building (the social environment) and only one affordance (A22) that was associated with engaging in a positive way with the physical environment. In contrast, the PD method revealed a number of affordances that not only support mobility experiences of engagement with the physical and social environment but also ALL other categories of positive experiences.

The following affordances dealing with interactive technology grew out of this phase and, as will be discussed later, were important to the participants who are professionally involved with information technology.

A27a. Interactive technology can afford a meaningful engagement and support place identity and a sense of belonging.

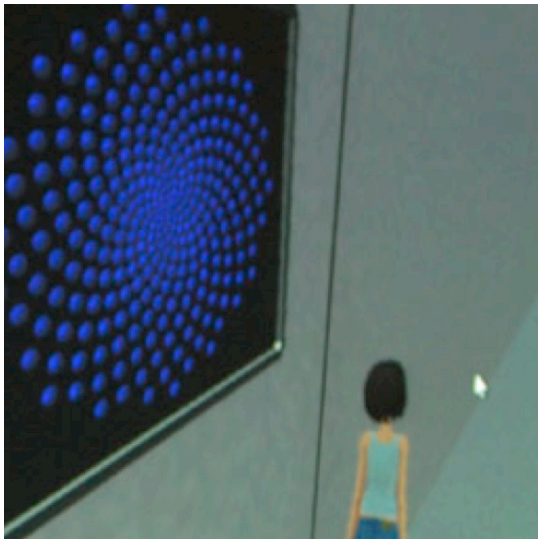


Figure 65. Interactive technology can afford a meaningful engagement. For these users it also supported place identity and a sense of belonging.

"[W]e would like some interactive mathematical art, because there is so much we could show off that could color our daily experiences in a good way. [...] We have this on big screens and we could really yeah, have something inspiring and beautiful to look at which could serve the purpose of inspiring to work there or people that come and visit and it could add a 'wow factor'." (236)

A27b. Interactive technology can afford a meaningful engagement, convey a sense of being invited, and support understanding of the environment.

Figure 66. Interactive technology can afford a meaningful engagement, convey a sense of being invited, and support understanding of the environment.

"[W]hen you come down here you are welcomed by a robot.[...] you were to be idealistic it would know who you are, greet you , would know where you are going and help you and make your ordeal better if its realistic then it is probably navigation or some guidance." (240/43)

A27c. Interactive technology can support an aesthetic experience through meaningful, active engagements.

Using Dewey's understanding of aesthetic experience as a form of fulfilling, creative everyday experience with the environment, I argue that all of these meaningful engagements are a form of aesthetic experience. In particular, it is very evident that it is the active component, the interaction, or 'the doing' that brings about the aesthetic pleasure:

> "When I walk along the floor, a color follows me. It doesn't have to be navigation, it can just be playful, it can be just something when I step on it, it lights up and propagates. If I stand here and you stand 50 meters over there we might you know make them collide in the middle, ... or imagine when I come in the floor is white but then the more people come in the more intense colors it gets and then by the end of the day you get to see where do all these people walk. Another one could be that you add a pixel every day, and let things emerge to use the dynamic, socio-technological ... that is the idea. We also talked about having some triggers in the floor with small information sentences about some technology or something to get people curious about to find out more about different subjects." (256/47)

A27d. Interactive technology can support a sense of agency through meaningful, active engagements.

A unifying element of all the above-mentioned affordances is the fact that interactive technology can convey agency to the user on the move. Most of the designs suggested by the people taking part in the participatory design workshop revolved around interactive art in which users were not mere subjects to the technology but active agents. The fact that this type of technology can afford a sense of agency directly related to affordance A25 identified previously in the ethnographic study. A25 referred to frustration and lack of agency caused by being subjected to the technologies that controlled access. On the other hand, as the data from the participatory design workshop suggest, being active agents engaging with the technology in advance of its implementation can lead to a whole array of positive experiences. They key here seems to be in the difference between being a passive subject and an active agent having a sense of efficacy.

A28a. Signage can be used to support understanding of the environment.

Figure 67. Signage can be used to support understanding of the environment.

"The library has signs here, they should be clear and inviting." (253/46)

A28b. Signage can be used to afford 'place identity' and to support the sense of belonging.

Figure 68. A large sign on top of the building, (here not visible because of the perspective at which thescreenshot was taken) supported place identity and sense of belonging for the workshop participants, by marking their territory.

"There is a sign, it is really huge, it is flashy and it says the department of informatics, IFI, so when you drive along the road, no mistake, here is IFI. We should use that area, put a big sign out there, mark our territory." (232)

A28c. Signage can be used to afford a sense of being invited and sense of being at home.

Figure 69. Signage can be used to support a sense of being invited and sense of being at home.

"[W]e also have a sign here so you have it on all entrances we want a welcoming feeling." (272)

"[W]e are at the main entrance and the first thing we see is welcome sign to give you a cozy feel about the university." (159)

A29. Artifacts typically associated with the private space of the home afford the sense of at-homeness.

Figure 70. Artifacts typically associated with the private space of the home such as plants, coffee machine, pillows etc. can support the sense of at-homeness. Here flowers planted by the entrance to afford "coziness".

Participants have emphasized the need for achieving the sense of feeling at home. No major designs were created to directly support this experience. Instead participants chose small interventions to support it; among others, they suggested plants, a coffee machine (or more specifically a coffee smell that made them feel at home), small artifacts like pillows:

"[We] have come to and we have put up some flowers to make it cozy." (210)

In general, however, it was pointed out that it is the interaction with other people that supports the sense of at-homeness.

Additionally, elements of the natural environment (such as water, plants, and wildlife) were included in the suggested designs. Participants did not specify what experiences they would evoke but rather they were perceived as a prerequisite in an environment that would support mobility which confirmed A20 from the ethnographic part of this study:

> "[T]hink we will need a tree here and a birdsong [...] and the waterfall we need a bit of water on this side of the building too I believe." (200)
>
> "[W]e have also put some flowers on this side." (226)

Conclusions and discussion

One might argue that the findings, especially those that refer to the role of technology in mobility, are specific for this particular group of users whose work revolves around technology. This might be considered a limitation of this study. However, this study assumes a 'design from somewhere' perspective which acknowledges a particular contextualization and does not seek to find universal, general answers. Within this paradigm, universal findings are not what research and design strives for.

Furthermore, technology in its different formats is increasingly a part of both contemporary architectural design and facility management and I want to argue that, although the insights from this participatory design session should not be literally translated to designs for other buildings, they can, in fact, serve as inspiration. Since the focus of this dissertation is on affordances for mobility experiences, the wide and rich array of design inspirations arising from the workshop are included only as examples. Specifically, as the above-mentioned affordances illustrate, technology in its very diverse forms has proven to be an important medium supporting a whole array of experiences. However, it is not the actual design solutions that workshop participants came up with that should serve as an inspiration for other designs but rather the fact that technologies can be used to evoke multiple mobility experiences.

While some of the affordances that emerged from the PD workshop data were previously identified in the ethnographic study, many of the affordances that came forth were new. The weight assigned to different experience categories proved to also differ between these two methodological approaches. This particular workshop method was focused on the future and thus more on possibilities than on hindrances to mobility. The participants concentrated more on positive experiences 'on the move' than on, for example, barriers or frustrations afforded by the environment.

First of all, a new category of experience has emerged, namely ‘place identity', closely associated with sense of belonging. Both these categories just as all the other experiential categories identified in this study have a strong social component to them. Place identity and belonging is closely related to being a part of the group. Secondly, the importance of meaningful, active, playful engagement with the environment while on the move came to the forefront. Both of these categories of findings are consistent with the social interaction character of participant controlled dialogue and action. The fact that Participatory Design, in giving participants voice to express their ideas with each other and actions to make the ideas more concrete, fosters agency and often new outcomes among the participants.

Based on the theoretical grounding and the data analysis, I propose to combine the category of aesthetic experiences with engagement into one category embracing meaningful, aesthetic engagement with the socio-environmental context. Based on these findings, I propose an updated model of coupled affordances and mobility experiences (See Figure 71).

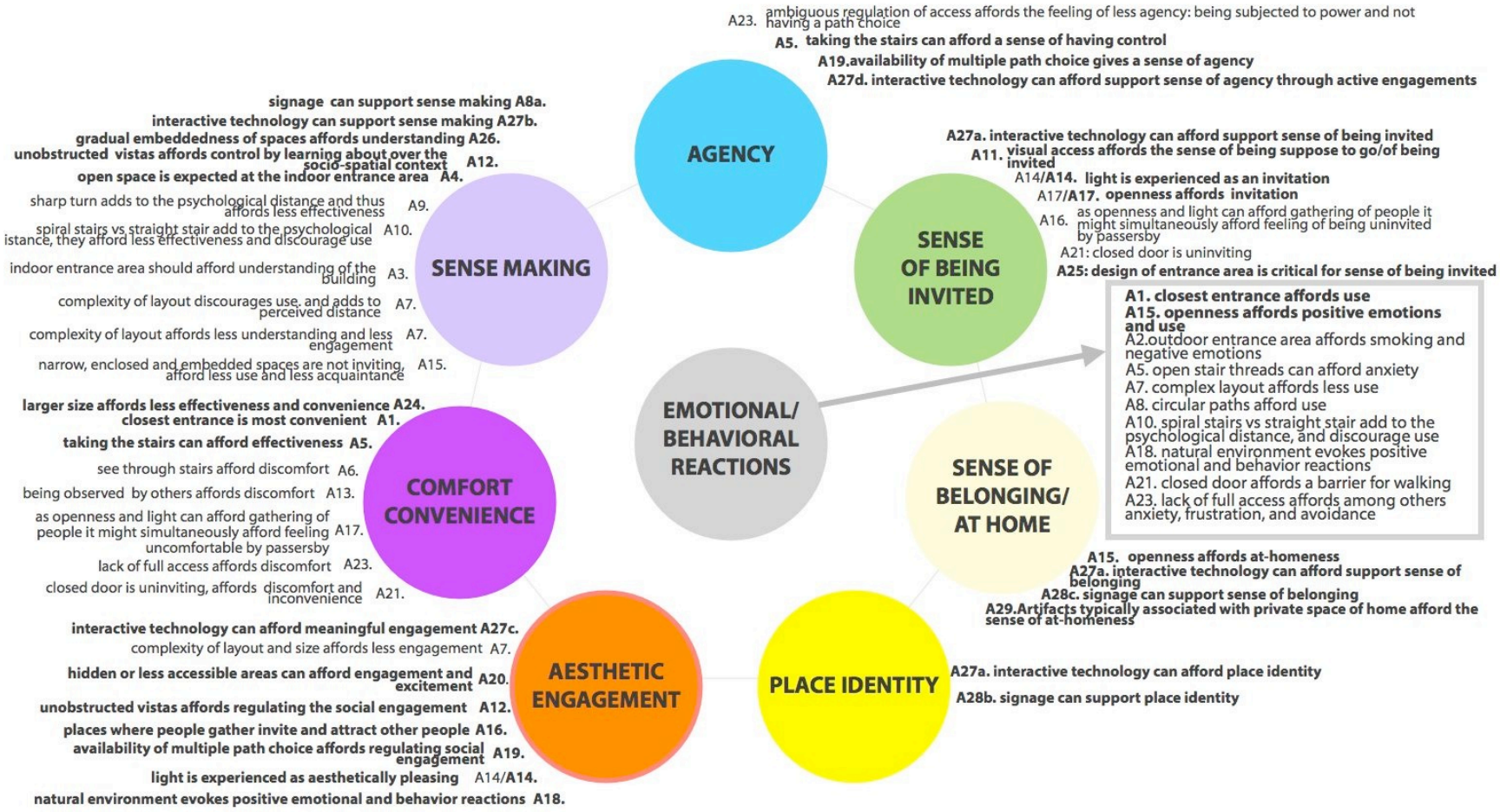


Figure 71. An updated model of identified categories of experiences coupled with affordances. Affordances listed in bold are associated with positive experiences and in regular font – with negative ones.

Chapter 7

Walkplace: design applications and theoretical and methodological contributions

Walkplace: design applications and theoretical and methodological contributions

Design applications: affording experiences on the move

The final stage of analysis has been inspired by the work of Christopher Alexander and his colleagues who created "A Pattern Language", previously mentioned in Chapter 4. The authors provide a set of guidelines for the design of towns and buildings, dividing their 'language' into 253 patterns and each is devoted to a case of varied scale: from independent regions (pattern #1), through identifiable neighborhoods (pattern #14), adventure playgrounds (pattern #73) to Building alcoves (#179) and Ornaments (#249). Each pattern describes what activities and experiences it can and could allow for. These recommendations are based on Alexander et al.'s professional experiences as architects and researchers studying human behavior in space.

Following a similar order, I have gathered all the affordances identified in this project under different physical categories, or patterns. The affordances are rephrased as patterns here to illustrate main themes that have emerged from the material collected in this study.

The patterns can be regarded as a form of design guidelines. However, just like Alexander's patterns, they are worded at a very general level leaving complete freedom for designers and users in terms of if, and how to integrate these patterns into their designs. Even though they are phrased in very general terms, they are by no means meant to be universal. On the contrary, as I argued earlier based on Donna Haraway (1988), design is always 'from somewhere', situated in a particular socio-cultural context, with specific users and particular requirements.

One could perhaps argue that the applied contributions of this project are very limited, providing only some suggestions very specific to a particular cultural context

(Norwegian), particular population (associated with the Informatics Department) and a very specific building type (office building designed in the last 5 decades). This is indeed the case. However, I also consider these patterns as a beginning of a conversation about the role of design for indoor mobility and regard this study as an invitation to further inquiry on affordances and mobility.

The patterns collected here include the following themes: Entrance areas, Layout configurations (including passages), Visibility, Staircases, Doors, and Technologies. Each pattern is described in terms of experiences it has been shown to afford. The experience categories follow the model developed through Chapters 4–6 and are marked here with their corresponding colors:

- Comfort and convenience;
- Sense making;
- Agency;
- Sense of being invited;
- Place identity;
- Sense of belonging;
- Aesthetic engagement.

Entrance Area

- The entrance closest to the outside transit paths was the most convenient for the participants and they tended to use it. This is a strong pattern and this study's participants often chose the closest entrance if the path that followed was neither comfortable nor convenient. To harness this affordance, designers could be encouraged to locate main entrances closest to the external transit paths.

- Participants of this study expected the indoor entrance area to be an open space, providing visual access (visibility) to the different parts of the building and providing users the affordances to understand the building. In other words, the indoor entrance area was expected to be highly integrated (in terms of space syntax measures) with highly connected vistas (axial lines), (A3, A4).

- Additionally, in particular signage, interactive technology (see more on technology in the last pattern), or other information sources (such as a person at the reception desk) are advised to be visually accessible from the entrance. As the participants of this study pointed out, these information sources can serve as additional (but not sole) support for making sense of the environment.

- In this study, entrance areas were in particular problematic. It was where the access regulation was coming to the forefront of participants experience (or 'present at hand' to use Heidegger's language) as access regulations were often not easily understood and confusing for participants. This study has shown that, if access to the building is regulated, than it is in particular important to manage the access and communicate its rules in a clear and transparent manner to those that are using the building. Providing information about access rules including contact information from those who are responsible for these regulations at the entrance could be one way of doing it. In addition, as this study has shown, designing technology that is

used in regulating access in a way that requires little if any work from the participants – yet gives them a full overview and control over it – could make entering a building less frustrating and more convenient.

- Entrance is an area where design could put particular emphasis on place identity. In this study it was achieved by designing signage that afforded a sense of distinctiveness and was marking the participants' territory (A28b);

- The place identity was also supported by introduction of interactive art/technology and other design features that were developed by the participants to bring about meaningful engagement (A27). Entrance was an area where participants would put emphasis on place identity afforded through such interventions.

Layout integration and other configuration elements

- When designing a complex building, the designers are encouraged to take into account the possibility that less integrated areas in more remote parts of a building tend not to be known and are used less by the users (A7). As this study has shown, locating functions that by definition should generate maximum movement flow in these areas (such as a library in an educational setting or a dining commons) might require particular attention to other environmental hints that would support wayfinding. Signage is an easy solution but, in itself, as this study has pointed out, it usually is insufficient to overpower mis-affordances provided by the spatial configuration (A28a).

- The size of the building matters. As participants of this study noted, larger buildings can be experienced as less convenient to move in (A24). Making mobility in larger

buildings more convenient could, for example, be supported by eliminating unnecessarily barriers (such as doors for example – A21).

- Integration made sense to study particpants. They expected that, as they moved from a more public entrance to more private areas of a building, the level of integration would decrease (A26)

- Less integrated areas were experienced as less inviting. This effect would be intensified if the less integrated spaces are narrow (A15) and dark (A14).

- However, less integrated areas could also encourage exploratory behavior – engaging participants in playful discovery (A20). This potential could be tapped into through design.

- Open spaces were experienced as inviting (A15) and worked as attractors generating mobility and social gatherings (A16).

- This mobility and social gatherings tended to create a sense of belonging in users (A17).

- However, in the situation when the only available path would cross too closely to these gatherings, it could induce discomfort (A15) in those passing by.

- The discomfort of passerby who feel as if they are invading others' space when passing closely to gatherings could be addressed when designing open spaces by, for example, providing alternative paths that allow those who move through the space to regulate their social engagement (a19);

- These alternative paths would also afford a sense of agency (a19).

- Circular paths (A8), preferably with possibilities of meaningful, aesthetic engagement (A18, A27) could support leisure walking.

- As this and other studies have shown, particular design features can decrease experienced distances: sharp turns add to experience distances (A9) while designs that engages users (through, for example, interactive art) might decrease it (A18, A27).

Visibility

- Areas having high visibility (structures with unobstructed vistas) afforded control and agency over the socio-environmental context and allowed the participants to regulate their socio-environmental engagement (A12). In other words, having an overview of what the environment provides us – gives us the options to choose where we want to go and what we want to do. Participants of this study tended to experience this as positive.

- Places to which the participants had visual access were experienced as more inviting than those that they could not see (A15, A22).

- Highly visible areas also promoted the spontaneous gathering of people (A17);

- - which in turn supported sense of belonging / being at home (A15).

- Vistas with natural light (A14) and natural environments (A18) were experienced as aesthetically pleasing and inviting and could serve to attract movement.

- As other literature has pointed out, and participants of this study indicated, while having visual access and being able to observe is experienced as positive – being observed by others could be experienced as uncomfortable (A13).

- Less visible areas were usually less used but could potentially afford exploratory behavior (A20).

Doors

- As my participants indicated, doors are experienced as barriers and are generally avoided if there are alternative paths. There were a number of levels of inaccessibility that doors created ranging from:

- a very concrete barrier because of the door's size and weight, the handles, the way in which it opened and, most importantly, the technologies embedded in doors that regulated access (card readers and other technology) (A23; A25);

- to subtle hints whether participants were invited to use the door or not – communicated through materials of which the doors are made (those providing more visibility were experienced a more inviting A21; A22) and light (if there was light behind a door – it was also more inviting).

As barriers – doors discourage mobility. In this study, when participants had a choice, they took paths without barriers. To encourage mobility – door design could include affordances that are as easy to go through as possible (not heavy, easily opened).

Staircases

- The location of stairs was crucial. If located in remote, less integrated or visually inaccessible areas of a building (as, for example, behind closed, solid door – A21, A22), they were seldom used. To encourage the use of staircases they would need to be located in easily accessible parts of the building (both in terms of layout and visual access) (A11, A15).

- As indicated by the participants of this study, some open stair treads can afford discomfort in users who suffer from fear of heights (A6). Creating open stair treads that feel safe and don't afford anxiety can be a challenge that some designers might want address given that up to 5% of the general population suffers from acrophobia (Coelho and Wallis, 2010).

- To support mobility, stair design could include affordances that decrease their perceived length. For example, spiral stairs are experienced as longer than straight ones (A10).

Interactive technology

Sometimes technology embedded in the physical space can be regarded as part of facility management after a building is completed and thus neglected in the architectural and interior design. However, with the growing emphasis on service design and smart building technology, it seems obvious that technology embedded in the physical space is becoming increasingly critical to our everyday experiences of mobility and needs to be incorporated into a conscious object of design. In particular – because, as this research has shown – it can provide a vast range of affordances for mobility experiences.

- If not designed and implemented with the future user in mind, technologies could constitute a critical barrier to mobility (A23), as they did in this research project. On

the other hand, technology also has a potential for making mobility easier by helping users understand the environment (A27b). Prioritizing users' access management in both pre- and post- occupancy design process, could lead to developing technologies of access that support and not impede mobility.

- Interactive technology can be designed in ways that that support a sense of agency in users through meaningful, active engagements as opposed to making them passive receivers/subjects of the technology (see A27 for specific design ideas provided by the participants of this study). As with other affordances this involves active participation of those affected by the design in pre and post occupancy phases.

- My participants were interested in interactive technology that could provide meaningful aesthetic experiences through actively engage users in 'doing'. Technologies that, rather than affording obligatory labor such as swiping a card when entering a building – (A23) could be fun to interact with (such as, for example playful lights that follow your movements throughout the building (A27)).

Further on, as data from this study suggests, careful design of interactive technologies could be used to support:

- a sense of being invited (A27b);

- a sense of belonging (A27a);

- place identity (A27a).

It is worth noting that technology design, or more specifically, so-called interaction design is as broad topic as architectural design is and it has initially not been the main focus

of this dissertation. However, because of the specificity of the locations and participants of this study, it has emerged as critical for design that would support everyday indoor mobility. Designing technologies to support mobility could be a topic for additional research. I hope that this dissertation has illustrated their significance for mobility in contemporary indoor spaces.

Methodological contributions and critique

Methodologically, this research has been challenging as it combined approaches that seemingly are very distant from each other. I have attempted to trace their common theoretical grounding of understanding environmental experience building on pragmatism, phenomenology, ecological psychology, social theory, and space syntax. Drawing on such an eclectic theoretical background provided me with methodological tools to choose from but at the same time restrained me from, following Harvey's quote used earlier, 'engaging in some global project'. The project became pragmatic in itself in the sense that it aimed at identifying physical affordances that influence mobility experiences and did not have the ambition of creating or contributing to theory at a 'grand' level.

The selection of various methods used here proved to serve this purpose – each in its unique way. Space Syntax – was useful in terms of configurational analysis and, combined with ethnographic data, it revealed how configuration can serve as an affordance for mobility. However, if it were used as an exclusive method, it would fail to identify other, non-configurational affordances that proved to be crucial for mobility experiences. Phenomenologically oriented ethnography allowed for thick description of both mobility experiences and environment and, although it delivered a whole array of negative experiences, it fell short in terms of identifying neutral and positive experiences that remained in the background and were not revealed. Participatory design proved to be an important method for identifying both the positive experiences and physical affordances

that were associated with them. In other words, PD allowed for revealing what in the ethnographic remained transparent and 'ready at hand' to use Heidegger's category. Participatory Design is widely acknowledged both as a design methodology aiming at creating designs and making change both in the environment and the community involved in the process. In that sense, it served its purpose well in this project. However, PD is not yet fully established as a research methodology. While it can perhaps more easily be used to investigate the social aspects of design (such as group dynamics, individual creativity, and community change) employing it as a method for identifying the physical qualities of the environment proved to be challenging. The questions that I needed to ask myself where 'what is data' and 'how will I analyze it' – issues that are more self-explanatory in more traditional social, science approaches.

Finally, this study focused on the physical qualities of the environment (affordances) and, to a large extent disregarded what some might call social affordances for mobility. In other words, I did not look at how the social environment might influence our everyday experiences on the move. And, even though some of the affordances identified did allude to the social environment, it was only analyzed in the context of the physical environment that might or might not influence this social environment in the first place (as in the affordance A16 on places where people gather that invite other people). This was dictated by a specific research interest in the physical environment, but might come across to some as a shortcoming of this research project. A possible extension of this research project could be to focus on what I would call social affordances for mobility experiences.

Walkplace: Theorethical Contributions

Throughout this dissertation, I have attempted to position my findings within a broader context of the environmental psychology research. Let me first review these contributions and then proceed to some broader theoretical implications.

First, I have attempted to show the congruency of these findings with David Seamon's work. The new model of experience categories that presented in Chapter 6, updated after findings from the participatory design study presents categories that can be likened to the categories developed in "A geography of the lifeworld: movement, rest, and encounter". Some correspond directly as, for example, 'comfort and convenience' (Seamon's 'comfort') and 'sense of being invited' (Seamon's 'invitation'). Other categories have their counterparts in Seamon's work: the category 'sense of belonging/feeling at home' is closely related to Seamon's category of attachment. I would also argue that the category of aesthetic engagement that I developed here to describe meaningful involvements with the environment (either passive as in experiencing the beauty of the natural environment or active as in, for example, play) can be loosely compared to David Seamon's diversity of uses category ('diversity'). The new category of 'place identity' is similar to Seamon's 'distinctiveness' of place which he understands as a sense of identity that makes the place distinct from the larger environmental context. The category identified here additionally includes a strong sense of pride, only implicit in Seamon's category. On the other hand, his category of attraction describing a place that people are drawn to seems to be broader and much richer than the category that emerged from these data that I referred to as 'basic positive emotional and behavioral reactions', for the lack of a better name.

Table 2

Experience categories from this study compared to David Seamon's taxonomy

this study		David Seamon's categories
basic positive emotional and behavioral reactions	<	**attraction**
comfort and convenience	=	**comfort**
sense of being invited	=	**invitation**
aesthetic engagement	≈	**diversity of uses**
sense of belonging - being at home	≈	**attachment**
sense making - being able to perceive and understand the environment or the rules governing it	>	**distinctiveness** - a sense of identity that makes it distinct from the larger environmental context
agency - a sense of having control over the environment while on the move and a sense of not being subjected to some external power or being policed in one's movements		

Two additional categories, not mentioned in Seamon's work have been added from my work: 'sense making and understanding' of the environment and 'agency'. The first is a reminder of the role that a broadly understood cognition plays in everyday mobility experiences. While shifting the focus from wayfinding to everyday mobility calls for more complex forms of socio-spatial movement analysis, cognition, understood as the totality of embodied sense making of the environment, is not be excluded from these analyses.

Finally, 'agency' is a new category of experience in terms of research on mobility experiences. However, it is not unique in the broader context of environment-behavior research. In particular the work of Cohen et al. (1986) points to the fact that lack of agency

and control over the environment can lead to what has been called 'learned helplessness'. Taken that learned helplessness has been shown to lead to frustration, distress, and even death in animals and humans (Abramson et al., 1978; Hiroto, 1974, Seligman and Beagley, 1975) it seems critical, in the light of this research, to design for mobility in such a way that it supports and not inhibits agency of users. This finding also implies that access regulation often regarded as a facility management issue should be addressed early in the planning process and involve user centered approaches in design of both physical spaces and technologies regulating access.

This research also relates to Environmental Preference theory developed by Rachel and Stephen Kaplan which argues that we prefer settings that allow for (or afford for) understanding and exploration. Although the data in this research have not been coded according to the Kaplan's theory, two categories of mobility experiences identified in this study emerged as highly relevant in this context, namely 'sense making' and 'aesthetic engagement'. This research did not aim to test Environmental Preference theory. Yet, from the findings that have emerged, it can be concluded that environmental preference as conceptualized by the Kaplans' is relevant to experiences of mobility and could serve as a possible framework for further research.

Both the Environmental Preference theory and learned helplessness theory, and, to some extent, Seamon's work on 'movement, rest and encounter' can be understood following Robert Merton's distinction (1949) as middle range theories, that is theories integrating theory and applied research. This research does yield some implications on a more 'grand' level of theoretical assertion and, in particular, for theories of place.

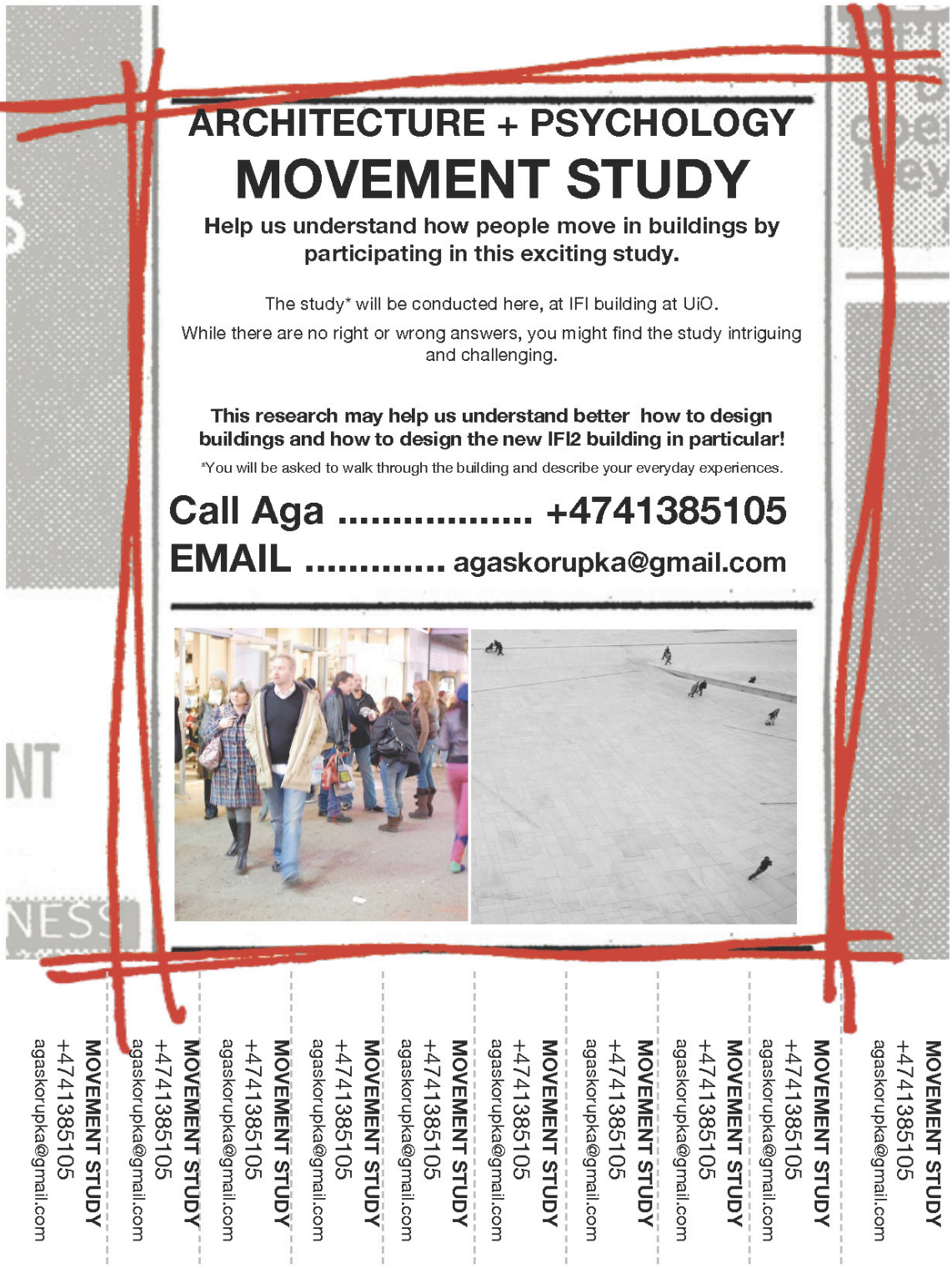
A classic understanding of place as introduced by Ti-Fu Tuan in 'Space and place: the perspective of experience' (1977) asserts that a place is a pause in the temporal current or, in other words, that places are points on one's path, centers for organization. According to Tuan, human movement in space is marked by such pauses (places). A careful read of

a recent review of place theories (see, for example Lewicka, 2011) reveals that this assumption is implicit in current theories of place. Places are largely conceptualized as meaningful locations like destinations or stops on our life journeys.

This dissertation however has shown otherwise, supporting Tim Ingold's argument that places '*are delineated by movement, not by the outer limits to movement*' (2011, p. 149). We not only assign meanings to space as we pause to experience them, but also as we experience them through our movement. The notion of 'walkplace' that guides this dissertation is used here to emphasize that, if we follow a phenomenological understanding of place as space with assigned meaning to it, then spaces of everyday mobility can, in fact, become places.

Appendix A

Flyer



Appendix B

Interview Protocol

BEFORE WE WALK

Instruction:

As you know from the information page, I am studying people's experiences of movement in buildings and how the environment can influence these experiences. We will be walking through the spaces and talking about your experiences of that movement, I will ask you to take pictures of the environment and at the very end we will together map your routes on a floor plan of the building.

Let me start with just a few questions about yourself:

- *What year were you born in?*

- *What is your status here at the university?*

- *Since when have you been coming to IFI?*

• *How often do you come here?*

•*In what times of the day?*

- *Where is your workplace located (1. if applicable, 2. To be later marked on the map).*

I am interested in the routes people choose in their everyday use of buildings. This is why I would like you to walk me through the space, using the routes that you usually take when you are here. As we walk through the space I will ask you some additional questions about your experiences of movement and the building itself.

On our way, I would also like you to take pictures of elements or characteristics of this space that (you think or feel) influence your movement in any way.

I would like to start from outside of the building and begin our walk-through conversation with your first experiences of this building. Do you remember the first time you came here? It's OK if you don't remember.

If the participant answers yes, these questions follow (the questions in light grey are additional questions to be asked if the participant is engaged in the discussion and willing to spend more time on it):

-What was the reason for you to come here?
-Did you come alone or was someone accompanying you?
-Could you please walk me though the route that you walked then.

As we walk through the space I would like you to think about and tell me about that first experience, if you can remember it (It's ok if you don't).
As we walk I'd like you to try to tell me:

- *If you can you recollect what you thought of the spaces that you were walking though.*
- *If you can you recollect how you felt walking through these spaces.*
- *If there was there anything about this space that might have influenced the way you felt?*
- *Did you experience any problems or issues with finding your way to your destination? If so, what and why?*

AS WE WALK
(first time visit)

As we walk I will not be asking the questions, not to disturb the flow of movement.
I will however, if needed, be following up on what the participants' answers.

WHEN WE STOP
to take a photo or a to describe an alternative route
(first time visit)

- *What are you taking a picture of? How was your experience of movement influenced by ...[what the participant is taking a picture of]?*

AT THE DESTINATION
(first time visit)

In case the participant did not talk while walking: Reflecting back at the route with the initial set of questions:

- *If you can you recollect what you thought of the spaces that you were walking though.*
- *If you can you recollect how you felt walking through these spaces.*
- *If there was there anything about this space that might have influenced the way you felt?*

Unless the participant talks about their positive/negative experiences on the way, these questions should be asked at the "destination", reflecting back at the route:

- *Is there anything on the way that made the walk pleasant?*
- *Is there anything on the way that made the walk unpleasant?*

- *Did you experience any problems or issues with finding your way to your destination? If so, what and why?*

- *Do you ever experience any problems or issues with finding your way to your destination in your daily uses of the space now?*

BEFORE WE WALK
(the daily routes - to workplace/class)

I would like to now ask you to walk me through the usual routes you use during the your day here. Lets start outside and walk through the space as you usually do when you come here (to your work/ to your class) on your regular - where do you enter the building?

- *When you go to .... why do you walk this way?*
- *Are there other routes that you could take?*
- *If so, why do you choose to use this route rather than another?*

I am also interested in if you ever stop on your way?
- *If so, where and why? To do what?*

As we walk I'd like you to try to tell me about your experience of this space. In other words I am interested in what do you think and feel about the space you walk through.

I would be interested in learning if there is anything about the space, and in particular about its architectural characteristics, that might influence the way you feel as you walk through here. In other words, are there any particular elements of the environment that are in any way important for your experience of movement?

Do these questions make sense to you? It it clear?

AS WE WALK
(the daily routes - to workplace/class)

As we walk I will not be asking the questions, not to disturb the flow of movement.
I will however, if needed, be following up on what the participants' answers.

WHEN WE STOP
to take a photo or a to describe an alternative route
(the daily routes - to workplace/class)

Picture:
- *What are you taking a picture of? How was your experience of movement influenced by ...[what the participant is taking a picture of]?*

Alternative route:
- *On what occasions do you choose to go this way? Why do you choose to use this route rather than another?*

AT THE DESTINATION
(the daily routes - to workplace/class)

Reflecting back at the route:

In case the participant did not talk while walking: Reflecting back at the route with the initial set of questions (these only come in, if the participant has not answered them while walking):

- *When you go to .... why do you walk this way that we just walked.*
- *Are there other routes that you could take?*
- *If so, why do you choose to use this route rather than another?*
- *Do you ever stop on your way?*
- *If so, where and why? To do what?*
-
- *Can you try to describe the experience of walking though this space? What I mean by that is I am interested in what do you think and feel about the space you walking through.*
-
- *Is anything about the space, and in particular about its architectural characteristics, that might influence the way you feel as you walk through here? In other words, are there any particular elements of the environment that are in any way important for your experience of movement?*

Unless the participant talks about their positive/negative experiences on the way, these questions should be asked at the "destination", reflecting back at the route:

- *Is there anything on the way that made the walk pleasant?*
- *Is there anything on the way that made the walk unpleasant?*

- *Did you experience any problems or issues with finding your way to your destination? If so, what and why?*

About the destination:

- *What do you do here?*
- *How much time do you tend to spend here?*

Then repeat this process with:

> a route participants take to eat lunch
- *Do you eat your lunch here? If so, could you walk me though the routes you take to have lunch?*

> a route to the use a bathroom
- *You have not mentioned if you use bathrooms here. Do you use bathrooms here? If so, could you walk me though the routes you take to use a bathroom.*

> other routes of daily use

3. TRACKING

Thank you for walking me though your everyday routes. That was very interesting and informative. Perhaps we could sit down now and sum up what you just showed me on a map, where we could mark your movements.
This is a map that represents the spaces that we were walking though. I suggest that we draw the routes that you just showed me.

4. PHOTOGRAPHS

The last thing that I would like us to do together is to go though the pictures you have taken and talk about them.
- I am in particular interested in what it is that you took a picture of and how it relates to your experience of movement?

Thank you for talking to me, sharing your experiences, and for your time.
As you will be further using this space I would like to ask you to contact me if there is anything else that you would like to share with me. It would be very useful for example, if, as you are further using the space you might want to add some more comments about your daily experience of the spaces or perhaps take additional photos. I would appreciate if you would like to share these with me. You can email me at agaskorupka@gmail.com.

Appendix C

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