Towards the Affect of Intimacy

by

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Abstract

This thesis explores the trajectory that the developing technological fields of Ambient Intelligence and Persuasive Technologies introduce new intricate relationships beyond fundamental use and availability because they change our abilities to act.

Since its classic articulation by Hegel (1927) philosophical explication of the relationship between people and technology states that technology is a mediating factor between people and the world. Associated with this view, which has characterized the resulting phenomenology and philosophy of technology for nearly two decades, is an understanding of technology as a form of alienation. In this dissertation the author shows how this old interpretation of the relationship between a person and their tool has emphasized how the person is active whilst the tool is passive. This traditional distinction fails to grasp the complex interaction between people and technology in the contemporary world.

The nature of new technologies and novel theoretical work in this field suggests that this critical framework is now inadequate. Today, technology mediates the relationship between people and the world in increasingly complex and often collective ways. McLuhan (1967) stated: "Media evoke in us unique ratios of sense perceptions. The extension of any one of these senses alters the way we think and act". As Greenfield (2006) and Fogg (2002) also posit, certain Ambient Intelligence and Persuasive Technologies are in-principle shaping everyday human behaviours in radically new ways.

In particular, I explore how new technologies like those developed in the Artificial Companions Project can impact on our understanding of *intimacy* and *identity*. Indeed, Ambient Intelligence Technologies may play the role of *reference groups* (Shibutani 1987), groups who are real or imaginary and whose standpoints are being used as the frame of reference for the human actor. Given that these technologies have continuously reconfigured identification and profiling practices, this analysis rephrases insight of philosophers like Paul Ricoeur (1990), George Herbert Mead (1959) and Helmuth Plessner (1975) to trace how: *The construction of our identity is mediated by how we profile others as profiling us.*

Thus, new technologies can become reference groups, encroaching on our everyday activities and even affecting our moral decision-making processes. As genuine upgrades of our practical space, they are destined to play a larger *formative role* in people's lives in the future. Following Heidegger in *Das Ding* (Heidegger 1951), Latour once framed the wider social role of technologies as *res publica* or 'public things' (Latour 2005). He pointed out that the old German word 'ding' etymologically did not only infer 'material object' but also to *assembly* as gathering space - that thing that can bring together what it separates. Following Latour, Verbeek states that technological 'things' do not only mediate our existence, but are places where these mediations are made explicit – therefore, Verbeek argues, they are the places where people have to start to discuss and criticise the quality of the ways in which these 'things' help to shape our daily lives (Verbeek 2008). This thesis attempts to offer a new approach to this criticism through theoretical comparison and transdisciplinary analysis.

Executive Summary

The development of new technologies in the form of Ambient Intelligence (AmI) and Persuasive Technology raises important questions about the technological mediation of reality and of human subjectivity. In particular, these technologies challenge Western society's dominant cultural frameworks concerning the related concepts of intimacy and identity, which jointly suggest that there is a more complex mediating relationship between people and technology in twenty-first century societies than is often assumed. This thesis takes a phenomenological approach to presenting a critical analysis of the way in which AmI can be said to mediate human identity in significantly new and radical ways.

The thesis is arranged in 2 broad sections. After an introduction to the specific characteristics of Ambient Intelligence in Chapter 1, Chapter 2 and 3 aim to introduce the reader to various concepts of human-technology relations from a phenomenological, sociological and ontological perspective in order to shed light on the ways how these intimate technologies shape human behaviour and by this affect human identity.

During the 21st Century smart technologies are changing people's sense of their potentials, affecting who they are and who they might become. Therefore, the second part of the thesis, Chapters 4, 5 and 6 explores many concrete ways in which these technologies rebound on our sense the self.

In Chapter 1, it will be argued that pervasive technologies represent a significant turning point for society, technologists and philosophers of technology alike. It establishes the context for the study of technological mediating through sketching recent developments in the field of Ambient Technology (AmI). It will provide the reader with a general discussion and evaluation of Ambient Intelligence, the vision of the technological future developed by Philips and endorsed by the European Commission. The chapter will present an overview of the key literature that has been written with regard to this vision and present a picture of its most important characteristics.

Chapter 2 offers a choice overview of the phenomenological and philosophical literature concerning technological mediation as it has developed over the last century. It offers a sketch of the influential approach of Heidegger, and accepts the premise that any investigation into the rule of technology must begin from the assumption of the interrelatedness of people and the shared lifeworld. It considers the development from classic phenomenology to post-phenomenology, and presents the human-technology typography offered by Ihde, arguing that this captures the more complex roles that particular artifacts can play in everyday social situations.

Chapter 3 goes onto to develop an analysis of technological artifacts qua scriptural forces in some detail. It defends a reading of scripts as materialized rules expressed in the shared social environment. This captures in more detail the specific role of mediator that technologies can play and draws on the insight that technologies qua scripts are social constructions, with cultural meanings that are changeable and contestable.

Chapter 4 presents the psychological process of attachment and offers a reading of particular technological artifacts qua transitional objects. On this reading, adults can enter into intimate emotional relationships with particular technologies, which allow them to develop their personal and social identities through mediating their relationship with both the world and themselves in particular ways. The Chapter presents a number of empirical studies which suggest the extent of emotional relationship that people can be said to have with particular kinds of technology.

Chapter 5 elucidates a philosophical framework for understanding the construction of identity, following Ricoeur. It introduces the idea of idem and ipse identity, and the idea of the narrative self as the locus of interaction of the two. This allows for a sensitive reading of the role of particular AmI in allowing for the construction of – and mediation of – personal identity. On this reading, technologies are understood qua reference groups, which allow people to define and articulate themselves in particular kinds of ways.

Chapter 6 continues this analysis, and explores in more detail the sense of 'blurring' that arises in contemporary relations of mediation with AmI and more developed technologies. It draws out how there has been an ambivalence about the role of technology in the literature since the modern period, and argues that technology has, and continues to, co-shape the world and identity in radical new ways.

In this thesis I have embedded links to an online-archive in order to enable the reader access many examples on related topics. This archive represents an important part of my Phd-research and should function as a resource for other researchers. Throughout this thesis I have collected a great deal of information on smart technology, talks, conferences, books and projects related to the subject. Consequently each archive link is marked with 🗩 and all the collected links embedded in this thesis are available for the reader on the enclosed CD (for direct access).

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Introduction

The purpose of this thesis is first to critically explore the various mediating roles that 'intelligent' technologies - Ambient Intelligence and Persuasive Technology - play in personal identity formation, and second to assess the various ethical questions and issues raised by the way in which intelligent technologies can be said to mediate personal identity in practice. The thesis deploys a broadly phenomenological paradigm which implies a particular methodological approach that emphasizes the close interconnections between technologies and the social roles they inhabit and takes as its primary object of study the individual's subjective experience. Overall, I seek to articulate a robust philosophical framework that makes good sense of the way that smart technologies mediate personal identity, and to outline the relevant ethical issues arising from this particular form of this mediation and give some indication of how to resolve them.

In particular, the thesis seeks to ascertain whether it is theoretically possible to make sense of the claim that a relationship of *intimacy* can be said to obtain between smart or persuasive technologies and their users in certain circumstances, as seems often suggested by the primary literature. It is not obvious in what sense exactly it is true to say that a human-technology relationship is 'intimate', given we tend to think that intimacy can only exist between two self-conscious subjects – or people, whereas smart technologies are only mere objects, albeit sophisticated technologies. It is therefore an interesting philosophical question whether it is legitimate to extend our concept of *intimacy* to people's relationships with smart technologies in certain cases. The issue is salient to the purpose of thesis since it concerns how to make sense of the traditional distinction between the technology *qua* object and the person *qua* subject. The thesis thus addresses whether there is anything special or unique about smart technologies that renders them capable of entering into more complex and intimate relationships with their users. It also has the secondary aim of exploring how the sorts of relationships people can enter into with smart technologies respond to and shape our ideas of intimacy as a society.

More specifically, the thesis locates itself relative to several pertinent philosophical, political and ethical discussions that are ongoing, both in the wider society and in the academic literature, that have a direct bearing on the emerging field of smart technology and its role in mediating personal identity. The traditional view of technology, especially that which can be used in the home to perform certain domestic tasks, tends to see it as a liberation, freeing up people from the drudgery of monotonous and time-consuming tasks. However, within the contemporary period, a number of thinkers have pointed to the more negative role that technologies can play, pointing to the way in which they could be propagate unjust systems of control, infringe on people's privacy and so on. In particular, intelligent domestic devices – for instance the well-established example of the 'smart house' - can also be said to to take on the *management of life* as their object; in this, they go beyond the traditional role of domestic technologies. A central claim of this thesis is that:

> (C1) Intelligent technologies challenge conceptual and practical borders between people and technological objects and ask for an expanded understanding of responsibility.

I take this also to imply, in the strongest sense, a subsidiary claim:

> C2) Intelligent technologies define new contexts for ethical actions - our abilities to act are regulated and disciplined by multiple strata of technological devices in the artifactual environment.

The thesis thus seeks to substantiate and explore the above claims, considering possible objections and critically evaluating the relevant literature. The second claim in particular leads to a more thorough examination of the way in which technology plays a *mediating role* in our everyday lives and interactions. Here, the purpose the thesis is broadly to outline the various ethical issues at play, to explore the different actors who could be said to have various forms of responsibility and to articulate the way in which ethics can help us to assess and experiment meticulously with the technological mediation of life.

Finally, the two claims above link to two different though related lines of investigation throughout the thesis: on the one hand, a more explicitly philosophical examination of personal identity formation, where smart technologies are understood as mediating personal identity; and on the other, a more explicitly ethical exploration of the various practical issues and questions connected to the design and deployment of smart technologies in contemporary life.

Specific objectives

While there are a number of philosophical and more explicitly moral lines of investigation, as stated above, there are also a number of more specific objectives that the thesis attempts to address. These can be grouped in a rough way into 'theoretical' and 'practical' objectives which comprise two lines of investigation that run throughout the thesis. The more 'theoretical' objectives concern the first more philosophical line of investigation that runs throughout this thesis; the more 'practical' objectives concern the more explicitly ethical exploration that runs throughout the thesis - although these two lines of investigation are intimately related and often explored in tandem: it is best to understand them as two different aspects of the same overriding investigation. These specific objectives, loosely grouped into 'theoretical' and 'practical' can be summarised as follows;

> (**TO1**) To understand the emerging field and use of 'persuasive technology' within a meaningful theoretical framework - drawing in particular on a phenomenological perspective - that sees technology as a *mediation* of *human subjectivity* and society. The aim is to understand:
>
> > (a) the precise meaning of 'technological mediation' and whether it is possible to distinguish different types of mediation;
> >
> > (b) the differences and similarities between human and technological agency and intentionality.

(**TO2**) To analyze personal identity construction in relationship to ambient intelligence and persuasive technologies from various relevant theoretical or philosophical perspectives, with the aim of sketching a meaningful philosophical framework that is relevant to intelligent technologies in particular.

(**TO3**) To apply Foucault's study on moral self-constitution to the function of intelligent technology in general and persuasive technologies in particular, to explore how far intelligent technologies can be seen as a form of subjective freedom, properly understood.

(**PO1**): To offer preliminary conceptual guidelines, drawing on the results of TO1-3 above, that will articulate an ethical framework to be used by the designers of ambient intelligence and persuasive technologies.

(**PO2**): To assess the various ethical issues surrounding by profiling machines in particular (data mining), to explore how such technologies may impact upon identity formation and to sketch possible practical implications.

(**PO3**): To understand how to assign ethical responsibility to humans when their identities and actions are mediated by ambient intelligence and persuasive technologies.

The thesis can thus be understood as following to broad lines of investigation: on the one hand, it aims to articulate a suitable critical philosophical framework that explains how intelligent technologies play a mediating role in personal identity formation, and thus to explore the emerging field of ambient and smart technologies from a broader phenomenological perspective concerned with people's experiences of such technologies and in particular their experiences of intimacy. On the other hand, the thesis aims to articulate a suitable critical and philosophical framework that offers a good way of

making sense of various practical and ethical problems often raised in connection to the design and use of intelligent technologies in society, especially those concerning responsibility, freedom and control.

Research methodologies

This thesis analyzes the function and ethical consequences of intelligent technologies from the broad theoretical paradigm suggested by the academic discipline of the philosophy of technology. This broad approach is justified by an appeal to the overall purpose of the thesis, which holds that beyond naïve optimism and ideological pessimism, the philosophy of technology has developed insightful ways to investigate the actual implications of specific technological devices and to speculate about what this means for the social world.

The research methodology of this thesis is thus to carry out a broad literature review of the relevant literature. As the field of smart technologies is relatively recent and yet to be formalised into an academic discipline, the literature review his covered a broad range of academic subjects and areas of research relevant to the focus of the relationships people forge with technologies in general and those they form with smart technologies in particular. The literature review has considered texts from the following disciplines: philosophy, cultural theory, anthropology, sociology and business. In particular, I draw on the phenomenological inquiries of Don Ihde and the anthropological observations of Bruno Latour, and on the critical reconstruction of their work by Peter–Paul Verbeek. Verbeek provides a critical link to technological persuasion, because he assesses the morality of *things*. In later chapters, I also explore the work of the philosopher Paul Ricoeur and the ideas of Michel Foucault concerning self-practice.

However, as the thesis constructs a broad argument throughout its chapters, the literature review is not contained within a separate chapter before the main work of the thesis; rather, each chapter draws on different areas of the relevant literature, organised into a logical progression of topics that cast light on the argument made. In particular, the thesis

has explored seminal texts within the philosophy of technology that have played a key role in shaping the discipline as it has developed throughout the twentieth century. It draws on phenomenology in particular to cast light on the relationship between people and technologies, and follows the academic literature in drawing in particular on recent developments in the field into what has been called 'post-phenomenology'.

Furthermore, as this thesis comprises a philosophical study, it does not collect empirical data or make conclusions that could be considered empirical. However, it does see fit – where relevant – to draw on recent empirical studies that have aimed to explore the relationship between new smart technologies and their users. This is because, as stated previously, the field of smart technologies is a relatively new one, while the use of smart technologies is by no means widespread in society. The current thesis thus has an experimental character, in the sense that it attempts to theorise a new area of technology and human experience. Accordingly, the empirical data is drawn from two sources. The first concerns relevant studies in the literature; it must be stressed that these studies often have a partial character, or else do not necessarily explore the variables strictly useful for my purposes. The thesis therefore does not base strong conclusions on these studies, but rather seeks to draw on and interpret studies in an intelligent and hopefully useful way, insofar as they are relevant to the main argument. The second source of empirical data is more problematic, and concerns relevant companies who have been developing smart technologies. This data is problematic because it may show bias as it is not academic work, and often is used for marketing and funding-application purposes. However, such data is invaluable and indeed necessary to offer a brief understanding of what smart technology is and how it currently operates. This empirical data is therefore drawn upon, albeit cautiously.

Theoretical approach

The thesis draws on the work of the phenomenologists outlined about to articulate its theoretical approach. Specifically relevant to its purpose, the thesis contends that technological persuasion can be seen as a specific manifestation of the more

encompassing phenomenon of technological mediation. This latter concept indicates the ways in which technologies inevitably, and often implicitly, help to shape human actions and perceptions by establishing relations between users and their environment. An important idea that influences the thesis' theoretical approach is the theory of mediation, as articulated in Verbeek (2005, 2006), is that technologies should not be understood as functional instruments, but as active mediators in relations between humans and reality.

This approach makes it clear that in order to understand implicit normative effects of ambient intelligence and persuasive technology, a technology may never be seen purely as instrumental, but always as mediatory. Persuasive devices are more than devices that persuade people so that they must drink and smoke less, sleep enough, work less hard, lead a more regular life. An instrumental vision hides the fact that not only does this technology fulfil its function (persuade people of the advisability of behavioural change) but also imposes an implicit normative framework and organizes its environment in a specific way. Further, this post-phenomenological approach provides a more nuanced way of understanding the implications of mediation for design and ethics (Friedman, 2004; Friedman, Kahn, & Borning, 2002; Verbeek, 2005) in the context of these technologies.

In order to discuss the complex relation between these identity-related information technologies like Ambient Intelligence and Persuasive Technologies and the experience of one's moral identity I opt for a philosophical and sociological approach, leading to a relational and non-essentialist understanding of human identity. In speaking of a relational conception of identity we acknowledge that the construction of the self is not something we accomplish on our own, but which happens in the constant and often unexpected interactions with one's human and non-human environment. For the purpose of this thesis it is important to move beyond purely social constructivist approaches to identity: I aim to explore how the interaction with non-human profiling (i.e., automated profiling that 'runs' without human intervention) impacts identity. Applying the concept of double anticipation helps me to finally understand these technologies as frames of reference in the construction and expression of our identities.

Notes on my online-archive

The methodology underlying the main thesis has been coupled with an ongoing process of developing a web archive throughout the duration of my research. I have compiled a web archive of relevant research materials that, for whatever reason, were not included in the final dissertation. In particular, various online conservations with visitors of the weblog shaped the development of my thinking, giving rise to contingent digital publics emerged around various concerns. The weblog became a tool for focusing, exchanging information and discussing with people beyond the academic community. A tool to think about my research, its values and to consider in which ways my research connects to other aspects of the world.

Following the concept of Foucauldian case histories, which emphasises partiality and internal intelligibility, my weblog is organised around particular case histories about smart technologies relevant to the research. Here, case histories 'neither 'demonstrate' metaphysical positions, nor do they reconstitute the analysand's past as a [final] 'history'... [Instead they] make a problem intelligible by reconstituting its conditions of existence and its conditions of emergence' (Cousins and Hussain 1984:3). From this perspective, the weblog provides a compelling way of organising the case histories in order to help to bring to light various connections and mappings between the different areas of research. The weblog has been to "designed around chains, paths, threads, conjunctions, or juxtapositions of locations" (Marcus 1995:105). While this approach is not necessarily appropriate for the final thesis, it has provided a useful and stimulating focal point for broader reflection and connection, that has helped to shape the contours of my argument and concerns. It has also hopefully helped to stimulate some of the wider social and public discussion that this thesis holds, enabling people to better understand the mediating roles of technologies around them.

Target audiences

The target audience of the thesis is twofold, reflecting the two lines of investigation pursued. First, this thesis aspires to contribute to existing knowledge, and locates itself relative to literature that explores the emerging relationships between smart technologies and their users in the twenty-first century. In particular, the thesis takes a phenomenological approach, and draws on seminal contemporary philosophers in the field. The thesis thus aims to contribute to academic knowledge; accordingly, the target audience is both academics in the relevant fields alongside any other interested parties. Second, this thesis may be of relevance to those working practically within the emerging field of smart technologies, such as designers and various other stakeholders. The thesis does not proffer practical advice, but rather aims to throw light on various philosophical and moral issues connected to the design and deployment of smart technologies, especially in the later chapters. While there is some discussion of relevant policy frameworks in the final chapters, this thesis does not primarily focus on governments as its target audience. However, some of the discussion and arguments deployed here are sensitive to – if not explicitly critical about – various assumptions understanding current policy in this area. The thesis could thus be of interest to policy-makers or other interested or concerned members of the public.

Routemap

What follows is a routemap of the thesis outlining the overall trajectory of the argument, relating to the overall purpose and specific goals of the thesis.

Chapter 1: Living in a world of everyday smart objects. This is an introductory chapter that introduces the concept of 'smart technology' through a brief investigation of a number of key examples from the academic and trade literature, focusing on Persuasive Technology and Ambient Intelligence in particular. Its overall purpose in relation to the trajectory of the argument of the thesis is to substantiate its two central claims, namely 'C1' and 'C2' above. The chapter thus attempts to show that smart technology represents a

significantly *new departure* from previous technologies in ways salient to the thesis' purpose, and explores how this influences issues concerning identity, intimacy and the grounds for ethical action in particular. It draws on the 'five characteristics' of Ambient Intelligence as defined by Philips, gives a brief contextualisation of the social role of smart technologies in practice, explores a number of specific examples currently in development and then appraises the implications of these developments in terms of profiling and privacy, and control and influence. The overall function of the chapter is thus to lay the ground for the investigation in later chapters into the various ways that intelligent technologies blur the traditional boundaries between people and things (C1), and hence change the grounds for ethical responsibility and action (C2).

Chapter 2: Technological Mediation. This is a theoretical chapter that considers the relevant literature concerning the concept of technological mediation, exploring how this mediation is traditionally conceptualised and considering how this conceptualisation might be challenged when applied to intelligent technologies. In relation to the overall trajectory of the argument in the thesis, the chapter explores in critical detail the first central claim, that smart technologies blur the traditional boundaries between people and things (C1). In terms of specific objectives of the purpose of the thesis, this chapter aims to fulfil (TO1): To understand the emerging field and use of 'persuasive technology' within a meaningful theoretical framework - drawing in particular on a phenomenological perspective - that sees technology as a *mediation* of *human subjectivity* and society. The aim is to understand: (a) the precise meaning of 'technological mediation' and whether it is possible to distinguish different types of mediation; (b) the differences and similarities between human and technological agency and intentionality. This chapter also offers a more detailed justification of the specific methodological and theoretical approaches taken by the thesis as a whole.

Chapter 3: Semiotics of Technologies. This chapter begins to move from the more explicitly theoretical considerations of Chapter 2 to consider more specifically the particular social functions of persuasive technologies in practical use. In terms of the overall trajectory of the argument in the thesis, it is an extension of my analysis of the

claim (C1) that intelligent technologies blur the traditional boundaries between people and things, and pertains to the specific objective (TO1): To analyze personal identity construction in relationship to ambient intelligence and persuasive technologies from various relevant theoretical or philosophical perspectives, with the aim of sketching a meaningful philosophical framework that is relevant to intelligent technologies in particular. In particular, this chapter does the bulk of the work in 'sketching a meaningful philosophical framework' for intelligent technologies, developing a nuanced reading of intelligent technologies *qua* scriptal forces. This leads onto a preliminary laying of the ground for an exploration of the thesis' second central claim (C2), that intelligent technologies change the grounds for ethical action and decision-making, especially concerning ethical responsibility. In particular, it begins to look at the specific practical objective (P03), how to assign ethical responsibility to people using smart technologies in particular ways.

Chapter 4: Intimate Technologies –Relationships with Technological Objects. This is the more 'empirical' chapter of the thesis, which draws on relevant studies to establish and develop (TO2), to analyze personal identity construction in relationship to ambient intelligence and persuasive technologies from various relevant theoretical or philosophical perspectives, with the aim of sketching a meaningful philosophical framework that is relevant to intelligent technologies in particular. This chapter thus relates to the trajectory of the argument of the thesis as an elongated case study, in particular drawing out the argument's concern with *intimacy* between smart technologies and their users and explaining its relevance in substantiating the main claim (CO1) that smart technologies fundamentally challenge our traditional understandings of the division between people and things, and hence to lay the foundations for a proper investigation into both (C2) and the more practical considerations concerning responsibility and design.

Chapter 5: (Digital) Technologies of the Self. This chapter assumes that the central claims (C1) and (C2) of the argument of the thesis have been established. It relates to the overall trajectory of the argument by examining in detail both the practical ethical concerns

relating to smart technologies and the peculiarities of profiling and identity mediation. The main theoretical work of the chapter, in relation to the overall argument and specific aims of the thesis is to establish (TO3): To apply Foucault's study on moral self-constitution to the function of intelligent technology in general and persuasive technologies in particular, to explore how far intelligent technologies can be seen as a form of subjective freedom, properly understood. The main practical work of the chapter is intimately related to this theoretical work, and is to fulfil (PO2): To assess the various ethical issues surrounding by profiling machines in particular (data mining), to explore how such technologies may impact upon identity formation and to sketch possible practical implications. The chapter thus relates to the trajectory of the overall argument by moving into a specific study of the application of Foucault's ideas about 'self-care' and the particular role and function of profiling technologies. It represents the most in-depth exploration of the central claim (C1).

Chapter 6:Ambient Persuasion – Designing for Behaviour. This chapter fits into the overall thesis by being the most in-depth exploration of the central claim (C2) concerning how intelligent technologies change the grounds for ethical action and responsibility, as well as exploring the implications of (C1) to this end. In terms of specific objectives, it aims to fulfil PO1: To offer preliminary conceptual guidelines, drawing on the results of TO1-3, that will articulate an ethical framework to be used by the designers of ambient intelligence and persuasive technologies; and to fulfil PO3: To understand how to assign ethical responsibility to humans when their identities and actions are mediated by ambient intelligence and persuasive technologies. The chapter thus explores the various aspects and considerations at play from the point of view of designing intelligent technologies, bringing together the two overall lines – theoretical and practical - of investigation of the thesis.

The following page presents a diagram illustrating the central issues of the routemap and outlining the overall trajectory of the argument, as discussed in the different chapters of the thesis.

Routemap: Overview

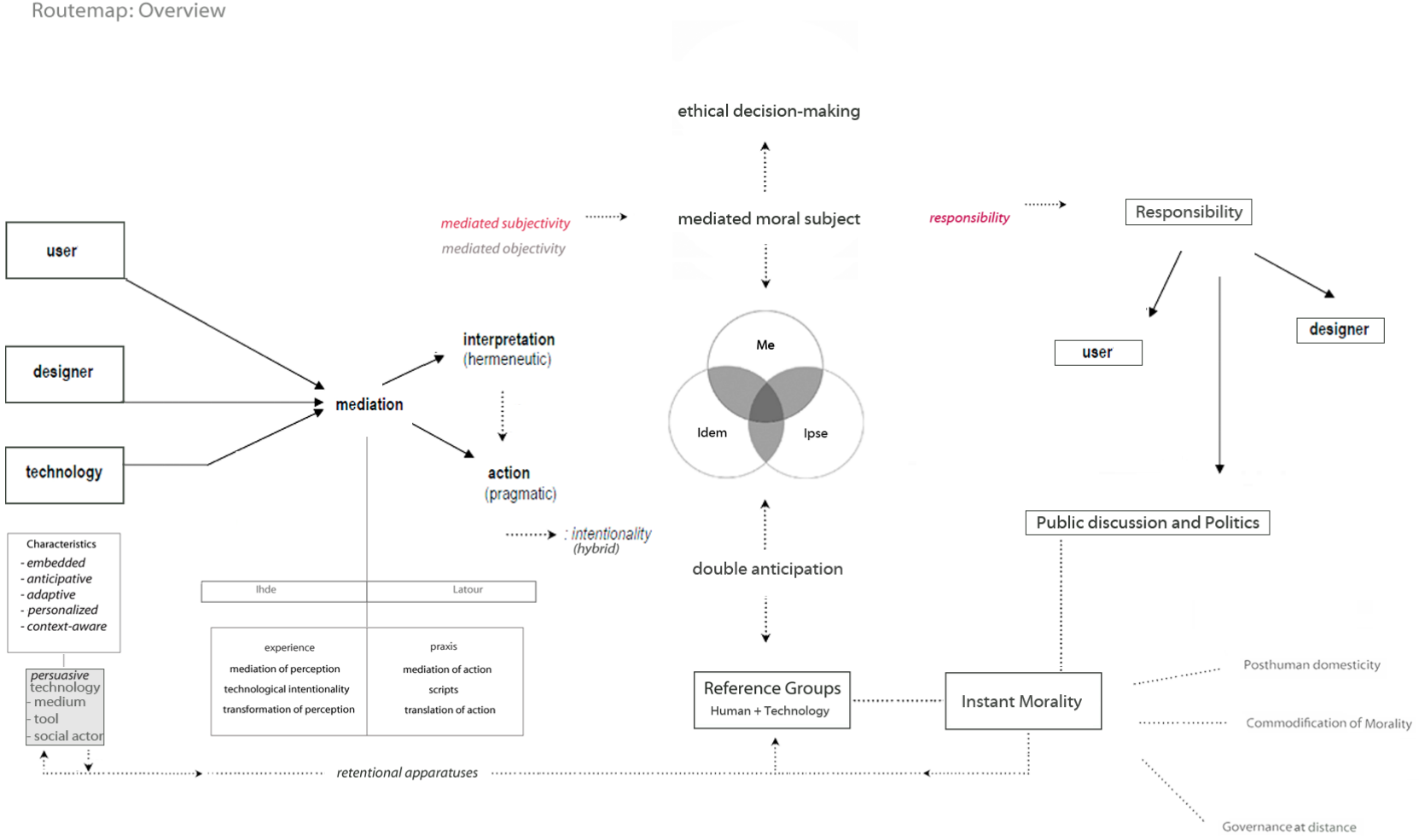

Fig. 1 (Moritz 2011)

Chapter 1: Living in a world of everyday smart objects

> [Ambient Intelligence's] presence in our lives will transfigure our notions of space and time, self and other, citizen and society in ways what we haven't begun to contemplate. (Greenfield, 2006:3)

1.1 Introduction

This is an introductory chapter that introduces the concept of 'smart technology' through a brief investigation of a number of key examples from the academic and trade literature, focusing on Persuasive Technology and Ambient Intelligence in particular. Its overall purpose in relation to the trajectory of the argument of the thesis is to substantiate its two central claims, namely 'C1' and 'C2' above. The chapter thus attempts to show that smart technology represents a significantly *new departure* from previous technologies in ways salient to the thesis' purpose, and explores how this influences issues concerning identity, intimacy and the grounds for ethical action in particular. It draws on the 'five characteristics' of Ambient Intelligence as defined by Philips, gives a brief contextualisation of the social role of smart technologies in practice, explores a number of specific examples currently in development and then appraises the implications of these developments in terms of profiling and privacy, and control and influence. The overall function of the chapter is thus to lay the ground for the investigation in later chapters into the various ways that intelligent technologies blur the traditional boundaries between people and things (C1), and hence change the grounds for ethical responsibility and action (C2).

Envision the following scenario:

> Arriving home, a surveillance camera recognizes the young mother, automatically disables the alarm, unlocks the front door as she approaches it and turns on the lights to a level of brightness that the home control system has learned she likes. In the house, the bathroom mirror is more than just a reflective surface – it is also a digital 'health assistant' that advises users on weight management, dietary habits, on dental care and exercise programs. The windows of the house are able to change the amount of sunlight they let through depending on the weather conditions outside. The electrical equipment of the house is 'smart'.
>
> After dropping off her daughter at home, the young mother gets ready for grocery shopping. The intelligent refrigerator has studied the family's food consumption over time and knows their preferences as well as what has been consumed since the last time she went shopping. This information has been recorded by an internal tracking system and wireless communication with the intelligent kitchen cabinets. Based on this information, the refrigerator automatically composes a shopping list, retrieves quotations for the items on the list from five different supermarkets in the neighborhood through an Internet link, sends an order to the one with the lowest offer and directs the young mother there. (Source: Raisinghani et al. 2004).

http://playstudies.wordpress.com/2011/05/10/living-tomorrow/

In an increasingly networked world where mobile and online interconnections have become woven into the structure and function and the very fabric of everyday life the prospect of such an ambient intelligence is one that is becoming more realistic. In June of 2003 an interactive house as described above, was built by Philips, entitled '*Living Tomorrow'* . Envisioned as a 'home of the near future', this project provided a number of technological systems, artifacts and applications that designers and developers of consumer electronics anticipate will enter our homes in the next decades. Lindwer et al. describe the Ambient Intelligence Vision as follows:

> Ambient Intelligence (AmI) is the vision that technology will become invisible, embedded in our natural surroundings, present whenever we need it, enabled by simple and effortless interactions, attuned to all our senses, adaptive to users and context and autonomously acting. High quality information and content must be available to any user, anywhere, at any time, and on any device. (Lindwer, et al., 2003: 1)

This tendency is evidenced by the fact that European Commission (ISTAG 2001) and others bodies have posited various affects that Ambient Intelligence (AmI) has on the future of society. As a report entitled, *Science and Technology Roadmapping: Ambient Intelligence in Everyday Life* by ESTO, The European Science and Technology Observatory states,

> The concept of Ambient Intelligence,…provides a vision of the Information Society future where the emphasis is on user friendliness, efficient and distributed services support, user-empowerment, and support for human interactions. People are surrounded by intelligent intuitive interfaces that are embedded in all kinds of objects and an environment that is capable of recognizing and responding to the presence of different individuals in a seamless, unobtrusive and often invisible way. (Friedewald and Da Costa, 2003: 7)

http://playstudies.wordpress.com/?s=ambient+intelligence
http://playstudies.wordpress.com/?s=internet+of+things

This vision is one that stems from the view that the technological possibilities and interactive communications, encompassed in this technology can be extended and expanded to develop new functional concepts of life, living and reality. The trajectory of this view includes the following central facets that will be explored and discussed in this chapter.

1.2. Ambient Intelligence

In essence, the intention of ambient intelligence and technology is to apply sensors to various objects or surfaces in the home as well as in public environments. These sensors use various software algorithms to enable and facilitate communication and the exchange of data.

The key elements of ambient intelligence are defined as follows:

- embedded: many networked devices are integrated into the environment
- context aware: these devices can recognize you and your situational context
- personalized: they can be tailored to your needs
- adaptive: they can change in response to you
- anticipatory: they can anticipate your desires without conscious mediation.

(Aarts and Marzano, 2003:14)

In respect to the encompassing vision of ambient intelligence, these core elements provide an intimation of the integrated and integrative view of interconnections between human life and technology. Fundamental to this view is the idea of a 'smart environment'. This includes sensor technologies, RFID systems, nanotechnology and miniaturization. These technologies constitute what has been termed *The Internet of Things* (ITU 2005).

A straightforward and somewhat simplistic view of the origins the 'Internet of Things' is as follows. The term Internet of Things appears to have been coined by a member of the RFID (Radio-frequency identification) development community in 2000. This refers to the

> … the possibility of discovering information about a tagged object by browsing an Internet address or database entry that corresponds to a particular RFID. Since that time, visionaries have seized on the phrase 'Internet of Things' to refer to the general idea of things, especially everyday objects, that are readable, recognizable, locatable, addressable, and/or controllable via the Internet—whether via RFID, wireless LAN, wide-area network, or other means. (ITU Internet Reports 2005: The Internet of Things)[1]

What is central to the literature on this subject is the sense of a new and exciting era in the development of computer technology and communication; as well as a new era of possibility in terms of human consciousness and the way that we interact with our environment and ourselves.

This of course brings into play many complex and contentious issues, such as the question of human identity, control and manipulation, security and privacy, as well as a myriad of other concerns that are raised by the potential that ambient intelligence holds. One pundit summarizes the utopian feelings surrounding the contemporary nature of this topic; "We are standing on the brink of a new ubiquitous computing and communication era, one that will radically transform our corporate, community, and personal spheres". (The Internet of Things: ITU Report, 2005)

The formal origins of ambient intelligence can be traced back almost two decades to the findings of Mark Weiser a researcher at Xerox Palo Alto Research, who foresaw this development and described it in his influential article "The Computer for the 21st Century". In this paper and in other publications he put forward the idea of 'invisible computing'. Weiser succinctly elaborates on this seminal aspect of ubiquitous computing and ambient intelligence: "…the most profound technologies are those that

[1] http://www.itu.int/osg/spu/publications/internetofthings/ Last accessed, March 12th, 2009

disappear…they weave themselves into the fabric of everyday life until they are indistinguishable from it". (Weiser, 1999: 92)

Consequently, ubiquitous computing means 'computing everywhere'. Mark Weiser (1993: 75), who coined the term ubiquitous computing, writes:

> 'The goal is to achieve the most effective kind of technology, that which is essentially invisible to the user. [...] To bring computers to this point while retaining their power will require radically new kinds of computers of all sizes and shapes to be available to each person. I call this future world ''Ubiquitous Computing'' (UbiComp).'

Weiser describes 'Calm Technology' as the paradigm for the interaction of users with ubiquitous computing technology. Weiser and Brown (1997: 79):

> 'The most potentially interesting, challenging, pro- found change implied by ubiquitous computing era is a focus on calm. [...] Calmness is a new challenge that UC brings to computing. [...] But when computers are all around, so that we want to compute while doing something else and have more time to be more fully human, we must radically rethink goals, context and technology of computer and all the other technology crowding into our lives. Calmness is a fundamental challenge for all technological design of next fifty years.'

The origins of ubiquitous computing and the foundations of ambient intelligence can be found in the earlier incarnations of mobile phones and mobile phone networks. This has developed to a stage where we now have devices with multiple connections to communications networks; and these devices have become an integral part of the lives of millions of people. (The Internet of Things: ITU Report, 2005) This in turn leads to the contemporary situation with regards to Internet and mobile networking, which acts as a foundational platform for the development of ambient intelligence: "Connections will multiply and create an entirely new dynamic network of networks – an Internet of Things". (The Internet of Things: ITU Report, 2005)

Pundits also claim that this developing technology is neither hyperbole nor science fiction. On the contrary, they assert that ambient intelligence is solidly based technological advances that are being realized. As Bohn, et al. state:

> These smart objects may communicate by wireless means and form spontaneous networks, giving rise to a world-wide distributed system several orders of magnitude larger than today's Internet. The prospects of a world of smart things that virtually talk to each other are fascinating…' (Bohn, et al., 2005: 3)

In a very real sense, ambient intelligence also poses the question of how we as human beings will encounter and live with these objects in our environments. This means that beyond technical and software engineering aspects, also social and organisational issues demand the greatest care — as Lyytinen and Yoo (2002: 64) argue:

> 'The shift toward ubiquitous computing poses multiple novel technical, social, and organisational challenges. At the technology level, there are several unresolved technical issues concerning the design and implementation of computing architectures that enable dynamic configuration of ubiquitous services on a large scale. New challenges will also emerge in terms of how one should design and develop ubiquitous services. This may require rethinking of feasible architectures, design ontologies and domain models, requirements and interactions scenarios, and analysing new families of non-functional requirements (such as configurability and adaptability). Anticipated new ways of dynamically configuring services will also shift the line between proactive design and tailoring during use. Previously, unexplored challenges will also emerge at the border between the technical and the social: some issues are to be left outside the technical implementation to be addressed by social negotiation and due process; other issues should be addressed during technical design. Finally, the emergence of truly integrated sociotechnical systems will create a wide array of research and policy issues that deal with social organisation, impact, and the future of work, organisations, and institutions.'

The point here is that ambient intelligence is the outcome of personalized and interactive technologies that are designed to include an anticipatory function, is in essence much more than just things being 'at hand' or simply as a functional tools for use. [2] The issue is that AmI based technologies are much *more,* they are not neutral but act on the human consciousness and the perception of existential reality. As Verbeek writing on Martin Heidegger and technology states, "Technologies are not neutral instruments or intermediaries, but active mediators that help shape the relation between people and reality. This mediation has two directions: one pragmatic, concerning action, and the other hermeneutic, concerning interpretation". (Verbeek, 2005: 112) Verbeek is suggesting that the interactive and reciprocal impact of new technologies is the way they shape and mould our perceptions of who we are. They also determine how we relate to our environment and how we perceive that environment.

Therefore, as Nokia's head of design director for user interface and services, Adam Greenfield has also posited, new and radical technologies like ambient intelligence cannot be adequately understood only as neutral intermediaries.

> There must still be those, somewhere, who would insist that all technologies come into being neutral and uninflected, freely available for any use whatsoever. But ever since McLuhan, it' s been a little difficult to take such a view seriously. A more nuanced stance would be that technologies do contain inherent potentials, gradients of connection. Each seems to fit into the puzzle that is the world in certain ways and not others. (Greenfield, 2006: 61)

However, one cannot divorce technological development for a plethora of other social, cultural and political factors. It would be somewhat obvious to state that technology does not take place in a vacuum but is influenced by a host of social and psychological factors. It would be equally acceptable to state that technology is embedded in a human matrix of intentions, speculations and economic as well as social needs and requirements.

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[2] One could refer to the view on technology put forward by modern thinkers like Martin Heidegger and his view of technology as a ' standing reserve' for human use. See Heidegger' s work, The Question Concerning Technology. (http://www.wright.edu/cola/Dept/PHL/Class/P.Internet/PITexts/QCT.html)

Ambient Intelligence and the technologies associated with this phenomenon suggest a new phase of the interaction between humanity and technology - this phase is characterized by an intersection that is not a one way process or simply the human manipulation of passive technology. In this sense, technology is nascent in its interactive potential and its impact on human perception and consciousness. With ambient technology, we have a new stage of reciprocal interchange, where the technological also influences and shapes the human and society. In this sense, one could argue that the human self and existential space is also transformed by the presence and influence of technology. This issue is explored in a thesis by Asle H. Kiran (2009), who poses the following questions. "What do we mean when we say that a kind of technology (ICT or another) changes society? What does such an impact, if it is to be reckoned with, tell us about the relationship of technologies to society?" and "And what does it tell us about us – can we understand the technologically related transformation of society to say something about ourselves and about the ways we relate to our social, cultural, biological and physical surroundings?" (Kiran, 2009: 52). Kiran also states that, "Technology is ontological – it shapes our world, our lifeworld". (Kiran, 2009: 52) Ambient Intelligence Technology in fact becomes a conduit for a new understanding of human being or existence. The above inquiries have an important relevance to influence, meaning and significance of Ambient Intelligence.

The prospects and reality of ambient intelligence are also related to the postmodern perspective and the relativity of worldviews and perspectives, a point explored by Bohn, et al.

> If information is attached to 'electronically enhanced' objects, in other words physical objects effectively become media, who can or should determine their content? … Worldviews have often been the cause of disputes. Given a situation where cyberspace is approaching reality, partially overlaying or even merging into it, there are some things we must be prepared for – ultimately, some political questions of a fairly explosive nature must be asked. (Bohn, et al. 2005)

Weiser suggested, that technology might not "live on a personal device of any sort, but is in the woodwork everywhere"(Weiser 1991: 94) In agreeance Greenfield summarizes this essential moment in the history of ambient intelligence as follows:

> What Weiser was describing would be nothing less than computing without computers. In his telling, desktop machines per se would largely disappear, as the tiny, cheap microprocessors that powered them faded into the built environment. But computation would flourish, becoming intimately intertwined with the stuff of everyday life. (Greenfield 2006: 7)

Computing therefore, in Weiser's view, would become seamlessly integrated into one's persona and everyday activities, and in this sense, ubiquitous computing can be understood as not only as being 'everywhere', but also as being integrated in 'every object or thing.' "Coffee cups to raincoats to the paint on the walls, would be reconsidered as sites for sensing and processing of information, and would wind up endowed with surprising new properties". (Greenfield 2006: 7) Coupled with this is the concomitant and fundamental aspect of ubiquitous computing and ambient intelligence, namely that the individual would interact with these ubiquitous systems of computing in a way that was unobtrusive, a natural fluent, and seamless interaction between technology and human activity.

Weiser's vision of the future of ubiquitous computing was extremely bold and speculative at the time but has since been shown to be prophetic and largely accurate in its description to capture the essence and ethos of modern ambient intelligence theory and practice.

However, Weiser's vision of the future of computing was not an isolated case. There were many other thinkers who were projecting the future of computing along a similar line, like Hiroshi Ishii, who initiated a 'Things That Think' initiative[3]. This initiative to develop bridging interfaces and create "…tangible media extending computation out into

[3] http://www.media.mit.edu/research/things-think

the walls and doorways of everyday experience" (Greenfield 2006: 7), could refer to the concept of 'pervasive computing' and networking that also began to emerge at IBM in the final years of the last century. Similarly an exploration of the genesis of ambient intelligence in the subsequent escalation of mobile phones and computing are also related. The widespread adoption of mobile phones is a contemporary phenomenon that is closely linked to the growth of the concept and application of ambient intelligence. As Greenfield (2006) states, "And as mobile phones began to percolate into the world, each of them nothing but a connected computing device, it was inevitable that someone would think to use them as a platform for the delivery of services beyond conversation". (Greenfield 2006: 7) This led to the vision of mobile interconnected computing applications, developed by companies like Philips and Samsung.

This fundamental concept began to take hold within the concept of 'smart' computing and mobility and any kind of information could be linked to everyday objects. The evolution in thinking and practice from earlier concepts of pervasive and ubiquitous computing to Ambient Intelligence can be gleaned from the following extract from a study by Kostelnik et al. entitled *Applications of Semantic Technologies in AmI;*

> Ambient Intelligence (AmI) represents a vision that technology will become invisible, embedded in our natural surroundings, present whenever we need it, enabled by simple and effortless interactions, attuned to all our senses, adaptive to users and context and autonomously acting…' (Kostelnik et al. 2008: 2)

This study links the prior technological visions and innovations of Weiser and Ishii to the emergence of ambient intelligence as a functioning and realizable concept.

> In order to fulfill all these expectations, AmI must amalgamate results from several research areas, for example ubiquitous or pervasive computing (networking of numerous portable low cost devices), intelligent systems (learnable autonomous intelligence), human computer interfaces (multimodal ambient communication with

> humans), context awareness (reacting according to situational context), etc. (Kostelnik et al.2008: 2)

Thus, the interconnections between the various technologies which result in their overall integration in ambient intelligence are an important issue that will be expanded on in the sections below.

While this vision only reached a stage of conceptual implementation in the last years of the Twentieth Century, many pundits estimated that Ambient Intelligence would only be practically realized between 2010 and 2020. (Ambient Intelligence 2020. Foresight Brief No. 087) During this period there would be a range of technological products and applications that would enter into everyday use in business, offices and homes. The potential realization of this vision is evidenced by the fact that the member states united in the European Union have become eager to "become 'global players' alongside American and Japanese conglomerates" (Morley and Robins, 1995: 3)[4]. Furthermore, a wide range of parties, including Industrial players, scientists and politicians, has expressed interest in this trajectory.

The idea of Ambient Intelligence connects a number of separate ideas. Firstly, separate technological devices are integrated into large, interoperable networks "…to form digital electronic networks of intelligent devices that are integrated into their surroundings and provide information, communication services and entertainment wherever they are". (Aarts and Marzano, 2003: 12) This extends the networked notion of Ambient Intelligence technologies. Second, our separate sensory perceptions can be integrated into a more immersive experience. Within this definition of Ambient Intelligence, users should be able to access information and communication services anywhere and at all times. This entails a number of functionalities that will be explored in the following subsections, so that the scope of this development can be more analyzed.

[4] Morley David, Robins Kevin (1995) Spaces of Identity, Routledge

1.3 Five characteristics

In 2003, Philips defined five characteristics of Ambient Intelligence technologies. These are presented in the introductory pages to *The New Everyday* (Aarts and Marzano, 2003). A brief introduction to these characteristics was intended to elucidate how the technology could work, and, more specifically, how we could understand the concept of intimacy in this context. These are the visions of embededness, context-awareness, personalization, adaptation and anticipation.

1.3.1 Embeddedness

As has been referred to above, the first and most fundamental characteristic of technologies in a world of Ambient Intelligence is that they are *embedded*. Here networked devices are integrated into the environment through large-scale embedding of electronics. This also means they are unobtrusive and hidden within the context of living and working environments. In this sense they become the unseen but pervasive 'carriers' of technology. As Greenfield suggests, "[h]ousehold objects from shower stalls to coffee pots' will become the repositories of interactive technologies". (Greenfield, 2006: 1) A new sense of dimensionality or rather inter-dimensionality will enter into people's lives with the advent of Ambient Intelligence: "Information and communication technologies will be connected - from anytime, anyplace connectivity for anyone". (The Internet of Things: ITU Report, 2005)

This vision has a number of profound implications. It seems that pervasive and ambient technologies will radically alter the habitual separation between the concepts of 'here' and 'there'. This view is put forward by Shanyang Zhao et al (2009)[5] who assert that the advent of true ambient technology embedded in the environment will lead to a radical altering of the contemporary life-word or perception of reality.

[5] G. Riva, F. Davide, Shanyang Zhao. "Being there" and the Role of Presence Technology (2009)

1.3.2 Context-awareness

One of the key characteristics of devices in an Ambient Intelligence environment is that they must know the context in which they are being used. Here devices can recognize you and your situational context through user location and situation identification. Context-awareness in computing can be seen as as gathering and making sense of "information about the immediate situation—the people, roles, activities, times, places, devices, and software that define the situation" (Vian et al., 2006).

Therefore, Ambient Intelligence technologies should also be able to provide users with location-sensitive services, so that users can receive information, entertainment and communication options that are adjusted to fit the context they are in – the "right kind of information at the right time". (Aarts, Markopoulos and de Ruyter, 2007: 361) In a similar view, Dey and Abowd (2000) define context awareness as

> "...any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves"

Context aware systems aim to reduce the burden of excessive user involvement and provide proactive intelligent assistance to the users of enabled smart environments and devices. Consequently, these systems should provide a seamless interface between complex technology and their users.

1.3.3 Personalization

The third characteristic of technologies envisioned in Ambient Intelligence is that they should be *personalized*, which requires the ability to recognize a user's preferences and to act upon them. Devices should be tailored to your needs through interface and service adjustment. This ability to emanate a digital aura that invites and enhances the

opportunity for new experiences is a key characteristic of the Ambient Intelligence Vision.

I think that two different meanings are connoted here. The first refers to the way that technology "… will adjust its behavior to the personal preferences and needs of individual users". (Aarts, Markopoulos and de Ruyter, 2007: 362) Because users have different demands about the amount of information they want to receive through technological channels, "Personalization is an essential aspect of ambient intelligence; in this case it covers not the superficial aspects of the system behaviour but addressing the specific needs, problem and situation". (Aarts, Markopoulos and de Ruyter, 2007: 362) The second refers to rich models of user preferences that go beyond basic habits and preferences. This in turn brings into focus variables such as health status, social networking factors, and the general social context as well. From this different perspective, personalization refers to the way spaces, environments and objects are personalized by the ambient technology.

1.3.4 Adaptation

If Ambient Intelligence systems are to provide 'personalized' services, this obviously leads to the assumption that ambient technologies should have adaptive qualities and they should be able to change in response to the user based on learning processes.

This point raises a host of technological as well as social and philosophical questions. New conceptual technologies, such as Augmented Cognition might help. Augmented Cognition refers to recent research where "…the basic premise is to address cognitive bottlenecks (e.g. limitations in attention, memory, learning, comprehension, and decision making) via technologies that assess the user's cognitive status in real time". (Hildebrandt, M., & Gutwirth S., 2008: 76)

As Hildebrandt and Gutwirth report, this technology implies a process of monitoring the state of the user, making use of behavioral, psycho-physiological and possibly neuro-physiological data that can be acquired from the user in real time. This data is then adapted or augmented by the technology or the computational interface to provide the needed response or to accomplish the required task. (Hildebrandt, M., & Gutwirth, S. (2008), Profiling the European citizen)

1.3.5 Anticipation

Devices in Ambient Intelligence systems should be able to anticipate the users desires without conscious mediation through reasoning - without the users needed to express intent. This vision of Ambient Intelligence is by far the most debatable in terms of its psychological and socio-cultural implications.

Brey sketched the proposed scenario in which this type of anticipatory reflex is inscribed in hidden technology. In such a landscape, "…computers should not wait for human inputs in order to take an action or communicate with another device, but proactively anticipate the user's needs and take action on his or her behalf". (Brey, 2006: 3) If one follows the concept of the anticipatory mode of Ambient Intelligence to its logical outcome, a number of intriguing but potentially problematic aspects are revealed. As Brey (2006) states, that in a situation where anticipatory technology functions it would be desirable that humans give up on direct control in such a setting. Tennenhouse (2000) argues, "that because if humans were to stand in between a computer and its environment, they would only function as glorified input/output devices that perform tasks that the computer can perform for us".

Taken together, the technological developments based on these five characteristics described above will create a profoundly different information landscape from the one with which we are familiar today and that we will have to cope with the following

technological key characteristics:[6]

• Complexity – as hardware capabilities improve and costs reduce, there is continuing pressure to attempt to build systems of ever greater scope and functional sophistication;

• Boundary-less nature of the systems and interconnectedness – few systems have a clear-cut boundary. They are subdivided into systems within systems;

• Unpredictability – all nodes, connected through a common infrastructure are potentially accessible from anywhere at any time, which may result in unpredictable emergent behaviours;

• Heterogeneity and blurring of the human/device boundary as, for example, wearable and/or implantable devices become more widely available and drop in cost;

• Incremental development and deployment – systems are never finished, new features (and sources of system faults and vulnerabilities) are added at a continuous pace;

• Self-configuration and adaptation – systems are expected to be able to respond to the changing circumstances of the ambient where they are embedded.

1.3.6 Another factor: Persuasion

Persuasive technology is broadly defined as a technology that is designed to influence attitudes or behaviors of the user through persuasion and social influence, but not through coercion. As Aarts, Markopoulos and de Ruyter in '*The Persuasiveness of Ambient Intelligence'* (2009: 360) state: 'Persuasion is an attempt to change attitudes and/or the behavior of persons without using force or deception'.

[6] Riguidel, M., and F. Martinelli, "Beyond the Horizon - Thematic Group 3: Security, Dependability and Trust", Report for Public Consultation, 2006. http://www.beyond-the-horizon.net.

Persuasive technologies are regularly used in sales, diplomacy, politics, religion, military training, public health, and management, and may potentially be used in any area of human-human or human-computer interaction. Most self-identified persuasive technology research focuses on interactive, computational technologies, including desktop computers, Internet services, video games, and mobile devices. (Oinas-Kukkonen et al. 2008) However, this incorporates and builds on the results, theories, and methods of experimental psychology, rhetoric (Bogost 2007), as well as human-computer interaction. The design of persuasive technologies can be seen as a particular case of design with intent. (Lockton et al. 2010)

There are various applications and incarnations of persuasive technology that include for example, portable hand-held devices, web-based applications, standalone programs, robots, and computerized toys. (Khaled, 2008: 2) There is a set of criteria that need to be met in order or be identified as persuasive technology. These are (a) that the persuasion needs to be a result of the interaction between human beings and computer technology; (b) the possible persuasion should be intentional and planned and not by-products of the interaction. The final one is in Khaled terms that '… the persuasive intent must be endogenous, or 'built-in' to the product, such that the persuasive or motivational appeals come from the product itself, as opposed to exogenous, whereby persuasive appeals come from an outside source'. (Khaled, 2008: 2)

The emergence of such technologies, as developed for example in the field of Ambient Intelligence are specifically designed with the explicit aim of persuading people to take certain decisions in particular ways, has even given rise to a new discipline academically that studies persuasiveness in human-computer-interaction, called *captology*, a term coined by B. J. Fogg.[7] Nevertheless, the idea of persuasion has deep historical roots. Persuasion has been a subject of human investigation for millennia.

[7] http://captology.stanford.edu/

The ancient Greek deemed the topic of "moving or inducing someone by words to do something" sufficiently important to give Peitho — the goddess of persuasion—a place next to the better known Eros and Aphrodite. As Gram-Hansen states (2011):

> The notion of persuasion may be linked to the ancient Greek art of rhetoric. Aristotle is credited as being founder of the basic system of rhetoric, and his work forms the basis of modern day's scientific approach to strategic communication…. Modern rhetoric however focuses on types of communication beyond actual speech. Literature, architecture and even street signs illustrate analogue ways of strategically communicating a message to the receiver. (Gram-Hansen, 2011: 2)

This brief summary neatly captures the way in which the traditional idea of *persuading* through speeches and rhetoric in the squares of Ancient Greece has been today replaced with a broader and more ubiquitous idea of 'strategically communicating a message' to the receiver. Scholars of psychology and communication define persuasion as "...a symbolic process in which communicators try to convince other people to change their attitudes or behaviors regarding an issue through the transmission of a message in an atmosphere of free choice." (Perloff, 2003) In this view, persuasion concerns a persuader who, by the act of communication, changes the attitudes or behavior of a target. Given this definition classical conditioning, operant conditioning, the formation of attitudes, and the more contemporary work on perceived and preferred attitude basis all concern persuasion (Kaptein et al., 2009). We have moved from the formal rules and principles of moral and political debate in public, to the specifically *modern* idea of taking a 'scientific approach' to communication. We have also shifted from speechifying to simply 'communicating'. This further implies that one can 'strategically communicate' in both private and public. Further, it implies that potentially anybody can do the persuading, and using potentially any kind of thing - for example, architecture and even street signs are categorised as being *persuasive* when the term is understood as a strategic communication. In this sense, it would seem that most aspects of our lived environments are *persuasive*. Fogg (1999) points out that scholars can agree on no proper definition of *persuasion,* and so loosely defines the term: " persuasion is a noncoercive attempt to change attitudes or behaviours" (Fogg, 1999:134). The definition is a nod to Foucault's

suggestion of a sharp distinction between violence and persuasive uses of *power*: the second is characterized by being exercised over *free* subjects who choose to disengage, give a different response and so on. Further for Fogg (1999), persuasion necessitates attempting to change a person, which implies that an *intentionality* is at play; and finally, it involves changing either attitudes and/or behaviours.

For Fogg (1999), captology matters particularly when it comes to commerce. However, Fogg (1999) also suggests that in a general sense, that persuasion is an everyday part of human life, that as adults, we are used to dealing with in all aspects of our existence. Further, Fogg (1999) distinguishes between two levels of persuasion that persuasive technologies can work at: macrosuasion and microsuasion. The first concerns technologies designed with an overall persuasive purpose, in the way that www.amazon.com is designed so that people buy products. The second concerns things like spreadsheets, whose overall goal is not persuasion, but which might incorporate a persuasive element into the product.

However, Gram-Hansen (2011) takes issue in particular with Fogg's (1999) contention that technologies have intentions, and also with how these are related to the intentions of designers:

> The designer will most often have a specific intention with the design of a technology, but this intention is often more complex than "wanting to motivate people to quit smoking", and the user's intention towards applying a specific technology, must to some extent be motivated by exogenous factors. (Gram-Hansen, 2011: 135)

In this way, I bring out the way in which when a technology is designed, even when it is supposed to explicitly persuade a person to do something ('stop smoking'), then it is not the case that one can talk about the intentions of specific people (other than the end-user) in obvious ways. For example, it is not just one designer who will work on the product, but even in this case, the designer works to a brief, the brief is the product of some other process, and so on. A further key point in the above passage is the acknowledgement that the users themselves must make a decision to use some particular technology. In many cases, this may be with the specific intention of achieving a particular goal ('stopping

smoking'), and this intention may well have been a product of a wider set of concerns, too. Hence, Gram-Hansen (2011) highlights the way in which new products are designed as the results of long and often complex decision-making processes, often involving a wide range of actors. This complicates the question of 'who' as an individual is responsible for particular technologies.

For Fogg (1999), it is also the case, not just that persuasive technologies *are* persuasive in something like the way that people can be, but further that they are *better* at being persuasive in a number of ways. For example, computers are persistent in a way people rarely are. First, they make things *easier* for people to do, and in that sense, play a part in persuading people to do those things (Fogg, 1999). This is to say that computers can increase self-efficacy (Lieberman, 1992), which means that they affect individuals' beliefs in their ability to take successful action in specific domains (Bandura, 1997; Bandura, Georgas, & Manthouli, 1996). Second, computers are good at providing tailored information, which, when compared with non-tailored information, leads to an increase in people's potential for changing their behaviour and attitudes (Dijkstra, Librand, & Timminga, 1998; Jimison, Street, and Gold, 1997).

Third, computers can persuade people to do something by cuing a decision-making process. Fogg (1999) uses the example of a web browser automatically opening another window to let people know they are about to send data over an insecure connection. Fourth, is the idea of computers simply as *persuasive media:*

> In this role computer technology provides people with experiences, either first-hand or vicarious. By providing simulated experiences, computers can change people's attitudes and behaviors. Outside the world of computing, experiences have a powerful impact on people's attitudes, behaviors, and thoughts (Reed, 1996). (Fogg, 1999:138)

This is significant, as providing people with simulated experiences is something that computers can do in a powerful way. This could involve a digital game, or being 'inside' a simulation-using cave technology. The rationale is that, it are *experiences* of particular

things or events or people that have a significant impact on people's behaviour and thoughts.

Finally, Fogg (1999) holds that computers can be persuasive as social actors. This reflects the way in which people can be said to enter into 'social relationships' with computers, for example, their Personal Computers (PCs) or robots. There are then three ways that computers *qua* social actors can be persuasive: (1) by providing social support, (2) by modeling particular attitudes and behaviors, and (3) by leveraging social rules and dynamics. It must be noted here that limited empirical studies have been completed in these areas; therefore, the research surrounding it should be understood as tentative at best.

As Aarts, Markopoulos and de Ruyter showed in their study, *The Persuasiveness of Ambient Intelligence,* the link between persuasion and motivation leads to models and theories of persuasion that have relevance to the issue of Ambient Intelligence. This in turn refers to different theoretical approaches to human motivation and persuasion, including the behavioral, cognitive, and expectancy theories of human behavior.

Following on from this theory, and in agreeance with the authors, technology can be persuasive within the ambit of the theory of Ambient Persuasion, due to the following actions.

- Making things easier, reducing complexity
- Guiding users through a step-by-step process
- Personalizing to the user and context
- Suggesting things to the user at the right time
- Monitoring the user so that the user can learn from himself
- Monitoring others so that the user can learn from others
- Conditioning the user

(Aarts, Markopoulos and de Ruyter, 2007: 361)

Ambient persuasion can therefore, be seen to extend the use of context aware and networked computer applications because they are designed to "…enable context-sensitive system behavior and deliver persuasive content that is tailored to the user at the right time and at the right place". (Aarts, Markopoulos and de Ruyter, 2007: 363)

The issue of persuasion inside Ambient Intelligence raises some obvious ethical issues that have been extensively debated. This debate is obviated to a certain extent by the focus on practical possibilities '…ensuring that the technologies which are created are as ethical as possible'. (Gram-Hansen, 2009: 9) Developers are also concerned that the users of this technology are even '…aware of the persuasive intentions embedded within the design of the device'. (Gram-Hansen, 2009: 9) This is an aspect that will require more analysis and discussion, especially with regards to the contentious issue of privacy.

1.4 Ramifications, possibilities and concerns about Ambient Intelligence

A number of issues surrounding AmI discussed in the literature are relevant to the concerns of this thesis and will be briefly introduced in the following sections.

1.4.1 Profiling and privacy

The concept of *profiling* is central to the use of AmI in everyday situations. Profiling technologies are the crucial link between an *overdose of trivial data* about people's movements, temperature, and interaction with other people or things and *applicable knowledge* about our habits, preferences and the state of the environment. These intersections and the matrix of connections that constitute Ambient Intelligence are clearly outlined by Mireille Hildebrandt (2007).

> Both industry and the European Commission are investing huge sums of money into what they call Ambient Intelligence and the creation of an Internet of Things. Such intelligent networked environments will entirely depend on real time monitoring and real time profiling, resulting in real time adaptation of the environment. (Hildebrandt, 2007:7)

Hildebrandt (2007: 7) points to the fact that "profiling thus creates the added value in the mass of data, amongst which we do not yet know what is noise and what is information". As stated before, the vision of AmI depends on a seamless adjustment of the environment to our inferred habits and preferences. This presumes what Tennenhouse (2000) describes as *proactive computing*, diminishing as far as possible any human intervention.

> The idea is that users need *not* provide deliberate input as in the case of interactive computing, but are 'read' by the environment that monitors their behaviour. To adapt seamlessly the environment, users cannot wait for a human interpreter but need profiling machines that draw their own conclusions about what users prefer when, and where, hoping to thus solve the problem of endless choice and deliberation. (Hildebrandt (2007: 7 - 8)

Hildebrandt further makes the important point that "only after using data mining techniques on the interconnected databases can the things in our environment become smart things and start acting like agents in a multiagent network (MAS)". (Hildebrandt, 2007: 7)

This fact that AmI functions by building 'user profiles' 'recording users' preferences and other relevant information concerning their behavior raises a number of questions concerning privacy in general, and to what extent users could – and should – be aware of such profiling practices in particular. The potential for *invisible* AmI raises similar questions concerning control and invasiveness. Some argue that in order for such technologies to be accepted as playing a role in everyday life, that users must be aware of their monitoring and profiling potential (Abowd and Mynatt, 2000: 51).

However, AmI is supposed to work in discrete ways as part of its designed function. This suggests that the visibility of the technology and the invisibility of its method of working must be carefully balanced in both design and use.

The notion of privacy, especially concerning personal information, is often debated in relation to both AmI and its potential use as a surveillance tool. Moreover, many Governments and other public bodies in general, and the European Trade Commission in particular are aware of the need to safeguard privacy and security; this is one reason why AmI is not being materialized in the way that it has the potential (and resource) to be in the contemporary world[8].

These concerns are also closely linked to the notion of embedding discussed in the sections above. The questions that are raised revolve around issues such as, who will be able to control and determine what information is being used to create the necessary profiles and, more importantly, who will have access to this information? This suggests that the "brave new world" of Ambient Intelligence may in fact hide certain serious and problematic issues.

Brey (2005) states, that in connection to Ambient Intelligence, the ethical issue of privacy has received the most attention. Bohn et al. write, "Intelligent fridges, pay-per-use scenarios, and dynamic insurance rates paint a future in which all of our moves, actions, and decisions are recorded by tireless electronic devices, from the kitchen and living room of our homes to our weekend trips in our cars." (2005, p. 9) In a related perspective Langheinrich imagines: "With a densely populated world of smart and intelligent but invisible communication and computation devices, no single part of our lives will per default be able to seclude itself from digitization. Everything we say, do, or even feel, could be digitized, stored, and retrieved anytime later." (2001: 280).

[8] These ethical considerations are discussed for example by IPTS and ISTAG who are advisory members to the European Commissions in articles such as, *The virtual residence: Identity, privacy and security* (Beslay and Punie, 2002); *Digital Territories: Towards the protection of public and private space in a digital and Ambient Intelligence environment* (Daskala and Maghiros, 2007); and projects such as *Safeguards in a world of Ambient Intelligence (SWAMI)*. (cf. Alahuhta, et al., 2006; Wright, et al., 2006).

Bohn et al. (2005: 9) emphasized that “many AmI devices will have searching capabilities to comb databases for specific pieces of data, notably data of past events”. Based on such features, Ambient Intelligence is a technology that harbors great risks for privacy, moreover because of the “often highly sensitive types of personal information that are recorded and encoded, the scale on which this information is recorded, and the ease with which it could potentially be disseminated and made available to other parties” (Brey: 99). For example, it can be seen that “by virtue of its definitions, the vision of ambient intelligence has the potential to create an invisible and comprehensive surveillance network, covering an unprecedented share of our public and private life…” (Bohn, et al., 2005: 9-10).

In a similar way Araya claimed: "Ubiquitous Computing aims not only at satisfying the need for instantaneous access to information, but it also attempts to give instantaneous access to any “thing” including tools, books, and people, transforming them into *surveillable things*" (Araya, 1995: 233). “Objects will not just be objects anymore”, Araya has argued, “but will be information structured that can be monitored, and the same will apply to people. AmI thus has the potential to introduce widespread and pervasive surveillance into society, on a much greater scale than seen before, and may in the process fundamentally alter our relationship with the world” (Araya, 1995: 233).

One can summarize these ethical concerns as follows: “one of the fundamental ethical questions regarding Ambient Intelligence is whether it is more likely to enhance human autonomy and freedom, or diminish it” (Brey, 2006: 9). This raises the tension between control and influence that can be seen to arise when considering the possible uses of AmI:

> … smart objects may perform actions that do not correspond to the needs or intentions of its user. This may happen because the object makes incorrect inferences about the user, the user’ s actions, or the situation. Second, even if a smart object ultimately does what one wants, it may still be experienced as taking away control by telling us

> how to act, by assigning particular meanings to human behaviors that may be unintended, and by requiring negotiations and corrective actions in order to avoid the object' s preferred course of action and implement one's own. (Brey, 2006:10)

The issue concerning the proper balance between control and influence is related to concerns surrounding privacy and visibility, especially concerning the integral profiling capabilities of AmI. For example, whilst it might seem possible that users gain access to their profiles and have the ability to delete personal data, this would also seem in contradiction to the idea that AmI work unobtrusively in the background and free up people's time. Moreover, there are no 'off' buttons in the world of AmI, meaning that users would need to make a clear decision to enter an AmI environment, yet might be unaware of a "system's extent, domain of operation, or ownership" (Greenfield, 2006:66). In turn, this would suggest that users are not aware of the consequences of entering an AmI environment:

> I had no idea that this store tracked my movements through it and would mail me coupons for products I stood next to for more than ten seconds but didn't purchase. I didn't know that this toilet would test my urine for the breakdown products of opiates and communicate its findings to my doctor, my insurers, or law-enforcement personnel. (Greenfield, 2006:66)

It is also possible to imagine certain consequences of living in an AmI world, where one might have "have been compelled by simple expedience, by social convention, by exhaustion, by force of regulation or law to accept such an exposure" (Greenfield, 2006: 66). Examples of this can be seen in contemporary society, for instance people who use public transport yet who are uneasy about their location being logged when they use RFID tagged transportation cards, or by applications for their iPhone.

If this and similar practices and uses of AmI are extended across society, it would seem that it would no longer be possible to appreciate the possible consequences of actions, since AmI:

> is not something you can sit down in front of, intent on engaging. It' s neither something that is easily contained in a session of use, nor an environment in which blunders and missteps can be Ctrl-Z' ed away. (Greenfield, 2006:39)

This raises the important question of the identity of the user in AmI environments. Because of the peculiarly *interactional* quality of engaging with AmI technologies, it is possible to consider that the *meaning* of what it means to use technology shifts when considering the context of AmI. An example:

> The PC user actively chose the time, manner, and duration of her involvement with her machine, and also (assuming that the machine was portable). had some say in regarding where it took place…the interaction fell into a call-and-response rhythm: users actions followed by system events…Compare these facets…to [a world of Ambient Intelligence], in which the system precedes the user. You walk into a room, and something happens in response: The lights come on, your e-mails are routed to a local wall screen, a menu of options corresponding to your new location appears on the display sewn into your left sleeve. (Greenfield, 2006:38)

Greenfield (2006) captures the way in which the relationship between the user and the technology seems to some extent inverted with the use of AmI. This is related to issues of how much control the user has over the technology, and to what extent the user is aware of what the technology is doing or how it functions. However, it would seem that there are equally a range of new possibilities that open up when considering the potential uses of AmI in practices, specifically if it were possible to easily switch of AmI, or to opt for an alternative technology. However, this does point to the need to consider in more detail the complex kinds of relationships that could emerge between people and AmI technologies, and to some extent are already being seen in the contemporary world.

1.4 Conclusion

This chapter has introduced the idea of Ambient Intelligence. Central to the notion of AmI is the idea that it has the potential to be ubiquitous in everyday life, to function unobtrusively and to anticipate the users' unique and personal needs, to act semi-independently, invisibly and with the explicit aim of providing personalized services. Finally, the chapter has briefly sketched a number of salient and significant issues regarding privacy, profiling and control.

However, the main focus of this thesis concerns the possible effect that AmI could have on the construction and expression of the self, specifically concerning the concept of *identity*. In their book *The Meaning of Things: Domestic Symbols and the Self*, [9] Mihaly Csikszentmihalyi and Eugene Rochberg-Halton posit that there is a mutual shaping process taking place between material environments and identities. Their arguments imply that men and women make 'retrieve their identity' through their relations with the material world, and that these interactions strongly determine the kind of identites that emerge.

As Tirrell (2010) puts it, this imbrication of the self in a network of constructed objects that Csikszentmihalyi and Rochberg-Halton identify underlies the actual and virtual structures of information-intensive environments presented in the vision of the AmI. Here human action is coordinated with complex virtual/actual environments characterized by flows and relations between many different agents. Consequently, Julian Bleecker describes the vision of AmI as more than a world of RFID tags and networked sensors:

[9] Csikszentmihalyi, Mihaly and Rochberg-Halton, Eugene, (1981) The meaning of things: Domestic symbols and the Self, Cambridge University Press

> Once "Things" are connected to the Internet, they can only but become enrolled as active, worldly participants by knitting together, facilitating and contributing to networks of social exchange and discourse, and rearranging the rules of occupancy and patterns of mobility within the physical world. "Things" *in* the *pervasive* Internet, will become first-class citizens with which we will interact and communicate. Things will have to be taken into account as they assume the role of socially relevant actors and strong-willed agents that create social capital and reconfigure the ways in which we live within and move about physical space. (Bleecker, 2004: 2)

As William Mitchell comments, these technologies 'change the fundamental mechanisms of reference – the ways in which we establish meaning, construct knowledge, and make sense of our surroundings by associating items of information with one another and with physical objects' (Mitchell, 2003: 120). In a similar point of view, states Hannah Arendt in her book *The Human Condition*, "Against the subjectivity of men, stands the objectivity of the man-made world rather than the sublime indifference of an untouched nature" (137).

The remainder of this thesis takes the concern with the relationship between identity and AmI as a critical point of departure. It focuses specifically on everyday social contexts, and seeks to examine how *human beings encounter and interact with Ambient Intelligence technologies*. One of its central assumptions is that technology plays a role for human beings in particular, concrete practices of use. In turn, this means what technology people use and how they use it has an influence on how they perceive and express themselves. As Latour (2005) notes:

> To be accounted for, objects have to enter into accounts. If no trace is produced, they offer no information to the observer and will have no visible effect on other agents. They remain silent and are no longer actors: they remain, literally, unaccountable. (Latour, 2005:79)

This constitutes a useful starting point to examine the *relationship* between AmI and identity. This thesis argues that this relationship can be best understood by examining how people and technologies 'meet', in order to illuminate how these interactions between human beings and artifacts affect identity.

The concept of *technological mediation* is a concept introduced, defended and developed as one which is both useful and sensitive in drawing out the peculiarities and nuances of human-technology relationships (cf. Verbeek 2005). The next chapter therefore turns to a more thorough presentation and development of this concept, offering a philosophical analysis of the way in which relationships between human beings and the shared social world are structured from a phenomenological perspective.

Chapter 2: Technological Mediation

> Phenomenology, however, does not need to take shape as a philosophy of alienation. lt originally took this direction in part in reaction to the positivistic world-view, but the ideas that lie at its foundation can be worked out in an entirely different manner. (Verbeek, 2005:108)

2.1 Introduction

This is a theoretical chapter that considers the relevant literature concerning the concept of technological mediation, exploring how this mediation is traditionally conceptualised and considering how this conceptualisation might be challenged when applied to intelligent technologies. In relation to the overall trajectory of the argument in the thesis, the chapter explores in critical detail the first central claim, that smart technologies blur the traditional boundaries between people and things (C1). In terms of specific objectives of the purpose of the thesis, this chapter aims to fulfil (TO1): To understand the emerging field and use of 'persuasive technology' within a meaningful theoretical framework - drawing in particular on a phenomenological perspective - that sees technology as a *mediation* of *human subjectivity* and society. The aim is to understand: (a) the precise meaning of 'technological mediation' and whether it is possible to distinguish different types of mediation; (b) the differences and similarities between human and technological agency and intentionality. This chapter also offers a more detailed justification of the specific methodological and theoretical approaches taken by the thesis as a whole.

It presents a sketch of the development of the philosophy of technology from a broadly European and American phenomenological perspective over the best part of the last century. It traces from of the influential fathers of the philosophy of technology, the German thinker Martin Heidegger, who developed the work of his teacher, Husserl, one of the pioneers of phenomenology.

I explore in particular Heidegger's concept of *technological mediation*, and critically examine how this gives an articulation to the shape of *Dasein* or people's being-in-the-world. Here, the world is *revealed by* technology. I go on to consider how Heidegger perceives that pre-modern and modern technologies function in profoundly different ways, causing a *concealing* of the world, or what has elsewhere been termed as a form of alienation. I consider how this can lead to negative conclusions about the Heideggerian position on technology.

Bodily extension is an influential and intuitively appealing post-Heideggerian perspective that articulates a 'proper way' to conceptualize the relationship between people and technology. I argue that, although this theory has some explanatory power and basis in describing some historical earlier tool-use, it fails to capture the multifarious roles that technology now plays in everyday life. In particular, several important aspects of the contemporary experience of technology have been emitted.

When one compares Heidegger on the philosophy of technology with the North American philosopher of technology and science, Don Ihde, and the Dutch philosopher Peter Paul Verbeek, Ihde and Verbeek can be characterized in general as being 'post-phenomenological' in approach. They prefer to posit that there has been an 'empirical turn' within the philosophy of technology. Ihde rejects Heidegger's abstract search for the essence of technology in favour of concentrating on the role of individuals in everyday life, and the different ways in which they structure human relations. By offering a brief exposition of Ihde's typography of human-world relations, I explore in more detail the different types of ways in which technology can be said to *mediate* human experience in contemporary life. How Verbeek built on Ihde's work by developing in more detail the concept of *intentionality* with regards to technology? How did this bring out a more 'radical' post-phenomenological project of reconceptualizing the relationship between subject and object? How does the technology that permeates our everyday life restructure human experience and the human subject? Through these questions, I examine the concept of *intentionality* to technology, arguing that more clarification is necessary in this regard.

Affordance is a contemporary theorisation of the inherently relational way, in which people and technology are related. This concept was first articulated by the psychologist of ecology, Gibson (1979), and presents a truth-theoretic interpretation that understands the affordance of an object as a special kind of relational property. Whilst this interpretation posits how to relativise affordances to specific contexts, times and perceivers, I present a more fine-grained notion that differentiates the way in which technologies in particular can be said to have affordances. As articulated by Ihde and touched upon by both Kiran (2009) and Verbeek (2005), *multistability* is affected by this differentiation. Here, I point out that *meanings* or *conventional uses* of technologies are always established through a social process, and explain how this can diverge from the intended, or designed, use of technologies. The aim is to create a fuller appreciation about the way technologies can be said to mediate people's experiences and their being-in-the-world in the twenty-first century.

2.2 Heidegger on technological mediation

There are two different but closely related approaches to the philosophy of technology. These approaches diverge on the central question of the mediating role of technologies in human beings' relationship with the world. The first is the 'classic' or 'phenomenologist' approach of Martin Heidegger (1889-1986) and Karl Jaspers (1883-1969), articulated most forcefully in the early to mid twentieth century. These defined the *essence* of technology, and described how technology allowed us to be-in-the-world. Compared with today's 'empirical' or what has been termed 'postphenomenologist' orientation by Verbeek (2005), Albrechtslund (2009), and Kiran (2009). Heidegger's understanding of the *mediating* role of technology in people's interpretation of, and way of being in, the world is considered the 'classic', because of his existential concern about how people experience that shared social world. This is the point of departure for the later 'empirical' turn in the philosophy of technology in a number of important respects (Albrechtslund, 2009). In order to understand the relevant aspects of Heidegger, his context is also important to understand.

Heidegger was an influential German phenomenologist writing just after the beginning of the mid-twentieth century and up to the 1970s. A student of the earlier phenomenologist Husserl, Heidegger's thoughts on a variety of phenomenologist, existential and 'hermeneutic' themes developed through the consolidation of the modern period in Europe, and through two World Wars. Heidegger developed his own philosophical system for understanding a range of old and new phenomena, and introduced a variety of new terminology into the literature. Although this is often confused and confusing – outside of the constraints of his own philosophical system, many Heideggerian terms persist in the literature surrounding the philosophy of technology. Perhaps a brief outline of certain aspects of his philosophical system may help to understand their original meanings, and their references to the subject of technological mediation.

2.2.1 Dasein, tools and the lifeworld

One of Heidegger's central concerns as a philosopher was the nature of being, but *Dasein*. This is coupled with a contention that it is important to overcome the 'strict subject-object dichotomy' that he saw as a problem of Western philosophical thinking since Plato. This concern often occupies contemporary theorists engaging with his work, but Heidegger's general investigation is underpinned by the assumption of the fundamental interrelatedness of people and their shared social world. This *lifeworld* as Heidegger (1962) called it, premises the importance of inter-subjectivity, and stresses the social constructedness of the social world. But in Heideggerian philosophy, *lifeworld* has a specific meaning, and this thesis shows how this concept has been expanded and debated by others.

Following Heidegger and according to Kiran (2009), the relationship between a person and the lifeworld, "can be described most effectively as *throwness*" (Kiran, 2009:24). He describes the way in which human beings, as social beings, are *thrown* into the world that has already been structured in a particular way, replete with ready-made meaning (Kiran, 2009). It also highlights the way in which subjects do not exist as a reflective Cartesian

ego ('I think…therefore I am') independently of an existence in – or engagement with – a shared social world of objects and other beings around there. Rather, subjectivities are created *through* their engagement with the shared world of objects and other beings, causing a shift in how that world is revealed to them. Subjectivity is in this sense *embedded* in the world, and not a *pre-given* as seems assumed by the Enlightenment philosophers preceding Heidegger, like Kant. Heidegger is concerned with the role of technology in both revealing and concealing that world and in how this transforms the being – *Dasein* – of man in the process. As stated earlier, *Dasein* is distinct from other types of being, because of its existential aspect in the relation to technology. We, as *Dasein*, can only discover ourselves through the world, and our relations with other beings. (Kiran, 2001)

For Heidegger, this *Dasein* is in a constant state of transformation, or *becoming*. Furthermore: this *being* of beings may transcend humans. As Achterhuis suggests, "it is not their product, but the omniscient horizon of their relation to beings" (Achterhuis, 2001:121). This highlights how the subject (being) is understood primarily in relational terms and it expresses the basic idea that how one is-in-the-world is not directly a *product* of an isolated self from the world, since the real 'me' is already somebody existing within a shared world. This general view of the *co-constitution* of the subject specifically regarding Foucault and Ricoeur will be further extended in chapter 5. What is premised by Heidegger's understanding is that the sheer range of possibilities for different types of being or becoming, are due to their relations with other beings. As Kiran posits, a principle concern of Heidegger's philosophy of technology is to "work out a philosophy of the lifeworld that recognizes the constitutive role of the technology" (Kiran, 2009:25). Via the constitutive role technology plays in man's being-in-the-world.

I think that sufficient and suitable philosophical articulation about the constitutive role of technology in everyday life has not been adequately explored, but the main point to draw from Heidegger's classic phenomenologist approach is that *all* human experience, interpretations of and relationships with the world are mediated by necessity. Furthermore, the human subject – or being-in-the-world – is also mediated by *its very*

being. Technology is only one means of mediation after all, but by no means the only one.

Heidegger sought to define the *essence* of technology in general, and wanted to clarify its role in culture and society (Achterhuis, 2001). Thus, his efforts were in many ways a definitional, rather than an explanatory philosophical project. Writing in 1927 in the middle of the two World Wars, technology was given a broad definition, which encompassed things like simple tools. Tools were understood primarily as *linkages* or *connections* between human beings and reality (Heidegger, 1927). Rather than reflecting on tools as objects existing 'externally' of us, Heidegger premised how tools present themselves to us as already connected to a whole range of other objects. These sets of tools could be called the *equipmental totality* (Kiran, 2009), because they are *ready-to-hand* to people to use in the everyday world and in relation to other tools. For Heidegger, this readiness-to-hand of an object "precedes all our contemplations on what kind of entity it is" (Kiran, 2009:111). This reflects the practical dimension with which tools strike us in our everyday lives, but it also shows the directness or immediacy with which people tend to use objects, without particular conscious deliberation. For example, when the hammer is used to hammer a nail into the wall, the hammer tends to *withdraw* from human's attention (Kiran, 2009). Thus if, "the hammer takes on a signification on a par with my arm; it becomes as transparent as my arm itself" (Achterhuis, 2001:115). Perhaps there is "no phenomenological difference for the user between how his or her arm attaches to his or her body and how the hammer attaches to his or her arm" (Achterhuis, 2001:115).

However, when the tool ceases to function correctly, for example, when the handle breaks off the hammer's head, then the tool becomes *present-at-hand*, or directly present's itself of the person's attention and to appear as a thing-in-itself (Achterhuis, 2001). Importantly, it is only by comparing the broken hammer to an *equipmental totality* that it makes sense to talk about the hammer as being broken; to say that it no longer has a particular function is "to presuppose that it had a function, an usability in the first place" (Achterhuis, 2001:116). As Kiran (2009), noted that one must first have a

conversance with particular contexts in order to recognise a tool *qua* tool in the first place, yet in both cases, ready-at-hand and present-at-hand, the tool can be said to mediate, or co-constitute, the relationship between people and the lifeworld.

2.2.2 Ambivalence, modernity and the concealing of reality

Heidegger constructed two mutually complementary definitions of technology, which were then used to clarify its mediating role in human experience of the society at a broader level. These definitions locate the essence of technology in something which is not itself technological, since what is important for Heidegger is the "being which makes technology possible" (Albrechtslund, 2009:3), rather than what might be taken as technology *per se*. From here, there is first an instrumental-anthropological definition, which sees technology as a means to fulfill an objective and a human activity; and second, building on this definition, is the idea that technology causes things to be brought about, and in this sense, it is a *bringing forth* or a *revealing* of the world (Albrechtslund, 2009). There is then a further two-fold application of this expanded definition when considering traditional and modern technology. For Heidegger, traditional technology is revealing in the form of bringing forth; however modern technology is revealing in the form of challenging, rather than bringing forth, because it can control. "The world is challenged and yields for modern technology" (Albrechtslund 2009:3).

These are two very different ways in which technology reveals the world. The latter can be understood as technology not being presented to human beings as an object in its own right that I discover; but rather, as being 'reduced' to a means for human ends. Human's way of being in this new, modern world is ripe for human exploitation and manipulation, is fundamentally changed. There is no *Dasein* outside of being-in-the-world, and as these terms are co-extensive; hence, if the way our relationship with reality is mediated is changed in some significantly way, then so is the nature of our *Dasein*. For Heidegger, the user enters a new 'age of being' called *Gestell* – or *enframing* – and this is the being that is essence of modern technology (Albrechtslund, 2009). Today technology mediates

or *reveals* the world in different ways for the user's *Dasein*. Therefore how I am-in-the-world changes when this world is revealed by traditional or modern technology.

As suggested earlier in this chapter technology affects the way the world is revealed to the user in a number of new and exciting ways, and opens up new possibilities for being-in-the-world. Thus, specifically modern technology also *reduces* the world for *Dasein,* causing a great danger. For Achterhuis (2001), the worry is that people could forget other ways of being-in-the-world, or other ways of revealing the world, when using modern technology, and this is because being is always revealed for us through other beings. As he suggests:

> " humans are not independent or neutral subjects, but necessarily connected to a certain understanding of being or ' horizon' which shapes the world. In our time, the age of modern technology, the world appears in the shape of a standing reserve, i.e. as a stockpile for human calculation, demand and control, and the name of this epoch in the history of being is enframing which is the essence of technology. This mode of being is the human fate in the sense of an inevitable, unalterable course to challenge the world and, thus, reveals it as a standing reserve". (Achterhuis, 2001:6)

The *standing reserve* referred to here is the way the world appears or is revealed through modern technology as something to be controlled, manipulated and exploited by human beings. Can people fail to realise that modern technology reveals the world, and thus gives way to a particular mode of being? Instead, people think that this is not only 'just the way that the world is', but also the 'only way that the world *could* be'. Human beings have begun to see everything as a means for satisfying human ends, because the essence of technology is to *enframe* and this fact is hidden in the modern technology. Unlike traditional technology, that only *reveals* the world, modern technology also functions as an *unconcealment* of itself as well as a mode of enframing.

Heidegger saw this unconcealment as leading to what can be termed a *dystopian essentialism (*Kiran, 2009). Because modern technology tends to to render people

'subordinate', which in turn means that: "technology represents a negative take-over of truth and meaning" (Kiran, 2009:124). For Kiran (2009), this negative problem should be resisted, defending the idea that modern technology is revealing, without submitting to the depressing conclusion that "we are subordinate to technology" (Kiran, 2009:124). However, Albrechtslund (2009) disagrees, because the answer is not to reject that modern technology *is* an unconcealment of itself. He thinks that this is only one specific mode of revealing the world, and interprets Heidegger as suggesting that it is only *through questioning* technology that people can become aware that it is in itself an unconcealment. What is the *danger* of modern technology – it's mode of revealing – is also seen to be its *saving power*. This means that human beings should question the essence of modern technology – *viz*. being as it is constituted by modern technology – rather than rejecting modern technology. If Heidegger's analysis is that technology simultaneously reveals and conceals – users "should open up to this essence of technology" (Albrechtslund, 2009:5). This attitude reconnects to the idea that people or *Dasein* – are not passive about their mediations with other beings alongside their being-in-the-world!

Heidegger was writing just after the turn of the century, when modern technology was still a dynamic and developing phenomenon. As many of the 'second wave' philosophers of technology like Peter-Paul Verbeek, a professor of philosophy of technology at the Department of Philosophy, University of Twente, The Netherlands, who depart from Heidegger in various ways have noted, Heidegger has concerns which chime with the time in which he was writing. While he was considering technology *in general* – he also defined the *essence* of technology (Kiran, 2009). For Verbeek (2005), Heidegger also recognized that the industrial context influenced his thoughts:

> The repetitive, monotonous character of assembly-line work appeared to herald a new kind of mass society and homogenized existence; cold, anonymous industrial complexes seemed to indicate the onset of a reduced relation to the world. But the classical diagnosis appeared to be premature, and failed to foresee the ways in which technological society and culture would develop. Today, over half a century later, I see that humanity has not been entirely swallowed up inside the production apparatus, and is able to

> approach reality not exclusively as a storehouse of raw materials. (Verbeek, 2005:1)

Verbeek raised an important historical point: the philosophy of technology has never developed in isolation from progress, concerns and experiences in the wider society. As I have suggested, Heidegger was not just a philosopher of technology, but also concerned with *being* in general, and often being in a more existential and even political sense. In times of great social dynamism and upheaval, like the Industrial Revolution of the previous century, a fully-fledged capitalist society raised both praise and dissent amongst philosophers and other thinkers. The great depression caused resignation and horror amongst intellectuals – who felt the need to rethink whole areas of human and social experience. According to Verbeek (2005), in the early twenty-first century, there was the benefit of hindsight of the early twentieth century, which means that there were grounds to reject the idea that technology could alienate people from the world and impede them from living an 'authentic' existence. Heidegger was ambivalent about the *potential* of modern technology: as having the potential for *both* dominating and liberating mankind. Later, both Hegel and Latour, philosophically questioned technology, and the importance of of having a genuine public discussion about its role in society and relationship to the individual.

So, rather than an outright rejection of Heidegger's view that modern technology specifically is an unconcealment, or that technology has a large role to play in contemporary society in general, I think that the way in which technology confronts people in their everyday lives needs more analysis. Verbeek (2005) comments that early twentieth century philosophers saw technology as a form of alienation, as society is always influenced by assumptions and limitations of its time. Also a key problem with Heidegger is that he was stuck in a *transcendental fix*, trying to analyse technology *one-sidedly* from its *conditions of possibility*, and then applying his conclusions to technology (Verbeek, 2005:2). In fact, these fundamental changes in attitudes of society are characteristic for modernity and post-modernity.

2.3 The body extension thesis

The role of technology in mediating people's relationship with reality as drawn from Heidegger could be interpreted as his concept of technological mediation taking on a more contemporary form. For Heidegger, this *readiness-to-hand* was not phenomenological different: the hammer and the arm become one because the hammer can be conceptualised *as an extension of* our arm. In agreeance, Merleau-Ponty described, "how a blind man is not so much conscious of his cane as of the world encountered through the tip of the cane" (Kiran, 2001:125). This is because for Merleau-Ponty the:

> " …body image is not a representation, but presents itself to us through our moving around in-the-world – it is, so to speak, thrown back at us from the world as it is revealed in our movements. Consequently, since the cane is critical in revealing the world, it is comprehended as a part of our body. It is ' a bodily auxiliary". (Merleau-Ponty 1962:152)

The influence of Heidegger on Merleau-Ponty is evidenced by the idea that our body image is *thrown back* by the revealed world. In this light bodily extension can be seen as a natural, or even logical, consequence of the self through cane. While the cane is critical to this revealition, it is not only comprehended by us as a thing *in itself* or *in the world*, but rather as *a bodily extension*. The blind man *sees* the world by using the cane; which is one particular way of revealing the world. The user *perceives* the world inside an everyday sense of perception, as opposed to the more general notion of world *revealing* itself as articulated by Heidegger. Furthermore *bodily extensions* are too human tools regardless of the historical period in which they exist; which is *contra* to Heidegger' s contention that there is something fundamentally different about the role of technology in pre-modern Europe compared with modern Europe. The basic thesis of bodily extension can thus be stated:

> When a human being uses any object *qua* technological tool in it's *readiness-to-hand*, then it functions *as an extension of* that person's bodily abilities. (Kiran, 2009)

The theory of bodily extension thus draws out a particular aspect of the relationship between tools and people, which is based on Heidegger's notion of *readiness-to-hand*, and focuses on the phenomenological experience of tool-use. Technological objects can further be understood as *extending our practical space* in several distinct ways (Mitcham 1994:176f).[10] This reflects the way in which, when used as *ready-to-hand*, tools are used to do or achieve some practical task or other. For example, the hammer can be seen to extend the physical reach of our arm, and extend the practical use of arm, viz. hammering a nail into a wall. A person's *practical space* is thus physically located, and hence can be physically extended. But it also concerns the sorts of things that person can *do* in the world. I can therefore, build on the simple body extension thesis to incorporate the idea of practical space extension:

> When a human being uses any object *qua* technological tool in its *readiness-to-hand*, then it functions both *as an extension of* that person' s bodily abilities, and *as an extension* of that person' s practical space by extending their range of possible actions. (Kiran, 2009: 126)

A range of thinkers draw on this expanded definition. As example, for Feibleman (1979), it means that one can understand more generally that tools and people are connected in a totality called an *organ-artifact circuit*. This bears some similarity to Heidegger's concept of the *equipmental totality*. However, it differs in the way in which it narrows the relationship between people and tools to one of *bodily extension* and *practical space extension.* This means that "the stove is an external stomach, and cooking a form of pre-digestion; computers are external minds: they calculate faster than mathematicians and manipulate abstract thought with great skill" (Feibleman, 1979:39). All kinds of tools are understood primarily in reference to the *human body* specifically. For Kiran (2009), this

[10] Mitcham, C. (1994) Thinking through Technology: The Path between Engineering and Philosophy. Chicago: University of Chicago Press.

notion of bodily extension "fits well with a commonsense conception concerning tool use" (Kiran, 2009:126), whilst also falling short of properly describing people's relationship with technology. I now turn to various objections to the body extension thesis.

2.3.1 Problems with the body extension thesis

I have already raised the issue of whether it is possible to talk about tools as *bodily extensions* and *extensions of practical space* without considering the historical context in which those tools are used. For Heidegger, although all tools have mediated people's being-in-the-world, they have done so in fundamentally different ways from pre-modern to modern societies. Partly the motivation to avoid what was seen as the negative conclusions by Heidegger concerning modern technology, have caused both a revealing and a concealment (i.e. Verbeek, 2005), also what was seen as Heidegger's *dystopian essentialism* concerning technology (i. e. Kiran, 2009) often rejected the idea there was a fundamental difference between pre-modern and modern societies. The problem arises when it takes on the concept of bodily extension. Here, technologies are seen as extending human bodies, an aspect that can be applied to *all* technologies of today. However, the analogy between the hammer and my arm might seem to break down when considering autonomous agents or pro-active computing systems like virtual pets.

There are a number of theorists who try to capture this expansion of this *functional closeness* between people and the tools they use. They have tried to make sense of the fact that modern technology functions very differently from pre-modern technologies. Modern technology has a significant amount of *autonomy*. For example as Mitcham suggests:

> External input undergoes further transmutation with the development of, first, the heat engine (steam engine, internal combustion engine), then electricity, to drive a mechanical prime mover. The power of the steam engine exponentially exceeds any previous energy source;

> electricity takes such powers into realms of scientific and conceptual abstraction. (Mitcham, 1994:185)

In this quote, unlike the hammer which I have to move by myself, an external energy source, such as steam and later electricity, has changed the relationship any one person has to the tool they are using to complete a task. When machines seem to work by themselves, they have little or no need from any physical interference from people.

For Gehlen (1980), a level of abstraction is required to make good sense of modern technology, but also there is a *functional closeness* between tools and the people who use them. Now tools are an *objectification* of human labour, understood as human bodily abilities specifically. This in turn means that modern technology leads people into a 'new kind of thinking' about technology, which is a "more definitive for the step into modern technology than the material artifacts themselves" (Kiran, 2001:131). This makes a firm distinction between what I think about technologies and what the technologies are as material artifacts themselves. This distinction changes according to different historical periods and social contexts. I relate to technology as a subjective experience and I use technology to make an interpretation of the world. For Gehlen, the implication still is – "to deal with modern technology means to deal with how I associate and interact, scientifically, politically and economically, with technology" (Kiran, 2001:131). In pointing to the importance of the wider social and historical context in fixing how I deal with technology in the modern age, it would seem that Gehlen acknowledges that there is in fact, more mediation between people and technology in modern society as compared with pre-modern societies. This does suggest that the body extension thesis captures something very general about people's use of technology; however, it fails to account for how modern technology is experienced by individuals in modern society.

However, for Kiran (2009), the body extension thesis should be rejected for two further reasons. On the one hand, there are technologies, which it is claimed do not 'fit' the notion that technologies extend our bodies in any significant sense, for example, autonomous systems. On the other hand, the thesis should be rejected because it fails to

disallow technological instrumentalism or technological essentialism, since it is compatible with both. Technological *instrumentalism* describes the idea that on the thesis, technologies simply extend human bodies and practical space, without significantly *mediating* our interactions with the world, or seeming to change how I am-in-the-world. Technological *essentialism* refers to the way in which on the thesis, how I handle the technology is determined by the technology (Kiran, 2009). Contra to Kiran, it could be argued, that particular technologies can be used to extend the user's bodily capabilities or practical space and this does not imply that *how* a user uses those technologies is *determined by* the technology; as these technologies have been designed with a specific purpose – or extension – in mind, a suitable theory of the relationship between people and technology does not necessarily need to "prevent the implication" (Kiran, 2009:134) How the technology is used is often determined by the technology itself, and it is not immediately obvious what determining can *mean*. If Heidegger's idea that modern technology is also a *concealment* as well as a *revealing* of the world: then he does not do to try to theorise it away, rather, it can be held, (*pace* Heidegger), as he described in the early twentieth century technology was both a co-constitution of our being-in-the-world, and a concealment of other ways of being-in-the-world. By recognizing that the user can *change* the way he or she relates to technology, and the role that technology plays in society, this central aspect becomes apparent.

In relation to technological bodily extension, I argue that certain sorts of tools seem to function for us, despite the ability of the theory to abstractly render particular technologies – pro-active or autonomous computer systems – as somehow extensions of human abilities. This does not adequately capture *how* people relate to technologies in the contemporary world. If one appraises the way in which new technologies function in people's everyday lives in contemporary society, and on this count, the thesis of bodily extension, fails.

In conclusion, Heidegger's classic phenomenologist account of technological mediation has been explored in more contemporary form through the bodily extension thesis. While I have acknowledged the important groundwork layd by Heidegger, and pointed out how

the thesis of bodily extension fails to account for people's experiences of digital technologies of the twenty-first century.

I now turn to the 'second wave' of philosophers, who are characterized by an *empirical* or *post-phenomenologist* account of the relationships between people and technology, in order to extend a number of critical engagements with Heidegger, and to lay the groundwork for the remainder of my argument in this thesis.

2.4 Don Ihde, the post-phenomenologist

Don Ihde (1934-), an American-based contemporary philosopher of technology and science, also studied the phenomenology of Heidegger and Jaspers. Ihde's academic work focused on the fields of hermeneutics, embodiment and practice and particularly on how technology mediates and structures people's experience and perceptions of the world. In this respect, he draws on the earlier work of Heidegger, Husserl, and notably aspects of the phenomenology of Merleau-Ponty (Albrechtslund, 2008). Ihde's seminal book *Technology and the Lifeworld* (1990) draws together the different aspects of his work on the cultural and experiential role of technology.

Ihde can be understood as a pioneer in two specific ways: first as one of the first philosophers to study technology in the US and second to take a phenomenological approach to the study of technology when this was not a dominant view. Ihde has developed his study of technology in the context of a reasonably wealthy, forward-looking society and growing world power, America, while Heidegger wrote some of his most influential work whilst based in Europe, during the uneasy period of rapid mechanisation and urbanisation, and two devastating World Wars. Yet the need to counter a seeming Heideggerian pessimism about technology has not really motivated contemporary thinkers to break from aspects of Heidegger's thinking, but the need to think afresh about that role new technology can play in people's lives in a very different world. For Verbeek (2005), this can be called 'post-phenomenology' which he

understands as arising to bridge the gap between philosophical realism and philosophical idealism as articulated by Husserl and Merleau-Ponty, because it attempts to *analyze* – rather than simply describe – the relationships people have to the world.

One might understand this world as the Western world in general (including Middle East, Australia and Far East) – as being *permeated by* technology in ways fundamentally different from the early twentieth century. Based on a *global* system of technological communication and a *near-global* infrastructure for creating and transmitting energy and producing and distributing technological products, whole areas of industry have become completely mechanised on increasingly large scales, and people have much more wealth, social stability and peace than the society Heidegger would have been accustomed to. Today, people are surrounded by technology in their everyday lives, and, importantly, have much more free time to spend and technology is not just used in the workplace to produce goods, as Heidegger saw and considered a form of alienation, but it is also used in the home as labour-saving devices. This would suggest, of course people have very different experiences of technology, relative to the contexts in which they encounter it.

2.4.1 Perception and experience

Ihde's analysis of the *relationship* between people and technology, the experiences this gives rise to, and the function of technology in our *lifeworld*, is a methodological divergence from Heidegger. Rather than following Heidegger's project of uncovering the abstract *essence* of technology in general, Ihde is instead concerned with "the role of concrete technologies for human life" (Albrechtslund, 2008). This empirical turn of Ihde has been connected on by Verbeek:

> "Don Ihde's approach…accomplishes this turn from Technology to technologies within phenomenology. In his thinking he breaks with the phenomenological tradition's conception of technology as stemming from a specific and limited way of disclosing reality. Ihde seeks to reflect about technology, as it is concretely present in our daily existence: in the

> form of technological artifacts. Instead of questioning 'backwards' he questions 'forwards'; that is, instead of reducing technological artifacts to the technological form of world-disclosure that makes them possible, he asks what form of world-disclosure is *made possible by* technological artifacts." (Verbeek, 2001:122-3)

By taking a fresh look at how technology is presented to us in our everyday world: with what *form of world-disclosure* technologies make possible, a social world thick with ready-made meaning that has become lost by the physical sciences, or as Verbeek suggests, of protesting "against the absolutization of the scientific perspective" (Verbeek, post: 105). For Ihde, this means a refocusing on human experience, and the *structure* of this experience, because there are two dimensions of experience: the bodily dimension of sensory perception, called *microperception*, and then the cultural or hermeneutic contexts that make human experience meaningful, called *macroperception* (Ihde, 1990:21,23). For Ihde, these aspects of experience can be understood as connected to the human lifeworld, and there can be no macroperception without a microperception, and vice versa. Kiran (2001) argues that Ihde's understanding of experience *qua* perception of the world can be connected to the *intentionality* of our experience. By "being intentionally directed at aspects of the world *through* a technology the individual transforms the intentional experiences in accordance with the technology itself" (Kiran, 2009:135). In other words, different artifacts change our experience of the world and for Kiran (2009), if the tools are different, our experience will be different. For Ihde, this also underpinned by the assumption of a *primitive* relationship between experience and what is experienced:

> A phenomenological account ... always takes as its primitive the relationality of the human experiencer to the field of experience. In this sense, it is rigorously relativistic. The relationality of human-world relationships is claimed by phenomenologists to be an ontological feature of all knowledge, all experience. (Ihde 1990:25)

For Ihde relationality is an ontological part of experience. Verbeek (2001) affirms that experience is always experience of something; which is to say that all experience is

intentional. Yet, for Ihde, human experience is specifically related to the way in which an individual *perceives* the world, so that perception is where subject and object – person and world – become intertwined. For example in a modern microscope: "the microscopic presence is amplified through the probe thus extending my experience of the board to a level of discernment previously unnoted" (Ihde 1979:9). Thus, the idea of an *extension* is not of my body or practical space, but primarily for the purposes of my visual *experience*. Moreover, only certain aspects of my perception are enhanced by the microscope, other aspects, for instance the ability to take in the whole room in which the user is sitting, are reduced. This is called a *magnification-reduction structure* by Ihde (1990:76), because it is further co-constitutive, a *revealing/concealing structure*, wherein the use of technology can reveal the world in some ways but conceals it in others. (Kiran, 2009) Heidegger would suggest that if modern technology is used in a rapidly mechanizing society, a form of *concealment* as well as revealing always occurs and this is why it reduces the world into a place for human manipulation and exploitation. How can we apply these general concepts of revealing and concealing to particular technologies in isolated contexts? What effect can they have on our perception (and hence being-in-) the world? By concentrating on *how* technology can disclose the world for us, I now turn to a part of this chapter where I explore the various ways that people enter into relationships with technological artifacts.

2.4.2 Relations between people and technology

As Ihde suggested, there are a number of types of relationship that people can have to technology in contemporary society, depending on what *sort* of technology they engage with. His analysis was a consequence of a long process of research into technology, which "attempted to understand technology as a product of human activity that was socially constructed, as opposed to developing autonomously and outside the control of human beings" (Verbeek, 2005:101). This is one of the main ways in which *postphenomenology* broke from the classic phenomenologist approach, which was a *social constructivist* because it suggested that technologies played a more *active* role in social interaction than previously suggested. Technology could determine human

decisions, and hence reduce technology "to social interactions therefore, fails to do justice to the active role played by technologies themselves." (Verbeek, 2005:102). According to Ihde the types of relations people can have to technology can be divided into three types: mediating relations, alterity relations and background relations. Mediating relations describe the way in which the user relates to the world *through* technologies, but are not "directly in bodily-sensory experience present to the world but are so *via* technological artifacts" (Verbeek, 2001:4). For example, when I speak as well as hear other people *through* the telephone. For Ihde, these types of relationship can be understood with reference to Heidegger's analysis of the way tools are ready-to-hand, as was seen earlier. Verbeek (2001) explains that there are three respects in which Ihde draws on Heidegger, As was seen earlier, tools are part of an equipmental totality, and they have what could be described as an *instrumental intentionality*. Thus, the way in which the tool is directed at the world is just as important as human cognitive response. And third, the tool is a means to the experience, rather than an object of the experience, drawing on the way Heidegger understands a tool as being ready-to-hand when in use.

Here, Verbeek (2001) posits that Ihde goes beyond Heidegger since the latter thinker is concerned with the role of tools in practice, rather than experience *per se.* Instead Ihde draws on Merleau-Ponty, who seeks to understand and articulate the different relationships the user can have to the world where those tools are presented to him or her, and to describe the sorts of resultant experiences this allows us to have. Tools *structure* our experiences in different ways. Therefore, Ihde developed this schematization:

unmediated perception: I–world
mediated perception: I–technology–world.

Ihde believed that, whilst all human experience *qua* perception is mediated, not all perception is mediated by technologies. In particular the *embodiment relation* describes how when I use a technology to do something, but I am directed through the technology *beyond* that technology and *at* the world (Kiran, 2009). For example, when I wear a pair of glasses, I am directed through the medium of the glasses to look at the world. The

glasses are not a present of our general experience. However, when the glasses break and no longer work, they become present to our conscious experience, as a direct object of our cognition. I suggest, that there is a particular level of transparency to embodiment relations, yet they are nevertheless a "means of experience" (Ihde 1979:8, cf. Ihde 1990:73). *Hermeneutic relation* occurs when I relate to the world *by means of* an artifact, and that artifact is not transparent as in an embodiment relation. Rather, the artifact in this case "provides a representation of the world" (Verbeek, 2001:6), which must be interpreted. For example, a thermometer represents the world in a particular way – it represents the temperature on a scale – and the results must be interpreted, in order to be understood. Both types of mediation relation shape how people experience the world in significant ways.

In the *alterity relation* people do not only relate to the world through or by means of technology; rather, they are related *to* or *with* some technology or object. For Kiran (2009), the artifact is the terminus of both technological action and intentional directedness. He says: "I do not enter into the relationship with technology to 'do' or 'achieve' something 'in the world', nevertheless, there are consequences in the world of our entering into a relation with the technology". Verbeek suggests, that "this set of relations can be characterized as that of a quasi-other" (Verbeek, 2001:6). For him the technology is an 'other' but, because it is not a real person - the technology is not a real other, but a 'quasi-other'. Verbeek is firm that whilst people anthropomorphize technology in various ways, for instance naming their cars or thinking their computers have mood swings, that "a technology is never a genuine other" (Verbeek, 2001:6). I think, that the quasi-other captures the way that, in alterity relations, the technology seems to possess a kind of independence or autonomy of the person that uses it. For example, robots, vending machines or ticket machines, can change the way in which the user experiences that technology, and hence how it mediates our relationship with the world. Perhaps the alterity relation also suggests that the world is organized in a meaningful way by technologies. (Kiran, 2001)

The third type of relation is a *background relation*. This occurs when I have a relationship with a technology, but that technology is not central to my experience. Rather, the technology could be said to *contextualise* my experience. Thus, technology sits in a background relation to me and it is not consciously experienced. For Verbeek (2005), as these kinds of technologies are both present and absent for us, they can be said to have an *absent presence* (Verbeek, 2005:8). Ihde distinguishes two different kinds of background relations: on the one hand, those technologies that can be described as automatic, or semi-automatic. For example, the central heating is often switched on, and will ensure that the temperature in the house is constant. I become so used to the working of the heating, and it is no longer something I think about. However, when it becomes too hot, or too cold, then I think about the central heating, or it enters my *intentional directedness*. Similarly, other technologies often include household technologies, like fridges, washing machines, and coffee-makers. The second kind of technologies that feature in a background relation can be called *shelter technologies*. These include things like houses, blankets.

2.4.3 Mediation in perspective

The above three types of human-technology relations structure people's experience in different types of ways. Of these different types, – the embodiment and hermeneutic relations – can be said to be relations of *direct* mediation. Direct forms of mediation can affect our microperception; indirect forms of mediation can affect our macroperception. Certain technologies can "co-constitute…*and structure our lifeworld* because they provide a context in which we have experience, but also in that they area potential as we move around in the lifeworld" (Kiran, 2001:147) Technology can be said to *permeate* our lives.

For Verbeek (2005), there is a further conclusion to draw on how embodiment and hermeneutic relations mediate people in relation to the world. In this chapter, I have noted the way in which several philosophers seem to question the traditional dichotomy

between subject and object, as it might be understood in Cartesian terms. Perhaps it is only in Ihde's later work that the subject (person) and object (world) are interrelated, but there is a residual ambiguity about how exactly this might be so.

> The relation between subject and object always already precedes the subject and the object themselves, which implies that the subject and the object are mutually constituted in their interrelation. In any relation between subject and object, both are brought into existence in a specific way, and both subjectivity and objectivity acquire specific shape.
>
> When analyzing the mediating role of artifacts, therefore, this mediation cannot be regarded as a mediation "between" subject and object. Mediation consists in a mutual constitution of subject and object. (Verbeek, 2005:9).

I have quoted this passage in full in order to appreciate what could be considered the full force of the post-phenomenological perspective when applied to technology. This is to sharpen the idea that mediation is a co-constitution of both subject (person) and object (the world). While technology can be typified into different relationships of co-constitution, the concrete role of technologies in our everyday lives needs further analysis. Verbeek (2005) suggests that both subject and object are co-constituted – or *do* – shift our relations. For example, somebody who normally wears glasses to read *is* different, and at the same time behaves differently without wearing those glasses in the world. I can appreciate this *mediation of subjectivity and objectivity* by considering the everyday experiences of some users (handicapped people), since their daily activities are profoundly shaped by the fact of their wheelchairs. For example, they may perceive the world from a sitting position, as opposed to a standing position (Verbeek, 2005:9). Here, it is possible to understand the concept of *technological mediation* in a more profound sense, both in terms of co-constituting the person and the world in concrete situations, as well as mediation of subjectivity on the one hand, and objectivity on the other. This concept reoccurs throughout this thesis because it sheds light on the concepts of intimacy and identity.

2.5 Peter Paul Verbeek on technological intentionality

As shown above, Verbeek (2005) often 'supplements' Ihde's typography of technology relation and in later chapters, I will examine more of his reflections when I consider the concept of *identity*. However, first it may be important to unravel the related concept of *intentionality*, in order to examine the relation between human cognition with its intentionality, or directedness and technology designed to also have an intentionality, or directedness. Although the first idea has been explored, I have noticed that there can be little consensus about whether or how human cognition is intentional. It can be said that people tend to be *aware of* things, or at least that they experience their own experiences as *being about* things that are outside of or external to them in some way. Further, even if it is acknowledged that there are meaningful non-intentional conscious states, this need not entail that there is no such thing as intentional states. However, the second idea that technology has an *intentionality* or directedness is even more contentious.

I think that entities must be both conscious and self-conscious in order to have intentional states, and unfortunately, both Ihde and Verbeek, have a very loose and broad definition of intentionality. They use it to infer *directedness* or *aboutness*. However, there are many ways in which non-human entities are *directed at* the world. For example, I could say that sunflowers have conscious states in the way that human beings do. If one does such an account of being *directed at*, it would seem to undermine the case that modern technologies are intentional.

Further, I want to make a preliminary note that many of the technologies used as examples of things directed at the world are simply *about* the world in some loose kind of way – for example, thermometers *represent* the world. Yet again, this might cast the net too wide, as sixteenth century paintings also *represent* the world, as do cave paintings from prehistory or marks on a wall to measure a child's growth, yet I might not want to say these are specific forms of intentionality in the way needed to say that technology, and particularly modern technology, is intentional. In principle, I could also go too far the other way in saying that potentially anything is about the world, if that is the way I want

to experience or understand it. For example, I may come up with some way of fir trees being about my mood, or the brightness of Alpha Centauri representing density of cloud cover in the night sky (which in some way, it actually might). Yet I might not want to say that either are *intentional* in the same way Ihde or Verbeek might *want* technologies to *have intentionality.*

Instead, technologies are a product of human intentions, designed for human uses, so in order to ground the idea of intentions in modern technology, as opposed to any other objects that might represent the *world* the concept of *technologically mediated intentionality* could be more significant. Two other forms of intentionality: hybrid intentionality and composite intentionality may also help to describe the *merging* between a human being and technology.

While the traditional approach to philosophy of technology holds that there is a sharp ontological distinction between people and technology, with the first considered "active and intentional" and the second "passive and mute" (Verbeek, 2008:4 referencing Latour, 1993; Heidegger 1977), several authors have claimed that this is no longer the case and that we are now *merged* with technology in significant ways (Ihde 1990; Haraway 1991; Latour 1993; Hayles 1999; De Mul 2002; Irrgang 2005). For Verbeek (2008), Heidegger can be understood as seeing human beings as directed towards reality, and Ihde builds on this core phenomenological insight by introducing the specific notion of *mediated reality*. This concept relates to the thought that if human beings could not have had many new experiences without the help of certain technologies, then those experiences must not be entirely human. Verbeek termed this concept "cyborg intentionality" (Verbeek, 2008:4). It could be argued that relationships between people and technology *prior* to those sketched by Ihde, significantly the embodiment and hermeneutic relationships, are characterised by a genuine *merging* rather than an embodiment of the human being. In other words – "by altering mood through anti-depressants, or installing artificial valves on hearts, a *new* kind of entity is created that goes beyond the human being" (Verbeek, 2008).

In relation to the concern of this thesis on the subject of *intimacy*, the idea of 'radically' rethinking the relationship between human *subject* and technological *object* shifts our understanding of humanism itself. I think that many theorists coming from the post-phenomenological perspective have already raised the moral status of the human being. So, for Ihde, there is an important methodological departure from Heidegger in terms of general/specific or abstract/concrete, and for Verbeek:

> Humanism, according to Heidegger, approaches the human being from the perspective of the animal: as zoon logon echon or animal rationale – an animal with speech and reason. This continuity between human and animal, Heidegger says, ignores the radical difference between them, which he locates in the human capacity to think the 'being' of beings. Sloterdijk…says…technological developments have now made it possible to cultivate human beings in quite a different way: by literally 'breeding' or 'growing' them…Sloterdijk urges that I should take responsibility for the powers I have developed. I should get beyond the humanist preoccupation with texts, and start thinking about moral guidelines for how to use the new 'anthropotechnologies'. (Verbeek, 2008:392)

As can be seen technologically mediated intentionality can take a physical form, in which it makes sense to make an ontological distinction not so much between people and technologies, but between technologies being *used by* and technologies being *incorporated in* human beings.

2.5.1 Intentionality: from composite to reciprocal

Thus, what about mediation by Ambient Intelligence and Persuasive Technologies? Ihde (1999) uses four distinct formulations to capture different types of mediated relations that can be obtained between people and their technology. While background relations are unique in working at the macroperceptual level, the other types of relation work at the microperceptual level. In all four instances specific mediations that the technology gives

rise to could not have obtained without those technologies. Therefore these formulations "are not entirely 'human'— human beings simply could not have such experiences without these mediating devices" (Verbeek, 2008:390). I suggest that persuasive technologies need special consideration of the mediations they give rise to, since they often *exclude* embodied relations. In embodiment relations there is no clear *interaction*; whereas, both hermeneutic and alterity relations aim to capture the interactional quality of certain types of technological mediations. These are similar to those arising from persuasive technologies. In this way, Ihde's (1999) hermeneutic and alteritive relations can be used to make an analysis of human-technology relations arising from persuasive AmI technologies.

It is further important to notice how the concept of *intentionality* functions in alterity and hermeneutic relation formulations, since the arrows used within these schemes indicate the direction of human intentionality (Verbeek, 2008:389). The placement of these arrows often denote that intentionality comes from *relationship* itself, rather than being attributed to the human being 'in isolation' within this relation. Thus, intentionality becomes a *constituent* of the human-technology relationship. To analyze this relationship in more detail, I think it is necessary to extend the account offered by Ihde.

As Verbeek also suggests, in order to capture the notion of *intentionality* as a *constituent* of the alterity and hermeneutic relationship, it is necessary, to introduce the concept of *composite intentionality*, which refers to "situations in which not only human beings have intentionality, but also the technological artifacts they are using" (Verbeek, 2008:390). For example, inside the relationship between a person and a thermometer, the relation can be intentional, in the sense of a specific *directedness.* Hence, "when this 'directedness' of technological devices is added to human intentionality, composite intentionality comes about: a form of intentionality which results from adding technological intentionality and human intentionality" (Verbeek, 2008:392-3).

Verbeek's *composite intentionality* thus goes beyond Ihde's idea of technologies that are directed at the world (such as sound recorders), and is understood instead as constituting

a kind of amalgam of human and technological intentionality. This composite intentionality functions in Ihde's hermeneutic relation (e.g. a thermometer representing reality).

In order to conduct an adequate analysis of the composite intentionality in terms of Don Ihde's framework, the human-technology-world scheme needs to be augmented. By witnessing the phenomena of composite intentionality, a technology-world relation, rather than a human-world relation is mediated by technology. This implies that there is a double intentionality involved here: one of technology toward 'its' world, and one of human beings toward the result of this technological intentionality. Humans are directed at the ways in which a technology is directed at the world.

In order to illustrate the expanded schema of composite intentionality, Verbeek changed the dash between the artifact and the world from Ihde's hermeneutic relation into an arrow:

I → (technology → world)

As this schema shows, the *intentionalities (viz.* directedness) of technological artifacts play a constituent role in hermeneutic relations; hence, "humans are directed here at the ways in which a technology is directed at the world" (Verbeek, 2008:393). The technology has a *directedness* to the world, and the person in turn, has a *directedness* towards the technology.

A further extension of Ihde's hermeneutic relation can be seen in the concept of *reciprocal intentionality*, which generalizes the alterity relation in particular (Heersmink, 2008:78). This concept strengthens the intentionality via the directedness of that technology. For example, a robot listening to its owner's instructions could be said to establish intentional relations to that owner in something like the same way that the owner establishes intentional relations to the robot. Hence:

(I $\rightleftarrows$ technology) – world

The bi-directional arrow seeks to capture the 'two-way' intentionality between robot and user. In the example, of Kismet [11] AI researchers were attempting to explore this intentionality. The dash that connects *both* to the world remains in the background, which seeks to represent the primacy of the robot-human relationship rather than the world. This type of mediation captures mediation that arises when persuasive technologies are applied.

It is hoped that through Verbeek's (2008) notion of *composite intentionality* and Heerskmink's (2008) notion of *reciprocal intentionality*, it might be possible to develop a suitable theoretical framework to extend Ihde's (1999) hermeneutic and alterity relations to deal with AmI and persuasive technologies from a new perspective.

In the last decade, this perspective has come about because "technological development has reached a stage in which technology has started to interfere explicitly with the nature of human beings" (Verbeek, 2008:8). Given that tool-use has been a standard issue throughout human history, only now the concept of *explicit* interference with human nature becomes articulated. This interference seems to be justified by *invasive technologies* – those that are literally inserted into the body, such as heart valves or implants to help people see. This explicit interference is related to the fact that for a long time technologies have been augmenting human bodily processes in a variety of ways. Perhaps something *explicit* is happening, because in an individualized, physical form of the stock Heideggerian contention, *modern* technology causes significantly difference to human world-experience, this is a particularly philosophical, moral and social concern. As Verbeek concludes, because it draws on another quintessential modern philosopher Friedrich Nietzsche, who was concerned with such existential and moral questions:

[11] www.ai.mit.edu/projects/kismet/

> When Friedrich Nietzsche (1969/1883) wrote the famous words that "Man is a rope, stretched between the animal and the Übermensch", he could not possibly foresee that they were prophetic in a very concrete and material sense. By re-articulating phenomenological and philosophical–anthropological concepts philosophers can contribute to a better understanding of the "posthuman" or perhaps even "transhuman" beings we are becoming – and to the development of a better sense of the limits of humanity. (Verbeek, 2008:8)

This concern with the *limits* of humanity is echoed in Heidegger's concept of the *possibilities* that are both offered and undermined by modern technology. These reflect a genuine ambivalence about the modern age, as well as a sense of man as being in a constant state of *becoming.* For all concerned, however, technology, did take a *mediating* role in this process.

I also understand this mediation as rooted in the material aspect of technologies themselves. And therefore, I think that one interesting approach about the role of technology in everyday life has arisen with the concept of 'affordance'.

2.6 Ecological psychology and affordances

In academic discourses, the role of design and ecological psychology is relevant to the argument of this chapter as it touches upon the function of technologies in people's everyday lives in contemporary society. Also, the psychologists question technological mediation from a useful viewpoint, *viz*, their intended function in particular social contexts.

The ecological psychologist James J. Gibson (1977; 1979) once coined the concept of *affordance* to mean the "actionable properties between the world and an actor". While affordances are a part of nature, some have been discovered whilst others have yet to be

understood (Norman, 1998). For Norman (1998), a distinction should be made between the 'affordance' and the 'perceived affordance' of an object. Through my own research I also found note that some ecological psychologists thought that the concept was ill-defined (Stoffregen, 2000), however, Gibson's definition can be used for signification delineation:

> The *affordances* of the environment are what it offers the animal, what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment. (Gibson, 1979:127)

Here, an *affordance* refers to what seems to be a property of some mind independent reality and at the same time, to a connection to a person or an animal. Therefore, to equate an affordance with a simple physical property of an object could be problematic. Gibson thinks that there is an inherent 'complementarity' to the concept, which could connote a 'relational' aspect. Scarantino (2003) explains that Gibson's complementary character of objects and people or animals in the shared environment was influenced by physics or metaphysics (such as mass and spin), rather than by standard phenomenological renderings. This leads to the need of better theories of perception and action to account for the way in which such affordances are relational. As Gibson pointed out, Gestalt psychologists, often focused on objects in particular contexts in terms of what particular organisms can *do* with those objects. In this light, Gibson saw phenomenology as being explicitly related to our *experience* of objects in the environment. He saw that what objects can 'do' in particular contexts could be 'imposed' by the people into those contexts. In other words, what objects could do had no 'ground' in those objects themselves, but where a relational concept of affordance by demand. Rather, Gibson posited, for example, that a postbox is *letter-mail-abilities* relative to an organism independently of whether it is experienced or perceived as such. This captures the way in which one could say the affordances of postboxes are 'mailable' because there

is a relativism built into the concept of *affordance.* This is not in contradiction with the idea of an objective reality already defined by physics, rather, it is logically dependent on such a reality. Perhaps these new, relational properties of objects in particular contexts for specific organisms could be a new project for 'ecological psychologists'. As Gibson suggests, an affordance could concern any kind of organism: a tree affords firewood for a person, and it affords food for a squirrel. This scenario is compatible with the idea of a specifically *human* lifeworld, or social context; yet, it does not make that context the only relevant one for discovering the affordances of various objects.

Because Gibson made a "preliminary step" in his attempt to ground affordances in a mind-independent, physical world, Scarantino constructed a more fine-grained account of *affordance* as a relational property:

> An item X is graspable relative to O in virtue of O's ability to grasp X, and such ability does not consist merely of the presence of a physical relation between the distance of X's 'opposite surfaces' and O's 'span of the hand' (e.g., the span of the hand of a person with a paralyzed open hand is unchanged, but the ability to grasp is lost). (Scarantino, 2003:3)

Here, the relationship of 'in virtue of O's ability to….X' becomes a further condition for an affordance. If, as Gibson's (1979) remarks, that affordances are *both* subjective and objective properties, and *also* they encompass *neither* solely subjective nor objective properties, a 'grey' area has emerged. Perhaps Ihde's notion of *mediation* must be further clarified to show how subjects are 'co-constituted' with regard to 'objective' and 'subjective' considerations. Affordances are distinct from secondary qualities like colour because they are "bestowed on the world in virtue of an actual or a potential *perceptual* experience of a subject" (Scarantino 2003:4)**.** However, secondary qualities such as colour, as opposed to primary qualities such as mass and spin, affordances seem to be 'response-dependent'. Furthermore, if affordances are either dispositional properties or objects, they form the bases for these dispositional properties of objects. However,

Scarantino (2003) remains neutral on this point, and claims that affordances are theoretically coherent and also necessary, even remarking that they add something to Lockean tripartite[12] understanding of the properties of objects as being primary, secondary or dispositional. I think it is interesting that this notion was picked up by a theorist who works outside of the phenomenological tradition. He captures the way the user interacts with objects in his or her everyday life – particularly with 'recent' technologies.

For Scarantino, affordances are understood as special kinds of dispositional properties. This is a truth-theoretic interpretation, one based on semantics. Affordances can therefore be understood as special kinds of predicates, like 'bump-into-able' or 'mail-able'objects. The truth-conditions for such sentences involve an object (X); a perceiver or observer of the object (O), Gibson's understanding of the 'complimentarily' of organism and object under the concept of affordance; and, significantly a *manifestation* (M) of the affordance. Therefore, the following truth-condition could apply:

> At time t, if background circumstances C were the case, then (if a set of triggering circumstances T were the case, then a manifestation M involving X and O would be the case with probability p). (Scarantino, 2003:8).

For me the importance of 'background circumstances' (C) and the time-indexing (t), can mutually serve to *specify* or *relativize* affordances inside particular contexts. The set of background circumstances (C) that must be fulfilled are considered to be 'normal' ecological circumstances. As I have previously suggested, there are 'accepted' ways that technologies function in particular social circumstances and limits to how these technologies function, but there are also lots of different possible ways in which they can function as well. Finally, the notion of *manifestation* should be explained in relation to 'function'. For Scarantino, "goal affordances" that manifest by doing, and "happening affordances", whose manifestation is a happening (Scarantino, 2003:10). The difference

[12] Lowe, E.J. (1995) Locke on Human Understanding. London: Routledge.

between those two is that one *event* could be called 'intentional' and the other not, because some are 'goal-achieving' and others are not. Finally, the set of actions which any organism X could accomplish over time t, will determine the current abilities of those organisms, and the degree of reliability with which their actions are carried out. For example, being able to juggle is a 'latent ability' whereas being able to walk around is current ability. Also, low and high degrees of reliability can be applied to these abilities.

I have attempted to cover a coherent account of *affordances* in the relevant literature, beyond the standard phenomenological projections by philosophers. For philosophers of science with a background in metaphysics affordances have explanatory power, as can be seen in this quote by Scarantino:

> The opportunity, a tantalizing one in my opinion, is that of acquiring an instrument to account for objects of perception imbued with a kind of meaning—ecological meaning—that we can legitimately suppose to be grasped in a similar way by animals, infants, and adult human beings, at least with respect to some affordances. For example, it seems quite possible that, despite their cognitive differences, an animal, a child, and an adult person may perceive the brink of a cliff as fall-off-able according to a common perceptual process. (Scarantino, 2003:12)

There is also the contention that the explanatory power of *affordances* can be linked to how these shared objects of perception can be experienced as meaningful. The notion that *affordances* can be applied across technological artifacts and more 'natural' features of the everyday world, like cliffs, may explain how similar the experiences of animals, children and adults can be alike. How can technological affordances relate to the phenomenological concerns I have previously sketched in this chapter?

2.6.1 Technological affordances and multistability

For both, Kiran (2009) and Gibson (1979), an affordance is *how we meet our environment*, which involves an intertwinement of people and technology. This meeting is connected to society, or an *intersubjective meaning* (Kiran, 2009:153). I agree with this general description of affordances but from a phenomenological perspective, a more moral and political dimension may cause reflection on the function of new technology in contemporary society. Along with the idea that tools have specific affordances or uses is Kiran's idea that there are *right* and *wrong* uses of tools (Kiran, 2009). Are tools used in the same way as they are designed to be used? Or for some other purpose? Tools have *logical constraints* and *cultural constraints* (Norman, 1998:2) and so there are particular conventions that govern tool-use, or the affordances of tools in particular sites of social practice. These kinds of conventions arise over time, and have become established – even in ways, which might seem strikingly arbitrary. This is revealed when particular tools are designed to fulfill particular briefs. For example as Norman writes:

> In all [computer] scrolling bars I have seen, there is a physical constraint as well: the vertical scroll bar only moves vertically, not horizontally. Once again, these cultural constraints are arbitrary… in the early days, a number of designs used the "inside-out" convention, so that moving the scroll bar down caused the text to move downwards, exposing the new text at the top of the screen. Today if we were to use that convention, it would be confusing, but only because the convention has already been established. (Norman, 1998:2).

It is important to note that, when theorists are considering technologies that are consciously designed to fulfill briefs in particular circumstances, a different set of considerations come into play. This is why Norman distinguishes logical – or physical – constraints from cultural – or conventional – constraints. Conventions emerge over time and once they become established, they indicate the 'right' way to do things, and other possible ways the tool could be used are designated 'wrong'. A user might recognize objects *qua* tools as designed things for human use, as opposed to seeing them as 'mere objects'. For example, he or she might encounter an object in a tool that can be

recognized as tool, but whose particular affordance he or she may not know. For Kiran (2009), this is a consequence of the fact that tools exist in an *equipmental totality*, and hence this is a tool *for another Dasein* or *another social context* (Kiran, 2009:156). Technologies are always part of a shared *human* world, or lifeworld. In agreeance Ihde posits: "Just as there is no such thing as 'an' equipment, neither is there an equipment without its belonging to some set of culturally constituted values and processes". (Ihde, 1990:126)

For Ihde, this is called *multistability* because technologies have different functions in different contexts. It captures a distinctively social, and ultimately changeable process: "the social dynamics that transform the stabilized meaning of a technology into another, stabilized, form" (Kiran, 2009:159). This concept of multistability reflects how the use of a technology can diverge from its intended design.

The idea of multistability further implies that there is no *inherent meaning* of technology *outside* of human, social practices; hence, there is no essence of technology, as Heidegger might have thought. However, Heidegger was not considering technologies outside of social practices when he attempted to define their *essence*. He also understood that technologies play different roles in different social context. This is why pre-modern and modern technologies have different *essences* or co-constitute different types of *Dasein*. Yet for Verbeek (2005), and Ihde (1993), the idea of multistability is relative to individuals rather than to mass concepts like societies in historical epochs.

2.7 Conclusion

Over the course, of this chapter I have presented a sketch of the concept of *technological mediation* as it has been approached and articulated over the last century, and considered issues of relevance to the general argument of this thesis. I have attempted to capture the important developments through theoretical comparison, methodological approach, and the initial dominant critical engagement with Heidegger in the form of the post-

phenomenological perspective. A certain degree of ambiguity of interpretation exists about his concept of *mediation* and his *Dasein* as a being-in-the-world. Verbeek (2005) charges that Ihde's hermeneutic and embodiment relations in particular must be supplemented with a more fine-grained notion of the interplay of human and technological *intentionality*. This reflects an ongoing concern, with how users understand human *subjectivity* in the contemporary world, but also more specifically grapple with their notion of *identity*. Throughout the second half of this chapter, I focused on the *perceptual* experience in particular when considering the mediating role of technologies. The investigation has revealed an ongoing and lively debate in philosophical literature concerning how technologies mediate perceptual experience on an everyday level. Also, *society* can establish or stabilize uses or meanings of technologies in particular contexts. As Kiran (2010) states, a technological action is co-constituted by the technology involved and the user(s) social aspects, such as practice, conventions, etc., in which the action is performed. I suggest, that this *social* dimension of the particular meanings of technology, can function in broader social, political and moral contexts and influence our practical activities. In this regard, the work of Bruno Latour offers an analysis about how artifacts mediate action (Cf. Latour 1992; 1994). Latour points out that actions are not only the result of individual intentions and the social structures in which human beings find themselves (the classical agency-structure dichotomy), but also of people's material environment. The concept introduced by Latour and Akrich to describe the influence of artifacts on human actions is entitled *script*. Like the script of a movie or a theater play, artifacts prescribe their users how to act when they use them. According to Latour, technologies themselves help to shape action and the physical and social consequences resulting from it. This means that, in order to understand a technological action, we have to study the ideas and conventions governing the involved technologies, and the role of the artifacts themselves in specific actions, rather than merely focusing on the motives and intentions of technology users. The next chapter hence considers contemporary technologies *qua* scriptural forces.

Chapter 3: Semiotics of technologies

> Everyware isn't so much a particular kind of hardware or software as it is a situation.
>
> (Greenfield, 2006: 31)

3.1 Introduction

This chapter begins to move from the more explicitly theoretical considerations of Chapter 2 to consider more specifically the particular social functions of persuasive technologies in practical use. In terms of the overall trajectory of the argument in the thesis, it is an extension of my analysis of the claim (C1) that intelligent technologies blur the traditional boundaries between people and things, and pertains to the specific objective (TO1): To analyze personal identity construction in relationship to ambient intelligence and persuasive technologies from various relevant theoretical or philosophical perspectives, with the aim of sketching a meaningful philosophical framework that is relevant to intelligent technologies in particular. In particular, this chapter does the bulk of the work in 'sketching a meaningful philosophical framework' for intelligent technologies, developing a nuanced reading of intelligent technologies *qua* scriptal forces. This leads onto a preliminary laying of the ground for an exploration of the thesis' second central claim (C2), that intelligent technologies change the grounds for ethical action and decision-making, especially concerning ethical responsibility. In particular, it begins to look at the specific practical objective (P03), how to assign ethical responsibility to people using smart technologies in particular ways.

The chapter articulates a semiotics of technologies, in relation to the notion of ‘scripts’. Drawing on the work of key theorists in this area, I explain how technologies can be most usefully understood as scriptural forces, how alterations in scripts lead to changes in people’s definitions of their practical spaces, and these in turn lead to shifts in the development, and expression of identity.

3.2 Scripts

Over recent decades the notion of a *script* is being closely related to the concept of a *rule*, in both an historical and a conceptual sense. Theories concerning *rules* and *rule-following* were developed within British philosophy during the first half of the twentieth century. During this period, philosophy in Britain can be said to have taken a 'linguistic turn', which was characterised by a focus on the *logical*, the *semantic* and the language aspect of the world, and which advocated a method of analysing sentences to better understand the influence behind the meaning. This philosophical tendency developed in isolation from and often in opposition to the phenomenological and existential approaches being articulated by Heidegger et al. It drew more heavily on the empirical philosophers of the Scottish Enlightenment (e.g. Hume) rather than the more dialectical approaches of the Continental Enlightenment philosophers (e.g. Kant, on Hegel) and was epitomized in the Cambridge school of Bertrand Russell, Karl Popper and Ludwig Wittgenstein during the early to mid twentieth century. This tradition within philosophy is often termed 'analytic', whereas its cousin on the Continent during the same period is designated 'continental', although many have questioned the firmness and usefulness of this distinction.

Wittgenstein (1953) premised the idea of *rule-following* on the fact that people do have a shared understanding of a common social world. This definition has been drawn on by many theorists since, for some, it has helped to understand people' s relationships to various kinds of technology as being characterised by rule-following behaviour in some of the more contemporary philosophers of technology whose work this thesis explores.

Thus, if rules function relative to particular social situations, then *rule-following* must be given a proper *social* basis. Also rules should be *relativized* to different social groups, cultures or communities; but also rules can function *homogenously* across social groups, cultures and communities. While there is not an objective rule on the one hand and various subjective interpretations of that rule on the other. Rather, because the rules are inherently social entities, a rule is 'subjectively' interpreted *within a community of rule-followers* is just what that rule

'objectively' is. This means that there can *ipso facto* be no individuals in isolation deciding on the 'correct interpretation' for themselves. Rather, rules are 'fixed' by the establishment of consensus across individuals in society. Finally, rule-following does not often require conscious reflection and the formulation of an intention to act in a particular way; it is implicit or learned behaviour that structures the way in which we approach and act in situations, or that reflects an underlying consensus in principles or values that need not be explicitly confirmed.

However, when these general rules are communicated through a specific material form, which is to say that they are *embodied* in some concrete *thing* or *object*, for example, speed bump, it can be said that in this case these material expressions of rules take the form of scripts (Akrich 1992, Latour 1992, Van den Berg 2008). Scripts, therefore can be understood as the expressions of rules in everyday environments. Thus, when placed in a given situation, people do not necessarily have to follow the scripts embedded there. Adderio shows in his paper 'Artifacts at the center of routines' (2010: 20), that from Wittgenstein's work can be drawn that (technology-embedded) rules and classifications are never deterministic but always interpreted. For Wittgenstein the irreducible interpretive flexibility of rules is resulting in the fact that: ".. no course of action could be determined by a rule, because every course of action can be made out to accord with the rule" (Wittgenstein 1967:81).This leads Taylor to the following interpretation: *The rule is, at any given time, what the practice has made it* (Taylor 1993:57-8 *emphasis in original*). In this view, properties embedded inside artifacts are never predetermined but rather ―the capacity to modify the ―rule that is drawn on in any action is an ever present possibility. (Cassell 1993:13 in Orlikowski 2000: 411). Thus, scripts embedded in technologies can be understood as a source of *constraint* and *enabler* in rule-following, as Latour frames it:

> "no aspect of [a situation] […] 'determines' what you are going to say [or do]. […] But just because some material element of the place does not 'determine' an action doesn't mean you can conclude that they do nothing." (Latour, 2005: 195)

Hildebrandt (2008) suggests, that scripts can function or implicit or explicit ways, working directly or indirectly in particular situations. There are also significantly *social* and *cultural types* of script. This reflects the role of *social convention* in governing what is acceptable or otherwise in different situations, and the *cultural variations* that can be seen in these social conventions that reflect different *cultural norms*. In this way, a range of legal, social, cultural, physical and other types of scripts tend to be governing any one situation at any one time. This reflects the *complexity* of social life is in contemporary society.

In important respects, the conception of scripts defended by this thesis resembles Foucault's analysis of the role of architectural features and social regulations in conditioning behaviours and ideas. Foucault's later work (1998) is primarily concerned with the implicit ways that social regulations can function in a society, and how this embodies social power and regulatory forces. Part of Foucault's *political* project is to analyze how people's behaviour is shaped or even controlled in different ways, and yet how, because these ways are implicit, it is more difficult to notice and hence challenge the underlying rules. For Foucault, social regulations become *naturalised*, they become seen as just how a particular situation 'is'. Importantly, Foucault does not focus on the physical or architectural features in an environment in isolation as being 'guilty' of doing the work of social regulation. Rather, he is concerned to show, that at some level a *decision* has been taken by a social power to *use* those features in a way that tacitly enforces rules of social regulation. In only a very general sense, it becomes possible to relate the Foucauldian project of unmasking the hidden mechanisms of social power with the Heideggerian project of becoming aware of modern technologies *qua* one of many types of mediation. Just as for Heidegger technology *mediates* people's relationship with the world and shapes *Dasein*, for Foucault, the way that social spaces function and are governed beget particular values, vested interests and principles. It should be remembered that the overarching point is that features of the social environment could always encourage different forms of social regulation or indeed, more liberated social interaction, not that we should abolish all kinds of architectural feature.

Similarly to Heidegger, for Foucault there exists no place for a human sphere which is not yet affected by the technology. In his book *Discipline and Punish* (1977) Foucault states that the human subject is fundamentally marked by disciplinary power.

> The man described for us, whom we are invited to free, is already in himself the effect of a subjection much more profound than himself. (**…**) The soul is the effect and instrument of a political anatomy; the soul is the prison of the body. (Foucault 1977: 30)

As Dorrestijn (2011) states, for Foucault, the effect of governing and influencing people clearly has become embedded into the material and procedural layout of disciplinary institutions. Foucault provides an example concerning the training of writing at school;

> (**…**) the part of the left arm from the elbow must be placed on the table. The right arm must be at a distance from the body of about three fingers and about three fingers from the table, on which it must rest lightly. The teacher will place the pupils in the posture that they should maintain when writing, and will correct it either by sign or otherwise, when they change this position. (Foucault 2000: 152)

Another example of Foucault concerns the training of shooting in the military:

> Bring the weapon forward. In three stages. Raise the rifle with the right hand, bringing it closer to the body so as to hold it perpendicular with the right knee, the end of the barrel at eye level, grasping it by striking it with the right hand, the arm held close to the body at waist height. At the second stage, bring the rifle in front of you with the left hand (**…**). (Foucault 2000: 153)

Moreover, Foucault points out the importance of routines involved in the assembling of the human body and technologies:

> This is an example of what might be called the instrumental coding of the body. It consists of a breakdown of the total gesture into two parallel series: that of the parts of the body to be used (**…**) and that of the parts of the object. (Foucault 2000: 153)

Dorrestijn (2011) argues, that for Foucault these hybrid relationships of humans and arrangements of power structure our mode of existence. For example, in his influential *The Will to Knowledge* (Foucault, 1998), Foucault analyzes the impact that conditioning elements have had on how the discourse of sexuality has developed as a disciplinary practice in Western society. The following passage could be understood as a 'script-like' analysis of ways of dealing with sexuality in secondary schools:

> Take the secondary schools of the eighteenth century, for example. On the whole, one can have the impression that sex was hardly spoken of at all in these institutions. But one only has to glance over the architectural layout, the rules of discipline, and their whole organization: the question of sex was a constant preoccupation. The builders considered it explicitly. The organizers took it permanently into account. All who held a measure of authority were placed in a state of perpetual alert, which the fixtures, the precautions taken, the interplay of punishments and responsibilities, never ceased to reiterate. The space for classes, the shape of the tables, the planning of the recreation lessons, the distribution of the dormitories (with or without partitions, with or without curtains, the rules for monitoring bedtime and sleep periods – all this referred, in the most prolix manner, to the sexuality of children. (Foucault, 1998:27-28)

Foucault is therefore useful in emphasizing the complex dynamics of political and social power in any modern society that scripts can reflect, either explicitly or implicitly. Certain scripts can *embody* power relations – and could thus be termed *conditioning cues*. The *power relations* that these scripts embody are given force by dynamics in the wider society, which are in turn embodied in scripts. Scripts steer people's behaviour in certain directions. They support the creation of categories such as 'appropriate' versus 'non-appropriate' patterns of behaviour and action. However, as Foucault also shows, such conditioning or disciplining properties are not merely restrictive regulations, but can also enable us to establish agency and subjectivity (Foucault, 1995). In this guise, scripts function as guidelines for the behaviour of people. Scripts in general, therefore – like the rules they materially express - can be said to be both limiting and liberating.

In the next section of this chapter I will look at empirical research concerning how technologies can function as scripts. I will also address the question of whether scripts have a *moral* dimension, which is a noticeable theme in the literature surrounding the function of new technologies in everyday life. This connects to the underlying question of how one can understand the idea of *intimacy* with regards to new technologies.

3.3 Scripts and technologies

A distinct empirical research paradigm on scripts has developed, in Science and Technology Studies (S&TS). The empirical research paradigm serves to highlight and explore in more detail particular aspects of technologies *qua* scripts, concerning how they exist by virtue of the technology *qua* material thing, which is itself a product of distinctly human design. However, in order to capture the myriad roles that scripts can play in everyday life, it is important to recognize that technological objects themselves can also *function as scripts* when they enter our everyday environments. It is therefore important to offer a critical presentation of this empirical research paradigm, to diagnose its strengths but also to point out the shortcomings.

Science and Technology Studies (S&TS) have emerged as a distinct academic and theoretical research discipline alongside the growth and development of science-based or science-related technology within society. As an empirically-minded approach, it is particularly concerned with how it is, or how it can be said, that scripts are 'implanted' or 'embedded' into technologies explicitly or implicitly throughout the process of design.

Researchers have been particularly concerned with researching the ways in which certain assumptions about how the technology will be used become expressed in practice (cf. Akrich, 1992 and 1995; 2002; Latour, 1992; Oudshoorn and Pinch, 2003; Oudshoorn, et al., 2004; Van Oost, 2003). Akrich instigated this line of research by introducing the term *script*:

http://playstudies.wordpress.com/?s=latour

> Designers…define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of 'inscribing' this vision (of prediction about) the world in the technical content of a new object. I will call the end product of this work a 'script' or a 'scenario'. (Akrich, 1992:208)

For Akrich (1992), designers of technological artifacts are script writers. Their design is also a process of *inscribing* a script into the technology. The idea that technology design is simultaneously a process of inscription has been influential in the relevant literature over the last few decades. It means that when users use the technology for something, then they *de*-scribe or unpack what has previously been inscribed into it. This could further be seen to imply that technologies *qua* scripts determine the actions of their users.

Akrich (1992: 208) further noted that, "like a script, technical objects define a framework of action together with that actors and the space in which they are supposed to act". Akrich's aim is to emphasize that, "technical objects participate in building heterogeneous networks that bring together actants of all types and sizes, whether human or non-human" (Akrich, 1992: 206).

In a similar view, for Latour, the design of a certain technological artifact also 'prescribes who does what and when' after the manner of a film script (Latour, 1992).

> Technologies, as it were, can implicitly supply their own user's manuals. They co-shape the use that is made of them; they define actors and relations between actors, and share responsibilities and competencies between humans and things (Latour, 1992: 221)

Another central concern of Latour's (1992) explication of the concept of *script* in the context of modern technologies is to premise the *moral* significance of technical objects in particular sites of social praxis. This is to say that when designers inscribe technologies *qua* scripts, this is at the same time a process of inscribing moral precepts into those technologies. Forced by the instruction of his car to fasten his seat belt, Latour asks:

> Where is the morality? In me, a human driver, dominated by the mindless power of an artifact? Or in the artifact forcing me, a mindless human, to obey the law that I freely accepted when I get my driver's license? Of course, I could have put on my seat belt before the light flashed and the alarm sounded, incorporating in my own self the good behavior that everyone—the car, the law, the police—expected of me. Or else, some devious engineer could have linked the engine ignition to an electric sensor in the seat belt, so that I could not even have started the car before having put on. Where would the morality be in those two extreme cases? In the electric currents flowing in the machine between the switch and the sensor? Or in the electric currents flowing down my spine in the automatism of my routinized behavior? (Latour 1992: 225)

For Latour morality is embedded in the network of relations between different kinds of actants, these actants can be both human and nonhuman – for him, moral agency is sociomaterially constituted. "Morality is no more human than technology, in the sense that it would originate from an already constituted human who would be master of itself as well as of the universe...Morality and technology are ontological categories ...and the human comes out of these modes, it is not at their origin. " (Latour, 2002: 254). The process of inscribing the network he calls 'a program of action'. "Latour attributes programs of actions to all entities -- human and nonhuman. When an entity enters a relationship with another entity, the original programs of action of both are translated into a new one" (Verbeek, 2006: 11).

> The program of action "IF a car is moving, THEN the driver has a seat belt" is enforced. It has become logically—no, it has become sociologically—impossible to drive without wearing the belt. I cannot be bad anymore. I, plus the car, plus the dozens of patented engineers, plus the police are making me be moral. (Latour 1992: 226)

Morality, for Latour, is therefore not only a human domain. Latour states:

> Prescription is the moral and ethical dimension of mechanisms. In spite of the constant weeping of moralists, no human is as relentlessly moral as a machine, especially if it is (she is, he is, they are) as ‘‘user friendly’’ as my Macintosh computer. We have been able to delegate to nonhumans not only force as we have known it for centuries but also values, duties, and ethics. It is because of this morality that we, humans, behave so ethically, no matter how weak and wicked we feel we are. The sum of morality does not only remain stable but increases enormously with the population of nonhumans. It is at this time, funnily enough, that moralists who focus on isolated socialized humans despair of us—us meaning of course humans and their retinue of nonhumans. (Latour, 1992: 232)

The significance of this expanded understanding of *moral behaviour* is that it radically challenges the classic philosophical conception that holds it is only people *qua* autonomous actors who are capable of moral action, or in any significant way governed by moral categories. This is one important aspect of the various post-phenomenological paradigms which seek to offer more developed frameworks for understanding contemporary human-technology relationships.

In order to connect Latour's (1992) understanding of the mediating role of artifacts with the post-phenomenological perspective articulated in Chapter 2, it is important to understand the context in which this understanding develops. One of the central concerns of Latour's work in general is the attempt to overcome what he considers the fundamental difference, deeply ingrained in modern philosophy, between *subject* and *object*. This dichotomy tends to be understood as a separation between ’humans’ and ‘nonhumans’. Yet Latour objects to the fact that both categories have been treated in radically different ways since the Enlightenment. For Latour, reality cannot be adequately understood if humans and nonhumans are treated ‘asymmetrically’; rather, the two cannot be understood or exist in isolation from each other, but are always bound up with each other in a network of relations.

As Latour posits: “One could just as well imagine a battle with the naked bodies of the warriors on the one side, and a heap of armours and weapons on the other” (Latour 1997: 77). He goes on to explain:

> “(…) [T]he human, as we now understand, cannot be grasped and saved unless that other part of itself, the share of things, is restored to it. So long as humanism is constructed through contrast with the object (…) neither the human nor the nonhuman can be understood” (Latour 1993, 136)

Only by virtue of this network are they what they are, and do what they do. Any theoretical perspective that implicitly or explicitly supports an *a priori* dichotomy between the human and non-human rejects this mutual involvement and is therefore incapable of explaining the more complex aspects of the technological mediation of moral decision-making. In a key passage of his book *Aramis, or the Love of Technology* (1996), Latour puts it like this:

> "Anthropomorphism purports to establish a list of the capabilities that define humans and that it can then project through metaphors onto other beings - whales, gorillas, robots, a Macintosh, an Aramis, chips or bugs. The word anthropomorphism always implies that such a projection remains inappropriate, as if it were clear to everyone that the actants on which feelings are projected were actually acting in terms of different competences. If we say that whales are ‘touching’, that a gorilla is ‘macho’, that robots are ‘intelligent’, that Macintosh computers are ‘user-friendly’, that Aramis has ‘the right’ to bump [etc.] ... , we are still supposing that ‘in reality’, of course, all this fauna remains brute and completely devoid of human feelings. Now, how could one describe what they are truly are, independently of any ‘projection’? By using another list taken from a different repertory that is projected surreptitiously onto the actants? For example, technomorphisms: the whale is an ‘automaton’, a simple ‘animal-machine’; the robot, too, is merely a simple machine. Man [*sic*] himself, after all, far from having feelings to project, is only a biochemical automaton.

> We give the impression, then, not that there are two lists, one of human capabilities and one of mechanical competencies, but that legitimate reductionism has taken place of inappropriate anthropomorphism. Underneath projections of feeling, in this view, there is matter. ...
>
> But what can be said of the following projection: 'The chips are bugged'? Here is a zoomorphism - bugs - projected onto a technology. Or this one: 'The gorilla is obeying a simple stimulus-response'? Here a technobiologism - the creation of neurologists - is reprojected on to an animal. ...
>
> ... Let us [therefore] say that ... there is never any projection onto real behaviour, the capabilities to be distributed form an open and potentially infinite list, and that is better to speak of *(x)-morphism* instead of becoming indignant when humans are treated as nonhumans or *vice versa*. The human form is as unknown to us as the nonhuman" (Latour, 1996: 225-227).

Ihde can also be seen to 'expand' this role of artifacts in the relationship between humans and the world, through introducing the idea of the 'intentionality of things':

> Ihde has, from a phenomenological perspective, characterized this mediating role of artifacts in terms of what he calls technological intentionality....By this he means that technologies - like consciousness for Husserl - have a certain directionality, an inclination or trajectory that shapes the way in which they are used. (Verbeek 2005:114)

In a similar way to Latour (1992), articulating a more developed account of the relationship between people and the world through objects involves re-articulating the concept of *mediation* in significant - and perhaps radical - ways. As Latour brings the *mediating* role of technology under the category of the moral, Don Ihde brings it under the concept of intentionality. For both theorists, it is not simply one term of this mediating relationship – the person, or user – who is attributed morality or intentionality – but also the other side involved, the technological artifact, which can now in some way

be said to exemplify morality or intentionality. This, in turn, is due to its developed functional role in everyday life, the more complex *mediation* afforded by new technology *qua* scriptural force in the contemporary world. As Verbeek notes, intentions "are no fixed properties of artifacts" (Verbeek, 2006:5); they only arise in relationships of mediation with people. Verbeek stresses:

> Scripts transcend functionality: they form a surplus to it, which occurs once the technology is functioning. When technologies fulfill their functions, they also help to shape the actions of their users. (Verbeek, 2006a: 362)

It is possible to acknowledge here a further expression of the fundamentally *social* function or meaning of scripts in everyday environments. Scripts 'transcend functionality' in the sense that they can function in ways beyond those intended by their designers. This is because the script itself is a *social* construct, open to interpretation and contestation. Scripts also 'transcend functionality' - in the sense of significantly shaping the actions and experiences of their users in salient ways.

The concept of script thus allows for the development of a framework for understanding how technological artifacts *shape* human behaviour. There is a limitation to which Verbeek (2006a) refers: for Akrich and Latour, scripts seem to predetermine what the users of the technologies should or should not do. But technologies do not function only for the goals they were designed for:

> Designers help to shape the mediating roles of technologies, but these roles also depend on the ways in which the technologies are used and on the ways in which the technologies in question allow unforeseen mediations to emerge. The suggestion that 'scripts' are a result of inscriptions (Akrich) or 'delegations' (Latour) therefore, does not do enough justice to the complex way in which mediation comes about. Designers cannot simply 'inscribe' a desired role of morality into an artifact. The mediating role of technologies is not only the result of the activities of the designers, who inscribe scripts or delegate responsibilities, but also depends on the users, who interpret and appropriate technologies, and on the technologies themselves, which can evoke 'emergent' forms of mediation. (Verbeek 2006: 371-372)

Technological mediation does much more than designers might ‘inscribe’ into the particular technologies they design. It is also important to question what it means to ‘inscribe’ a particular script ‘into’ a technology outside of it being used in a particular situation. A better description might be that designers have a specific *use* in mind when they design a particular technology. This is an equally commonsense notion of what it means to design something: to fulfil a brief, or make a thing that will perform a particular function for a group of users. As will be seen later, there is also something significant about the *physical* qualities of the object that allow it to do its work *qua* script. This is why it is important to highlight that scripts are *material* expressions, as opposed to the sort of abstract principles we might find written down in rule- books. For Verbeek, it is also because these technologies are inherently moral entities. Verbeek argues that technological artifacts have in some sense moral agency. He argues that as long as ethics is "about the question how to act" technological artifacts do *prescribe* certain moral behaviours, albeit in an ‘implicit’ way.

By taking a very broad definition of ‘ethics’ as ‘how to act’, we can see that *anything* that influences how we might act becomes categorised as somehow ‘ethical’. For example, following this definition, it might seem to follow that oxygen is in some sense ‘moral’, since without it, I would not be able to breathe at all. We should be careful to not uncritically follow this overly broad definition of ethics suggested by Verbeek. It follows from this definition that designers are "doing ‘ethics by other means': they materialize morality". Technologies act "in the sense that they help to shape human actions and experiences" (Verbeek: 2005). However, and again, we can notice the range of possible consequences of anything that ‘helps to shape human actions’ being categorised as ‘moral’: why not the bird that wakes me up in the morning, or the Sun that allows me to see during the day and hence helps ‘shape’ my visual perception? As we will go onto explore in subsequent chapters, we must be more clear about what it is *specifically* that technology brings to shaping human experience and actions that sets it apart from everyday things like oxygen, the Sun and so on.

One *prima facie* criticism of this understanding is that whilst Verbeek (2006) stresses the *social function* that artifacts *qua* scriptal forces play as a way of avoiding charges of technological determinism, he also claims it is specifically the artifact's designers who are 'doing ethics' by creating these technologies. However, it must be ultimately the wider society that imbues them with any *moral* quality they may have in a situation. The difficulty is a lack of any specification concerning the way that particular technologies function in particular situations, whether they express a national law or a cultural expectation for example, if their use becomes widespread or dominates a particular environment, and whether we feel they happen to reflect an ethic we agree with, or that they don't, and whether we feel they are 'imposed' on us rather than actively chosen or in general agreed with. A wider *social* perspective must be taken to make sense of such issues, which focuses on the function of objects not in isolation, or as constrained by design, but as actual function in everyday life.

It does not follow however, that technologies have the *autonomy* to act in their own. Artifacts cannot 'act' or work without the intentionality or actions of people, which is to say that technologies are products of typically *human* ingenuity, whilst also functioning in profoundly *human* settings. When artifacts are said to have the potential or capacity to materialize morality, this means that they 'co-shape' the moral decisions humans make in some way. However, it is not obvious that Verbeek manages to properly demarcate what it means to 'co-shape' a decision; indeed, if every item and feature helps us to 'co-shape' a moral decision, it would seem that something distinctive and special about morality gets lost. Everything is moral so nothing is. For example, medical technologies have the capacities to identify that an foetus has a deadly disease. On the basis of this technological mediation, as Verbeek (2006) notes, a decision for an abortion cannot be understood as neither 'purely' human as much as it might not be 'entirely induced' by the technology used.

The obvious problem is the common sense objection that it is not solely the basis of technological mediation in isolation, or the technology *per se*, that doctors suggest abortion as a course of action. It is because of the moral or ethical status *already* given by

society to unborn children with deadly diseases. Further, the *actual* decision here is taken by human beings, and it is human beings who have decided that having a deadly disease is a suitable reason for aborting an unborn child. In order for the conclusion that artifacts materialize morality to carry through, Verbeek must explain why the decision to abort is 'induced' by the medical technology in some significant way that it could not also be said to be 'induced' by the fact the foetus has a deadly disease. Otherwise, his account would seem to undermine itself: it claims both that technology is given meaning and moral status or intentionality by virtue of its social role alone, and also that technology, by virtue of its design, contributes some special moral quality or other. Materializing morality means that technological artifacts 'materialize' or 'embody' the ethical precepts of the designers, producers or the society in which the artifacts are produced. This echoes Akrich's (1992) idea that designers 'inhere' scripts into technologies. This definition could be said to resolve the above problem, since the ethical precepts can belong to *either* the designers *or* to the wider society. However, we must still offer some account of how such precepts *function* in a social environment. It would be more accurate to say that ethical precepts are not limited to discourses or spoken and written maxims, but can simply take a material form via technological artifacts.

Verbeek (2006) also argues that designers of a technology can only do something limited, because technological artifacts are defined not only by their designers but also by the users. This is one way of acknowledging that the specific meaning of a technology in any one situation is a product of its *social function,* which is determined neither by its designer or by its user in isolation. From this premise, we can further begin to appreciate how the use contexts of artifacts can be said to define those artifacts' identity:

> Only when human beings use them, artifacts become artifacts for doing something. And this "for doing something" is determined not entirely by the properties of the artifact itself but also by the ways users deal with them... (Verbeek, 2006: 371)

Here, it is important to appreciate the difference between what a designer intends or has as a brief, and how what the product of this design actually *functions in situ*. Although the

properties of any object naturally constrain its use, they do not fully determine that use. In this regard, technologies can be used in unanticipated ways. Verbeek (2006) notes that even if technologies are used in ways intended by their designers, they may also mediate unforeseen things: the design of revolving doors prohibiting people who use wheelchairs was a form of mediation unanticipated by the designers. This observation should be understood in general an argument for constantly improving the design of technology to suit people's needs.

According to Verbeek (2006), the limitation of Akrich's (1992) notion of script and Latour's (1992) concept of delegation do not account for the 'complex way in which mediation comes about'. It is significant that Verbeek not only finds the classical explication of technological mediation inadequate, but also the theories of his near contemporaries, and notes:

> Designers cannot simply inscribe a desired form of morality into an artifact. The mediating role of technologies is not the result of the activities of the designers, who inscribe scripts or delegate responsibilities, but also depends on the users, who interpret and appropriate technologies, and on the technologies themselves, which can evoke emergent forms of mediation. (Verbeek 2006: 372)

The delicate balance between the role of the designer and the role of the user in fixing the *specific use* of the technology in any one particular situation should be appreciated. Verbeek (2006) has a tendency to blur this relationship, such that sometimes it seems designers do 'imbue' technology with morality, and other times that they do not. In fact, there are two possible methods that designers can use to 'make' morality 'a part of' the technologies themselves. The first is to help designers reflect the possible aftermath that artifacts may bring about and hence help them to find ways to stop or minimize the unwanted results of the artifacts. The second is to let designers embody "specific forms of mediation" in the artifacts (Verbeek 2006: 369).

Verbeek (2006: 396) stresses that as long as the question "how to act? " is the central ethical question, and insofar as technologies can answer this question, then we can say that things can have morality like people. We could criticise Verbeek here for seeming to sometimes confuse the technology *per se* or in isolation, with the particular role it is able to play in specific situations given prevailing moral and ethical meanings. We have further questioned the validity of Verbeek's reasoning that because technologies 'co-shape human behaviour' that they are properly understood as 'being moral' in the same way as people. One obvious example would come from classic moral theory, which takes both consciousness, moral awareness and auntonomy as necessary conditions for moral action. Yet technologies have neither consciousness, or moral awareness, or autonomy in anything like the way that people do. Nevertheless, Verbeek argues, the capacity of the artifacts to meet the issue at hand might not be sufficient condition to ascribe morality to things:

> Things, after all, do not have intentions. They are not able to make decisions about their influence on human actions, and therefore they cannot be held responsible for their "actions." On the basis of this argument, it would be a mistake to describe the influence of things as human actions in terms of morality. Steering behaviour, as well as showing steered behaviour, is something entirely different than making moral decisions. (Verbeek 2006:119)

Verbeek (2006) argues that things having morality does not mean that they bear responsibility for their actions. This is because it must be the designer or the producer that takes the accountability. The problem here, as has been noted, is that Verbeek (2006) wants to downplay the role of the designer to avoid charges of technological determinism. Yet it would seem wrong to hold the designer of a gun responsible, for instance, for a third party using it to kill somebody. It also could be argued that technology 'having morality' without also 'having moral responsibility for its actions' is a contradiction in terms, since being a moral agent is *ipso facto* to take responsibility for one's actions. Verbeek (2006) also argues that since artifacts do answer moral questions, they should be taken as moral agents. For Verbeek things are moral agents because they "help to shape morality" (Verbeek 2006:121). This leaves an open question concerning

whether we accept Verbeek's (2006) stronger account that infers from this that technologies can 'have' morality. Nevertheless, we can appreciate the insight that technologies do play some role in moral decision-making, and also mediate and in some senses make possible people's actions that we might want to designate as 'moral'.

3.4 Scripts vs. technological intentionalities

It has now been established that a distinct empirical research paradigm concerning scripts has emerged over recent decades that also focused on the morality of technological artifacts. However, the central criticism of the approach concerns the fact that it has arisen with specific practical aims in mind, and hence does not constitute systematic investigations into the many different ways that, technologies *qua* scripts function in concrete practices of use. As a consequence, the approach critically examines one of its underlying assumptions, that technologies somehow 'contain' scripts, which are 'embedded' into technologies or which 'inhere' within them. This would seem to suggest a worrying absolute sort of 'dualism' concerning technologies and the scripts they can materially express; whereas it has been seen throughout this thesis that it is not as easy to distinguish the *materiality* of the technology from the script it *materially* embodies on the one hand, whereas scripts also have a fundamentally *social* aspect on the other.
Script analysis focuses on how *humans* affect the behaviour of other humans, *via objects*, that is, on ways in which designers, embedding their scripts regarding users and use into an artifact, affect the behaviours and self-conceptions of these users[13]. This fails to grasp that, technologies *as artifacts* may act as scriptural forces themselves in everyday life. Hence, it is necessary to both examine and explain what happens once technological artifacts enter our everyday environments, and to articulate how technologies shape the

[13] This idea is put forth most clearly in Latour's description of a script in *Reassembling the social: An introduction to Actor-Network Theory* (Latour, 2005). In this book he gives an example of how an architect designs a lecture hall, in which objects and spatial arrangements 'script' the lecturing scenes that are to take place there. He refers to the fact that the architect envisions that "*you* [as the teacher] *will have to be heard when you speak; you will sit at the podium; you will face a number of students whose maximum number, space requirements, etc. must be taken into consideration.* […] *...when you enter this scene, you feel that* […] *most of what you need to act is already* in place." (Latour, 2005: 195, emphasis in the original). It is the *architect*, then, who creates the scripts and thus 'molds' the behaviours of individuals in a space through the design and placement of objects.

'cues' we use in our practical spaces. The beginning of such an investigation can be found in the work of Ihde.

Drawing on the previous section and the discussion of scripts *qua* mediators, it is possible to draw out in more detail the discussion concerning scripts and intentionalities. It was established in Chapter 2 that the philosopher of technology Ihde develops an influential typography for articulating the different types of *mediating relationship* that obtain between people and technologies in contemporary life, and which makes good on what was described as the 'own weight' of technological artifacts, or what they bring to that relation of mediation. It was further argued that Ihde allows the theoretical understanding of *mediation* relating to technologies to move beyond the existing literature on this topic in a number of ways, significantly regarding the myriad roles that technology can play in everyday life and in the private sphere. It was also a consequence of Ihde's location within the broader literature that shapes his approach as broadly phenomenologist in character, as, *pace* Heidegger, it comes from the assumption of the shared interrelatedness of people and the social world. This captures the insight that technologies become socially meaningful only through the interpretation and uses of human beings in concrete practices of use. One further way of developing this thought is to bring out the *inherently relational* character of technology, that it is always 'in relation to….'. This is to say that technology can only be used relative to some user or other. This has interesting consequences for the broader focus of this thesis.

It can be said that the specific role, or relation of mediation, that obtains between a user and a technology 'fixes' the identity of both terms in the relationship. In this way, technology *mediates* people's relationship to the shared social world. However, that relationship of mediation gives rise to two other second order mediations: first a mediation of identity on the part of the user; second, a relation of mediation on the part of the identity of the technology. The first identity mediation is naturally more complex, and is turned to in the later parts of the thesis. The second identity mediation – that of the technology – is more straightforward. This describes the way in which the specific identity of the technology becomes 'fixed' so soon as it begins to function relative to a

user, as a technology 'to….'. The specific identity of the technology is just what that technology 'is' in the context of use. The fact that it is relative to one person and not another, or relative to one context or time, rather than a different context or time, allows it to take on its specific character in that specific site of social praxis. Again, this draws out the way in which technologies are always used in some concrete practice of use or other. The things that 'fix' one particular context – user, time, context, social and cultural norms – become captured by the 'relative to….' part of the expression of the relationship between the user and the technology. A further important factor constraining the possible identities of the technology, or possible range of things it can enter into relationships with 'relative to…' is the materiality of the technological object itself. Again, the example of the hammer not being able to achieve brain surgery is indicative: the hammer cannot be used 'relative to brain-surgeon-for-brain-surgery' and hence cannot take on that specific social role or function and hence identity. It has already been established that this discriminating power of technology is a benign and consequence of design and use for specific ends.

With this established, it is possible to draw out an interesting social and cultural history of the different identities that different technologies have taken on in different contexts, often in different historical periods. This allows for capturing in more detail the way in which technologies play specific functions in society in concrete practices of use. It also explains how what a technology 'is' – the specific identity it 'takes on' - can sometimes diverge from what that technology is supposed to be, or was designed to be. However, the emergence of *new scripts* can have more profound consequences *for the identity of the technology.* This draws out the way in which the mediating relationship between user and technology also gives rise to a second-order mediation of identity for the technology. A familiar and interesting example concerns the telephone. The telephone was first designed with the aim of helping them who hardly are able to hear. This is the role it initially played in society, relative to the hearing-impaired, and hence was the identity it took on within society. However, the telephone then began to be used relative to a much broader group of people. It began to be used by different users, for different aims, for example, for communication more broadly. Because of a shifted 'relationship to….,' the

telephone developed a much wider sense of identity within society, becoming a communication medium at large. Moreover, this was a consequence of a changed concrete practice of concrete use of the material object: rather than being in a relation to the hearing-impaired, the telephone entered into a relation to people more generally in society. Rather than being used in relation to the hearing impaired as a hearing aid, it became used in relation to people more generally in society as a medium of everyday communication. The telephone's identity as a second order mediation of the relation of mediation between users and the world is thus a function of its relation in concrete practices of use.

Hence, it can be seen that the telephone has no a-historical or trans-societal 'essence' in and of itself; rather, its identity is a function of the relations of mediation it enters into with various users. This is to say that the technology is *multistable*: it is fundamentally dependent on the concrete context in which it enters into a mediating relationship with some person or other. Further, "once technologies have received a (relative) identity," according to lhde, "*within that relation* they nevertheless can have an own weight" (Ihde, 1990). This could be interpreted to refer to the way in which identities are nevertheless constrained by the materiality of the technology itself. This is what the technology 'brings to' the mediating relation in its own right, how it constrains certain uses, making some impossible whilst inviting others, and hence how it helps to shape its own identity through entering into a relation of mediation with a user. This describes how it does matter which particular technologies are used in different types of relations. The idea of *multistability* thus captures that the 'own weight' of the artifact is lodged in the fact of the artifact's materiality, that it is a product of human design, and further, a material object.

However, for Ihde there are further implications of *multistability,* namely that this implies that technologies are not 'neutral' intermediaries, which is to say that they bring a *technological intentionality* to the relationships they enter into with users. This latter concept describes how the technology shapes the mediating relationship in its own way. It can then be seen that both users and technologies *co-shape* the relationships of

mediation that they enter into, and hence, that both can be said to *co-shape* the identities that arise out of this relationship.

As a further illustration, Ihde considers the shift from writing with a pen to a typewriter and to a word processor. Historically, writing with a pen meant writing relatively slowly, whereas the typewriter and then the word processor gave rise to faster writing speeds and more automation of particular stylistic functions. This reflects the way in which there are material constraints on how any one technology can be used in practice. In turn, this means that there are material constraints on the range of possible identities that any one technology can take on. This explains, in turn, why newer technologies are continually being developed, and why, in general, it could be said that this is a social good. This illustration shows how it is that technologies do not determine but rather could be said to *facilitate an inclination* to use them in certain kinds of ways.

In turn, this has important consequences for how we conceptualize the human-technology relationship. It has already been seen that, for Ihde, technologies bring an 'own weight' to relationships of mediation. This means that both that relationship of mediation and the two second order mediations of identity in the two respective terms of that relationship – person and technology – to which it gives rise, cannot be understood through solely examining the 'human side' of the initial relationship. Rather, the 'technological side' is important, too. A good way of capturing this 'side of the technology' for Ihde is by the concept of *technological intentionality*. Used in a very broad sense, this refers to how the technology is able to co-shape the mediated character of the relationships it enters into. In turn, this means going beyond reducing various technologies simply to 'signs' or 'intentions of designers'.

However, as I mentioned in Chapter 2, the term is used in a broad sense to mean a 'directedness at the world'. Because technologies are explicitly designed by designers for specific functions *in the world* then it makes sense to say that they are directed *at the world*. In this sense, *technological intentionality* is logically and metaphysically dependent on the intentions of firstly, the designers of the technology, and secondly, the

intentions of the user in every new content of use. Hence, this is a *specific form* of intentionality that is attributed to artifacts. It is important to establish that technological intentionality arises in particular practices of use. In turn, analyzing technology in terms of *mediation* makes it possible to understand in greater detail how technologies allow us to perform a large range of actions and tasks in the world, but also how technologies shape the way that we approach and experience that world.

3.5 Conclusion

So far in this chapter, I have demonstrated that objects have always had an influence on people: from ditches that make areas inaccessible to speed bumps that make motorists slow down when it is safer to do so. However, ambient intelligence and persuasive technology aim to enable a much more subtle, far-reaching form of influence. AmI technologies can be said to create situations or contexts for human beings which are characterized by a significant supplementing of specific human judgments, tasks or actions, in specific ways and for specific ends. This could be further characterized as a supplanting of such specific human qualities with the 'external' algorithmic standards and norms that replace them in the form of AmI (Greenfield, 2006). By offering AmI technologies for specific tasks in the lived environment those tasks quickly become outsourced from the users to the technology and affect the decisions of the users involved. However, it is also possible to understand the relationship between AmI and people not as an outsourcing, but as an amputating of human decision-making and judgement (McLuhan, 1964). Through the regular use of AmI technologies this dependence only tends to become recognized when the AmI in question malfunctions (McLuhan, 1964). This dependency could also cause a negative impact on both the individual, and their relationship with society, characterized by a kind of 'numbness' (McLuhan, 1964). However, this fails to notice the way in which particular human tasks and judgements are outsourced to AmI technologies in order to extend those human abilities, and to extend them into something that was not present or possible before the AmI.

In summary, a number of key premises have been established throughout this chapter. It has been suggested that scripts can be understood *qua* mediators, and that structuring action or behaviour are specific types of mediations that technologies *qua* scripts are able to give rise to. It has also been established that scripts are necessarily interpreted by people and hence have a range of possible interpretations in concrete practices of use, yet that these possible interpretations are further constrained by the materiality of the objects themselves. The concept of *user script* was introduced to capture how new scripts can arise in practices of use. This led to a discussion of how technologies bring their 'own weight' to relations of mediation. It was seen that out of the basic relationship of mediation between people and the world effected by technologies that two other second order relationships of mediation arise. This involves the 'fixing' of the two terms in the relationship – people and technologies – and the first is more complex than the second. Technologies thus become always 'relative to…' some context and user or other. Hence, their specific identity becomes a second-order mediation of the basic mediating relationship; likewise, the thesis will go on to explore how technologies mediate human identities. Finally, the concept of *technological intentionality* has been introduced, to mean a 'directedness at the world' to further articulate the 'own weight' *qua* material things that technological objects bring to the various relations of mediation that they enter into. Overall, the chapter has also asserted the fundamental relatedness of people, technologies and the shared *lifeworld* and also established that technologies can constitute a significant *upgrade of our practical space*.

As Kiran (2009) points out, as is through technological actions that *the self* becomes co-constituted, transformed, and hence those technologies become fundamental to how we relate to both the world and ourselves. Our actions are always relational, our way of being in the world necessarily involves a condition of *relating* ourselves *to* these objects – we can feel attached to these objects.

Chapter 4: Intimate Technologies - Relationships with Technological Objects

> "An Empathy Box", he said, stammering in his excitement, "is the most personal possession you have. It's an extension of your body; it's the way you touch other humans, it's the way you stop being alone."
>
> Philip K. Dick (1964) *Do Androids dream of Electric Sheep?*

4.1 Introduction

This is the more 'empirical' chapter of the thesis, which draws on relevant studies to establish and develop (TO2), to analyze personal identity construction in relationship to ambient intelligence and persuasive technologies from various relevant theoretical or philosophical perspectives, with the aim of sketching a meaningful philosophical framework that is relevant to intelligent technologies in particular. This chapter thus relates to the trajectory of the argument of the thesis as an elongated case study, in particular drawing out the argument's concern with *intimacy* between smart technologies and their users and explaining its relevance in substantiating the main claim (CO1) that smart technologies fundamentally challenge our traditional understandings of the division between people and things, and hence to lay the foundations for a proper investigation into both (C2) and the more practical considerations concerning responsibility and design.

In previous chapters I have established a number of critical premises on which to build a sensitive reading of the relationship between people and new technology. It has been seen firstly that technology *mediates* the relationship between people and their shared social world. The last chapter has examined the way in which technologies can be said to function as *scripts*, which is to say that they are material expressions of wider social norms and principles that take on particular functions in particular environments. This is one significant way in which technologies can be said to *mediate* our shared social experience, both implicitly and explicitly. On a number of occasions, it has been noted that technologies *shape* our experiences of the world in significant ways. But what about our interactions with *technological artifacts themselves* - how can we understand interactions with Ambient Intelligence technologies and other artifacts and objects? How do people *relate* to objects in general and to technological objects in particular? And do such objects also have an impact on our self-conceptions?

In this chapter, I go on to examine in detail a number of examples of particularly close relationships between individuals and various technologies. These characterise what might be generally agreed to be particularly contemporary or modern technologies, and significantly, ones that are designed for individual use. My purpose is to begin to sketch an idea of *intimacy* regarding human-technology relationships in particular. It has therefore been decided to explore particular relationships that people have with objects from a more psychological – rather than a philosophical – perspective, and go on to draw out the implications of this reading relative to salient phenomena in the literature and contemporary world. This chapter in particular seeks to establish, building on the points mentioned above, that something *significant* happens in the relationship between individuals and certain types of technology that goes well beyond the traditional philosophical account of this relationship that sees technologies as alienating and dominating people. Rather, and in line with the previous chapter, the focus is to explore how there is more of an 'active' component of *both* terms of the people-technology relation than has previously been understood.

4.2 Attachment to technological objects

> A child goes forth every day / And the first object he looked upon /
> That object he became.
>
> Whitman Walt, Leaves of Grass, (1881-82)

Attachment is a process closely related to the idea of the *transitional object*, as articulated within the academic field of child psychology, but with important consequences for the philosophy of technology.[14] The process of attachment is a regular part of child development, and allows children to develop a clear sense of their *identity*.

Donald Wood Winnicott (1896-1971), one of the founding fathers of Object Relations Theory, actually discussed how objects mediate between the child's earliest bonds with the mother, who the infant experiences as inseparable from the self. His 1951 essay *Transitional Objects and Transitional Phenomena* had a substantial impact on child psychology.[15] Transitional objects mirror" their own "coming into being" and the child's growing capacity to develop relationships with other people, to be experienced as separate beings. These objects help the child to make the emotional transition from being dependent on its caregivers towards being independent in the world. Transitional objects are actual artifacts, the infant's first 'not-me' possessions, like a blanket or a doll. They are tangible and can be held onto, grasped and hugged. It is through the child's relationship with the object that the child is able to become more 'fully fledged' as a person in the shared social world; hence, it can be acknowledged that the transitional object is one peculiar form of the *mediating* role that objects play in forging and establishing human-world relationships, and of mediating *human subjectivity* more generally.

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[14] Often called 'security objects'.

[15] Winnicott presented this essay at a meeting of the British Psycho-Analytical Society in 1951, but it was not published until 1953.

Winnicott conceptualized the psychic space between mother and infant, as neither wholly psychological nor physical and he termed the 'holding environment' as a place that enables the child to make a transition into autonomy.

> It is in the space between inner and outer world, which is also the space between people--the transitional space--that intimate relationships and creativity occur.
>
> Winnicott D. W. (1951) *Transitional Objects and Transitional Phenomena*

Thus, 'transitional objects' serve important developmental functions, and although they are meant to be lost or left behind, there are numerous examples of their re-emergence in later stages of life. Winnicott claims that the need to confront and accept reality spans a lifetime, only beginning with experience as infants. He writes,

> "[T]he task of reality-acceptance is never completed…[N]o human being is free from the strain of relating inner and outer reality, and…[R]elief from the strain is provided by an intermediate area of experience which is not challenged (art, religion, etc.)." (Winnicott 1971: 18)

Therefore, psychologists came to hold that this process of transitional phenomena continues from childhood to adulthood**.** As Robert Young (1994) explained:

> Having abandoned the blanket, doll or teddy, one can still attach similar significance to other objects with a less addictive intensity. The sensuous, comforting quality and the sense of something that is favorite and to which one turns when in danger of depressive anxiety applies to all sorts of special things. Everyone's list will be different, but these days Walkmans have this quality for many adolescents, as do portable computer games for pre-teens and computers for adult devotees, whether they be merely enthusiastic word processors or

> totally committed "hackers". The same can be said for mountain bikes, fancy roller skates, expensive trainers, certain fashions in clothes – Champion sweatshirts and sweatpants and Timberland shoes in the case of my children. (Young, 1994: 55)[16]

Because of the emotional comfort given by transitional objects, Young claims that "they can become more real and intimate than human relations per se" (Young, 1994). Significantly, Young (1994) is here referring to transitional objects that are used in adult contexts as well as those used by children. Building on this fundamental insight, he further suggests that the relationship between persons and things can become further transformed "so that my best friend is my Walkman or my personal computer".

The computer in particular, as opposed to other types of object *and* other types of technological object, plays a significant role in providing *relationships* for people, based on the computer's *interactive* capabilities:

> One can turn the world of machines for relationship. . . . And the computer, reactive or interactive, offers companionship without the threat of human intimacy. . .The interactivity of the computer may make him feel less alone, even as he spends more and more of his time programming alone. (Turkle 1995)[17]

A relatively new approach towards an understanding of the attachment to interactive technologies is provided by McCarthy and Wright (2004). For them, people's interactions and relations with technology can be characterized by three themes, described as follows (McCarthy and Wright 2008: 4):

[16] Young, Robert. *Mental Space*. London: Process Press. 1994

[17] Turkle, Sherry. *The Second Self: Computers and the Human Spirit.* (1995)

— A holistic approach to experience wherein the intellectual, sensual, and emotional stand as equal partners in experience.
— Continuous engagement and sense-making wherein the self is always already engaged in experience and brings to each situation a history of personal and cultural meanings and anticipated futures that complete the experience through acts of sense-making.
—A relational or dialogical approach wherein self, object, and setting are actively constructed as multiple centers of value with multiple perspectives and voices and where an action, utterance, or thing is designed and produced but can never be finalized since the experience of it is always completed in dialog with those other centers of value.

McCarthy and Wright argue that interactive technologies are destined to offer *enchantment*: "such technologies offer an experience of being caught up and carried away, in which, although we are disoriented, perception and attention are heightened". (McCarthy and Wright 2005: 4)

This understanding of *enchantment* as the source of attachment to computers is closely related to the ideas of John Dewey. Dewey (1934) asserts that, "a person's experience is created through the relationship between a person and the tools she or he uses, which form part of their environment". This has some resonances with the general idea that runs throughout this thesis, that objects *qua* tools mediate not only human-world relationships, but also that they mediate human experience and *subjectivity* itself. Importantly, in the case of *enchantment* in particular, a person is 'caught up with' the tool in a way which can be characterized as *immersive*. This aims to capture in an intuitive sense the way in which people at work can become absorbed in the process of working, in a way where they consider themselves to be 'connected to' or 'a part of' the tool they use. It was seen in earlier chapters in this thesis that this is the experience that gave rise to the intuitive pull of the thesis of *bodily extension*, which was found inadequate as a way of describing the relationships many people have to contemporary technology. However, Dewey (1934) discusses a more general kind of experience that is facilitated by contemporary technology, as a kind of sensual development of the relationship between a person and

their environment, derived from a combination of the senses that familiarize the person with their environment. Dewey describes such an experience as including:

> " [W]hat men do and suffer, what they strive for, love, believe and endure, and also how men act and are acted upon, the ways in which they do and suffer, desire and enjoy, see, believe, imagine—in short, processes of experiencing. . . . It is 'double barrelled' in that it recognizes in its primary integrity no division between act and material, subject and object, but contains them both in an unanalyzed totality." (Dewey 1925: 10, 11)

With resonances to Ihde's exclusive focus on *mediation of perception*, for Dewey it is further a more through *sensory mediation* that is effected when people enter into relationships with technology Dewey (1934) uses as an example a mechanic working on an engine. When the mechanic is absorbed in his work, he sees, hears, smells, and touches the engine, and through these senses he diagnoses what is wrong. Being completely immersed in his work, and focused on the task at hand, the mechanic develops a relationship with the engine. Because of his senses, he is caught up with what we might call the *personality* of the engine. This highlights a number of important features of people's relationship with technology from the perspective *of the technology*, as it were. First, the technology allows for an *immersive* experience; second, this allows for the development of a particularly strong *mediating relationship* with the technology; third, the technology is attributed its *own personality*. This begins to elucidate a framework for understanding the more complex and subtle dynamics of mediating relationships between people and technology in the contemporary world.

The following sections draws out in more detail the important qualities that objects *qua* technologies display, and the way that this allows them to function as mediators in people's everyday lives. It therefore concerns: Don Ihde's human-technology relations, Sherry Turkle's research on 'relational artifacts', and Byron Reeves' and Clifford Nass' 'Media Equation'.

4.2.1 Human-Technology Relations

Don Ihde (1990) examines the specific relations of mediation that arise between people and technology in contemporary society. He proposes a four-way typology based on our phenomenological engagement with technical artifacts. He classifies these as: *Embodiment Relations, Hermeneutic Relations, Alterity Relations and Background Relations*.

In the first type of relations, humans embody the technology which, thus, mediates perception. In these *embodiment relations*, technology is understood as transparent as it becomes an instrumental extension of the body. Embodiment relations occur "in the use of artifacts like glasses, telescopes, bicycles and hammers through which the world is perceived or acted on. They are 'incorporated' into our perceptual apparatus and motor programs, and may even come to feel like they are part of us". (Brey, 2008: 9) Ihde illustrates this human-technology relation in his early philosophy of technology book *Technics and Praxis* (1979):

> I pick up a pencil or a piece of chalk and begin to trace it across the desk or the blackboard. Upon a careful examination of this experience I suddenly discover that I experience the blackboard *through* the chalk – I *feel* the smoothness or the roughness of the board *at the end of the chalk*. (Ihde, 1979, p. 7)

Hermeneutic relations are at play when artifacts mediate our experience of or engagement with the world through "symbolic or pictorial representations of the world and require a 'reading' of the technology" (Albrechtslund, 2008: 21). To illustrate these hermeneutic relations, Ihde mentions a thermometer which measures outside temperature. If one reads 2 ° C, one merely reads a number, but still one hermeneutically knows that it is cold outside. In Ihde's words: "A hermeneutic relation mimics sensory perception insofar as it is also a kind of seeing as .. ; but it is a referential seeing, which has as its immediate perceptual focus seeing the thermometer" (Ihde, 1990: 85). In this example technology is not the object of perception, as the point of interest is the level of

temperature.

The next group Ihde names with reference to Emmanuel Lévinas *alterity relations*. Alterity (alterité) is an important concept in the work of Lévinas, and Ihde understands it as "[T]he radical difference posed to any human by another human, an *other* (and by the ultimately other, God)" (Ihde, 1990, p. 98). The closeness to the other forces me to question my "in itself [*en soi*]" (Levinas 2000: 138) and, in this way, "I am taken hostage by the other, who, in turn awakens me in responsibility for him" (Chonque, 2002: 22). An alterity relation is characterized by standing in relation *to* or *with* technology. Thus, the technical artifact is experienced as a being that is otherwise, for example, when one is confronted with an 'smart object'. Here we "direct our attention to an artifact and this relation may involve attitudes and feelings towards the object, may it be admiration, resentment or love" (Brey, 2000: 9). Chapman explains an alterity relation as follows:

> "Alterity is experienced by users as the feeling that something is both autonomous and in possession of its own free will; when objects embody this eccentric quality, the relationships forged between subject and object are frequently strong and long-lasting." (Chapman, 2005:74)

Alterity relations are then able to ground what it is that some people might feel a 'special bond' with particular technologies. In an alterity relation a person relates to the object 'in itself', the technology takes on the role of a *quasi-other* (Ihde, 1990:98). This kind of relation seems stronger then mere objectness, but weaker then the otherness found with animals or other humans. Ihde argues that we have a wide range of alterity relations with computer technologies. He offers the example of a computer game:

> The quasi otherness and quasi-autonomy of the computer game fascinates us. The more the technology is 'like' us, the more we are fascinated by it and the stronger the alterity relation is. Other media like film, cinema and television are technologies with which we relate and are fascinated by, but there is also a hermeneutic dimensions to it, because they refer in their unique way to a 'world'. They can make present events in the world and the perceptual focus is on the screen.

> We have a wide range of alterity relations with computer technologies, which 'display a quasi-otherness within the limits of linguistics and, more particularly, of logical behaviours' (Ihde, 1990, p. 106).

Again, this captures something special about the kind of phenomenological experience that people have, especially in the contemporary age, of specific kinds of technologies in certain social circumstances of use. The quasi otherness and quasi-autonomy of the technological artifact fascinates us. The more the technology is 'like' us, the more we are fascinated by it and the stronger the alterity relation is (Ihde, 1990). To illustrate the differences between *other* and *quasi-other*, Ihde (1990) draws a distinction between a 'spirited horse' and a 'spirited sports car':

> To ride a spirited horse is to encounter a lively animal *other*. In its pre- or nonhuman context, the horse has a life of its own within the environment that allowed this form of life. Once domesticated, the horse can be "used" as an "instrument" of human praxis – but only to a degree and in a way different from counterpart technologies; in this case, the "spirited" sports car. […] No matter how well trained, no horse displays the same "obedience" as the car. Take malfunction: in the car, a malfunction "resists" my command – I push the accelerator, and because of a clogged gas line, there is not the response I expected. But the animate resistance of a spirited horse is more than such a mechanical lack of response – the response is more than malfunction, it is *dis*obedience […]. (Ihde, 1990, p. 99)

Both – car and horse - seem to have a will and direction of their own; however, whilst the horse is not dependent on human action to act in the world, the car is (still) fundamentally dependent on human action to act in the world (Ihde, 1990). This is because the car must be turned on by the user, whereas this is not how horses 'work'. Moreover, as Albrechtslund (2006: 22) points out, the horse does not "only exist as an instrument for a rider, but also as a living being 'on its own' more or less without human intervention". For Verbeek (2005), it follows that:

> Technology appears in alterity relations as quasi-other because while we may encounter technologies in ways in which they seem to behave as an 'other', they can never be present as a true person…technology is *never a genuine other.* (Verbeek, 2005:127, emphasis added)

Ihde (1990) further describes a different kind of mediating role, called a *background relation.* This captures the way that technologies shape 'in the background' the experiences that people have in particular spaces, for example, when objects like refrigerators fade into the background of conscious experience. Albrechtslund (2008: 22) notes, "background relations are not experiences *through*, *of*, *to* or *with* technology, but relations *among* technologies. These relations are not explicit and not intentional, but can be compared to the atmosphere: Background relations represent a technological presence akin to a technosphere". Ihde describes the domestic character of such relations:

> I arise and turn up the thermostat which has been set low for the night. Unseen and barely heard, the furnace responds and in a few minutes warm air begins to circulate. As I prepare breakfast I pop some toast into a toaster which swallows the slices and in minutes returns them warm and brown. In these cases I have had a momentary relation with a machine, but in the modality of a deistic god. I have merely adjusted or started in operation the machinery which, once underway, does its own work. I neither relate through these machines, nor explicitly, except momentarily, to them. Yet at the same time I live in their midst, often not noticing their surrounding presence. (Ihde, 1979, p. 14)

These technologies are located at the periphery of human attention and can be understood as 'absent presence', as something not directly experienced yet giving structure to direct experiences. They are often hidden and automated, but nonetheless they influence our lifeworld – perhaps even more than the technologies we relate to in the foreground (Ihde, 1990, p. 112).

It is significant that computer systems are capable of entering into all four different types of human-technology relationship as outlined above; however, it would seem that computers most commonly and significantly enter into hermeneutic and alterity relations.

In hermeneutic relations, computers represent the world as being in specific ways, for example, as an internet webpage or a word processor document. In this sense, it can be argued that computers play a role in shaping our knowledge of the world: the way certain kinds of information are presented shapes how we interpret that information, for instance. More significantly, in alterity relations, the computer is experienced as a thing that exists 'in its own right', and as such, constitutes a specific object of curiosity. In this sense, a person might attribute a specific personality or set of moods to her or his computer, or enter into an emotional relationship with it.

This more peculiar aspect of human-computer relations is often remarked in the literature. In particular, Sherry Turkle (1984, 1995) and Reeves and Nass (1996) note that it is commonplace for people to *anthropomorphize* their computers. This process of anthropomorphism often occurs when the artifact in question is perceived as having salient *human-like* qualities, especially when it is experienced as having its own kind of *agency* or autonomy. As Turkle (1984) has argued, a consequence of our experiences with the computer as an 'other' that is located somewhere in between a dumb machine and an intelligent organism is that people are renegotiating their conceptions of intelligence, mind, self, and life, along with their attitudes. (Brey, 2009)

It is this peculiar quality of appearing other, yet not really being so, that underpins a basic fascination that people can have with technological objects. For Ihde (1990), the fascination is rooted in the fact that objects *qua* technologies (in alterity relations) *appear* or seem to be independent of human action. They seem as if they 'have a life of their own' or they seem to do unexpected things 'of their own volition'. This describes how people *experience* these technologies. Hence, the objects appear to have autonomy – and this is what allows them to seem as if they were genuine others.

On the basis of this understanding of having a *fascination* with technology, I turn again to the concept of having an *enchantment* with technology. Fascination is a necessary but not sufficient condition for enchantment; enchantment builds upon and develops the basic features of the initial fascination. However, enchantment is significant as it describes a

felt connection that people can have with specific technological artifacts, often associated with entering into a relationship of intimacy with that object, feeling as if the object *is known* as a thing in itself, and furthermore feeling like a relationship 'develops' with that technology over time.

Yet, it can also be seen that technologies tend to become more and more *lifelike* or *humanlike* over time, significantly regarding the apparent autonomy and independence from human beings in our everyday lives. For example, certain smart technologies could be seen to be increasingly like genuine others. This is further substantiated with the thought that people tend to display increasingly *social responses* to particular kinds of 'intelligent' technologies, treating them as if they were independent social beings. This can be seen by drawing out two particularly influential empirical studies in the area.

Two areas of more developed empirical research can be seen in research into Human-Computer Interaction (HCI). This research field explores how many people seem to come into contact with particular technologies and interact with the objects with the *same repertoire of social behaviours* that it might seem that they usually use to come into contact with other human beings. Hence, this concerns people's more explicit relations with technologies. The second field of empirical research concerns, in contrast, more *implicit* responses that people tend to display towards particular technologies. The first line of research appears as *anthropomorphism* and the second appears as *the media equation*. It is to a more thorough and critical presentation of these two lines of empirical inquiry that this chapter now turns.

4.2.2 Relational artifacts

The idea of *anthropomorphism* captures something intuitive about the way in which many people do seem to relate to technologies as if they were human beings. In her well-known publication entitled, *The Second Self: Computers and the human spirit* (Turkle, 1984), Sherry Turkle, Professor of the Social Studies of Science and Technology and

Director of the MIT Initiative on Technology and Self, presents empirical research concerning the use of computers, as they were first becoming a more familiar presence within society.

Turkle's research aims to explore how objects, like new technologies, change the way we think and how the constructions of our identities are informed by our relationships and interactions with these objects. Specifically, when she analyzed interactions with computers, Turkle observed "there was a real passionate *attachment* to the computer, a possibility to project yourself into the machine" (Baker, 2008). Moreover, Turkle (1984) came to the conclusion, that the computer is, "an ideal medium for the construction of a wide variety of private worlds and, through them, for self-exploration. Computers are more than screens onto which personality is projected" (Turkle, 1984:15).

Here, the computer is not only a *projective medium* but also a medium which allows the self to come into new and different relations *with the self.* This is a peculiar quality of the computer *qua* tool, which qualifies the computer as being an *evocative object*, which not only mediates the world for us, but which further brings us into critical relation with both that world and ourselves (Turkle, 1984:14; see also Turkle, 2007).

Following Ralph Waldo Emerson's 19th century reflection on dreams and beasts, Turkle understands the computer as a new 'test object' for the 20th and 21st centuries (Turkle, 1995). "Dreams and beasts are two keys by which we are to find out the secrets of our nature…they are our test objects" (Emerson (1832), as quoted by Turkle, 1995). For Turkle, computers, like dreams and beasts, are "objects against which we can measure ourselves; they have an evocative quality in that interacting with them provokes reflection on the nature of the self" (Turkle, 1997: 1093). Turkle suggests that such evocative objects are "notable for their concreteness, intimacy, fluidity of roles, emotional force, libidinal charge, uncanniness, and irreducibility to familiar schisms such as natural/artificial and human/inhuman" (Harman, 2008: 455). Computers urge us to reconsider traditional boundaries:

> The computer stands on the margins. It is a mind that is not yet a mind. It is inanimate yet interactive. It does not think, yet neither is it external to thought. It is an object, ultimately a mechanism, but it behaves, interacts, and seems in a certain sense to know. It confronts us with an uneasy sense of kinship (Turkle, quoted by Davis, 1999: 77). The line between the natural and artificial becomes increasingly permeable (Turkle, 1997).

In her studies Turkle describes how children have been affected by the realization that there is some *sort of life* in man-made objects:

> A generation of children is growing up who grant new capacities and privileges to the machine world on the basis of its animation. Today' s children endow the category of made objects with properties such as having intentions and ideas. These were things previously reserved for living beings. Children come up with the new category 'sort of alive' for describing computational animation, and they are increasingly softening the boundaries between the physical real and simulation.[18]

As a result of this change in perception concerning the 'aliveness' of artifacts, "people are learning to interact with computers through conversation and gesture. People are learning that to relate successfully to a computer you have to assess its emotional state; … you take the machine at interface value, much as you would another person" (Turkle, 2000:17).

Encounters with technologies presenting themselves as a 'sort of alive' are very new to the everyday experience of children and adults. Largely through the introduction of a class of interactive toys a wider set of objects have found their way into the consumer market: humanoid dolls, virtual creatures, and robotic pets. Sherry Turkle calls these objects relational artifacts. As a relational artifact Turkle understands "any computational artifact that presents as having a mind of its own, or better 'inner states' of its own. In order to interact at an optimal level with a relational artifact, one must 'read' its mind,

[18] Turkle, Sherry. ' New Media and Children' s Identity' (edited summary). Media in Transition Conference, MIT, October 1999. Available at web.mit.edu/m-i-t/conferences/m-i-t/summaries/plenary1_st.html.

that is, a user must treat the objects as appropriate for a social encounter - independent of the artifact's virtues". [19] For Turkle, "these objects are not just toys. On the contrary, they act as 'Darwinian buttons', in the sense that they push us to react to them, they demand our response" (Billings, 2007: 2).

Turkle reports that children first met relational artifacts with the 1996 introduction of Bandai's Tamagotchi[20], a small virtual creature whose screen is housed in egg-shaped plastic. (Tukle, 2006: 2) Bandai's website provided clear moral instruction to link responsibility with nurturance in the relationship with a virtual pet:

> Tamagotchi is a tiny pet from cyberspace that needs your love to survive and grow. If you take good care of your Tamagotchi pet, it will slowly grow bigger, healthier, and more beautiful every day. But if you neglect your little cyber creature, your Tamagotchi may grow up to be mean or ugly. How old will your Tamagotchi be when it returns to its home planet? What kind of virtual caretaker will you be?

These objects give the impression "of wanting to be attended to, of wanting to have their 'needs' satisfied, and of being gratified when they are appropriately nurtured." (Turkle, 2006: 2) Confronted with these relational technologies, children's focus shifts from cognition to affect, from game playing to fantasies of mutual connection and nurturance. We attach to what we nurture (Turkle 2004, 2005).

Turkle states that the extension of distinctively human qualities and ethical concerns to particular machines has not been found to be present only in younger children. More profoundly, perhaps, Turkle (1984) finds that adults also tend to engage in such behavior. In her texts Sherry Turkle different times recalls a series of conversations that she had with her professor in the 1980s, Joseph Weizenbaum. MIT computer scientist Joseph Weizenbaum's "landmark experiments in 1976 initiated a scientific understanding of human responses to social robots" (Billings, 2007: 3). Weizenbaum had developed a

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[19] http://www.videoludica.com/en/gameculture-en/2006/11/19/lecture-sherry-turkle-on-cyberintimacies/

[20] Tamagotchi Planet, "General Tamagotchi Information," quote from Bandai http://www.mimitchi.com/html/q1htm.

computer program based on the conversational strategies of a Rogerian psychotherapist, rephrasing statements from human 'patients' back to them as questions, thus supportively reflecting their thoughts. A user input of "My mother is making me angry," for instance, the program might return, "Tell me more about your mother" or "Why do you feel so negatively about your mother?" Weizenbaum's program was named ELIZA after the Galatea character in Shaw's play, whose mimicry of aristocratic speech propels her into high society. [21]

Weizenbaum was deeply troubled by what he discovered during his experiments with ELIZA: Some of his students exhibited strong emotional connections to the program; some actually wished to be alone with it (Weizenbaum, 1976). Weizenbaum comments:

> I was startled to see how quickly and very deeply people conversing with [ELIZA] became emotionally involved with the computer and how unequivocally they anthropomorphized it. Once my secretary, who had watched me work on the program for many months and therefore surely knew it to be merely a computer program, started conversing with it. After only a few interchanges with it she asked me to leave the room. Another time, I suggested I might rig the system so that I could examine all the conversations anyone had had with it, say, overnight.
>
> I was promptly bombarded with accusations that what I proposed amounted to spying on people's most intimate thoughts; clear evidence that people were conversing with the computer as if it were a person who could be appropriately and usefully addressed in intimate terms. (Weizenbaum, 1976:76)

For Weizenbaum, however, rather than signaling the success of the project, this led to some consternation: "ELIZA shows, if nothing else, how easy it is to create and maintain the illusion of understanding…a certain danger lurks there" (Weizenbaum, 1976: 42-43).

[21] http://www.jerz.setonhill.edu/if/canon/eliza.htm

Weizenbaum had unexpectedly discovered that, “even if fully aware that they are talking to a simple computer program, people will nonetheless treat it as if it were a real, thinking being that cared about their problems—a phenomenon now known as the Eliza Effect" (Billings, 2007: 3).

At this time, 30 years ago, Turkle somehow dismissed her mentor's fears. Turkle argued that ELIZA, was nothing more threatening than an interactive diary (Turkle, 2004). Nowadays, however, she ask’s herself if she did not underestimate the power of the program, and the inner desire of human beings to interact with such relational artifacts. One cannot be indifferent to such objects: when confronted with these robots, we cannot but develop some sort of ‘cyber-intimacies’.[22]

In her lecture at the Humanities Center at Stanford University in 2006[23], Sherry Turkle identifies two key features of cyber-intimacies:

> 1) They help us to better understand human psychology and human vulnerability. What really matters about the new generation of smart technologies is not their AI (artificial intelligence) but their ability to push the user to start, develop, and maintain a meaningful relationship with the computational object/subject.
>
> 2) A second principle is that the interaction with computational objects is moving from the psychology of projection to the psychology of engagement and object relations.

This reflects a certain suspicion of engaging with machines on *human* terms, and has important ramifications for the *type* of relationship that people develop with these machines specifically through engaging with them, and the way in which such relationships could be said to go beyond the traditional or more familiar relationships of mediation which arise through such relationships of mediation. There is not just a mediation *of the self*, but as has been suggested, a significant, self-conscious and directed

[22] http://www.videoludica.com/en/gameculture-en/2006/11/19/lecture-sherry-turkle-on-cyberintimacies/
[23] ibid

expansion *of the self.* In our culture of simulation relational technologies have become carriers of our way of thinking about the world and ourselves:

> In our culture, technology has moved from being a tool to a prosthetic to becoming part of our relational selves. And as a culture, we've become more comfortable with these closer bonds through our increasingly intimate connections with the technologies that we have allowed onto and into our persons (Turkle in "Technology and Human Vulnerability", 2003).

Following this line of thought, Turkle considers how these objects look from the perspective of self psychology and refers to Heinz Kohut, who describes how some people may shore up their fragile sense of self by turning another person into a 'self object'.[24] Turkle writes (Turkle, 2004: 3):

> In the role of self object, the other is experienced as part of the self, thus in perfect tune with the fragile individual's inner state. Disappointments inevitably follow. Relational artifacts (not only as they exist now but as their designers promise they will soon be) clearly present themselves as candidates for such a role. If they can give the appearance of aliveness and yet not disappoint, they may even have a comparative advantage over people, and open new possibilities for narcissistic experience with machines. One might even say that when people turn other people into self-objects, they are making an effort to turn a person into a kind of "spare part." From this point of view, relational artifacts make a certain amount of sense as successors to the always-resistant human material.

This can be further understood as creating a particular kind of *intimate* relationship between user and machine, seen especially in people's desire to be alone with the computer. Hence:

> People buy an 'instrumental machine', but they come to live with an intimate machine." (Turkle, 1984: 166).

[24] Kohut, H. (1978-1991) The Search for the Self. Selected Writings of Heinz Kohut: 1950-1981. P. Ornstein, ed. Four volumes. New York: International Universities Press.

Thus, what is so significant about these examples, is that people are engage in both *explicit* and *conscious* relations with these machines. Moreover, empirical research has been conducted into the way in which computers can be said to solicit both *implicit* and *automatic* responses. This suggests that anthropomorphism of computers runs more deeply than has been suggested, and that it is in fact a fairly *natural* response to technologies that seem to display certain kinds of 'human-like' characteristics.

4.2.3 Media equation

The tendency for people to attribute personality, intelligence, and emotion to computational objects has been widely documented in the field of human-computer interaction (HCI) (Weizenbaum 1976; Nass, Moon, et al. 1997, Kiesler and Sproull 1997; Reeves and Nass 1999). In 1996, Reeves and Nass, both part of the *Social Responses to Communication Technology* group at Stanford, published their book entitled *The Media Equation: How people treat computers, television, and new media like real people and places* (Reeves and Nass, 1996). This book describes different empirical experiments they conducted in the 1980s and 1990s and is now widely regarded as a classic in the field of human-computer relationships. Reeves and Nass (1996: 5) argue that, "individuals' interactions with computers, television, and new media are fundamentally social and natural, just like interactions in real life". For Reeves and Nass (1996) the slow pace of evolution may be the reason that the human race responds socially and naturally to media:

> The Human brain evolved in a world in which only humans exhibited rich social behaviors, and a world in which all perceived objects were real physical objects. Anything that seemed to be a real person or place was real. So we haven't yet adapted to the twentieth century media that only depict images, but which themselves personify the characteristics of human actors. (Reeves and Nass, 1996: 12)

As Reeves and Nass (1996: 251) explain, "Our strategy for learning about media was to go to the social science section of the library, find theories and experiments about human-human interaction – and then borrow…Take out a pen, cross out 'human' or 'environment' and substitute media. When we did this, all of the predictions and experiments led to the media equation: People's responses to media are fundamentally social and natural". As David Levy (2007: 76) states, "Byron Reeves and Clifford Nass describe interaction with computers as being fundamentally a social tendency, but in their view it is not consciously anthropomorphic. They regard such interaction as automatic and subconscious, a view that stems from the general denial by most people that they treat computers as social entities". The *Media Equation*, is summarized as follows:

> When people interact with information and communication technologies they need only very simple social cues from these machines to call forth a whole range of social responses that would normally only be reserved for interactions with other human beings, without being aware of the fact that this is happening. The most remarkable thing is that, when questioned about their behaviour, people tend to *deny* displaying such behaviours towards these technologies (Nass and Moon, 2000:87; Picard, 1997:14-15).

Following the publication of *The Media Equation*, Reeves and Nass extended their experimental research in collaboration with Youngme Moon. In 'Computers are Social Actors: A Review of Current Research', Clifford Nass, Youngme Moon, and their coauthors (1997) review a set of laboratory experiments in which "individuals engage in social behavior towards technologies even when such behavior is entirely inconsistent with their beliefs about machines" (1997:138). Even when computer-based tasks contained only a few human-like characteristics, the authors found that subjects attributed personality traits and gender to computers and adjusted their responses to avoid hurting the machines' "feelings." They suggest, that "when we are confronted with an entity that (behaves in human-like ways, such as using language and responding based on prior inputs) our brains' default response is to unconsciously treat the entity as human" (1997:158).

In another report '*Machines and Mindlessness: Social Responses to Computers'* (2000), Nass and Moon clarify that: "of the thousands of adults who have been involved in our studies, not a single participant has ever said that a computer should be understood in human terms or should be treated as a person" (Nass and Moon 2000: 83).[25] This is significant, as it suggests that people tend to think, when challenged to reflect on the matter, that there is something bizarre about extending human-like concepts, attitudes or attributions to computer technologies. The authors, however, found that in practice, people do tend to respond to computers *as if* they have a personality, and are further found to apply 'social rules' and 'social expectations' (i.e. those usually reserved for other human beings in particular) to those machines.

In this sense, it is the perceived or phenomenologically experienced similarity between computers and people that can be seen to ground the extension of particularly human-like concepts and attributions to distinctively non-human machines. As has already been pointed out that an alterity relationship is characterized by a perception of relative independence or autonomy of action on the part of the technological artifact. Moreover, it would seem understandable why computers might tend to be *experienced as* having this independence of action. Computers are furthermore capable of mimicking particularly human characteristics, such as speech and the ability to respond to specific and often complex inputs with the correct and often equally specific and complex outputs.

Nass and colleagues also examined the process of reciprocal self-disclosure, often examined within the discipline of psychology. Psychologists confirm that people tend to shy away from disclosing intimate information to anybody with whom they are not already intimate. However, psychologists also find that people are more likely to disclose such information to strangers, insofar as those strangers disclose first.[26] The experiment therefor investigates whether this pattern is observed from human-computer processes of self-disclosure. In the one case, computer questions are worded so that no disclosure or

[25] Nass, Cliffort, and Youngme Moon. "Machines and Mindlessness: Social Responses to Computers." Journal of Social Issues 56, no. 1 (2000): 81 – 103.
[26] Moon,Youngme. "Intimate Exchanges: Using Computers to Elicit Self Disclosure from Consumers." *Journal of Consumer Research* 26, no. 4 (March 2000): 323 – 339.

self-referal is present. In the second case, computer questions are worded so that disclosure is present, and sometimes from the first-person perspective. For example:

1a) What has been your biggest disappointment in life?

2b) This computer has been configured to run at speeds of up to 266 MHz. But 90 % of computer users don't use applications that require these speeds. So this computer rarely gets used to its full potential. What has been your biggest disappointment in life?

The first question is an example of non-self-disclosure, whereas the second involves a suitable candidate for 'computer self-disclosure' before asking the first question.

Overwhelmingly, the results show that the participants' responses are more *intimate* in terms of self-disclosure following the b)-type questions, where the computer is experienced as first disclosing a piece of information 'about itself,' compared to the a)-type questions where the computer is perceived as disclosing no such information. Intimate responses were both more detailed and more in-depth.[27] This is also the standard expectation for participants' responses to human disclosure and non-disclosure in a similar situation. In turn, this suggests that similar judgments to disclose or not to disclose are consistent across evaluations, for people on the one hand and computers on the other. For Nass et al. (2000:101), this shows that people do tend to – without realizing that they are doing so – extend the same 'rules' they apply to human-human interaction to particular kinds of human-computer interaction. Yet, significantly, "the participants in our experiments were adult, experienced computer users. When debriefed, they insisted that they would never respond socially to a computer, and vehemently denied the specific behaviours they had in fact exhibited during the experiments."[28]

This describes the way in which people can be said to display instantaneously social responses to technologies in certain situations, that this is further not the result of a

[27] Ibid.

[28] Nass, Cliffort, and Youngme Moon. (2000) "Machines and Mindlessness: Social Responses to Computers. "

process of conscious reflection or deliberation. This would suggest that people could be said to already think of certain technologies, or certain types of action displayed by certain technologies, as being human-like, and hence a viable candidate for being engaged with as if they were in fact human. In this way, displaying social responses to certain technologies would seem to be both *natural* and *acceptable* in the wider society. For Reeves and Nass (1996), this is because people tend to act socially in general as a kind of 'default' position, so that this is a normal way for people to approach the world around them. This fundamentally social approach is further justified by the literature, and could also be referred to as people's "default model for relating to others" (Picard, 1997:15). This could be said to be one expression of the basic phenomenological starting point of the fundamental relatedness of the social world, which is an underlying or background belief as people experience the world in the everyday. Hence, it is quite usual for people to anthropomorphize technologies, but also to display specifically *social* response to those technologies in specific interactions with them. In this way, all of the studies presented in this and the previous section confirm that people tend to approach computing technologies *as if* they were human beings (Reeves and Nass, 1996:6).

4.3 Intimate technologies: artificial companions

Throughout, this chapter I have critically appraised a number of academic, empirical studies and other evidence that jointly seem to support the claim that people tend to respond in a way that could be considered 'social' towards ICTs. The category of the *social* is here used in a broad sense, and means that people display a range of behaviour towards ICTs: for instance, people anthropomorphize ICTs, or relate to them as if they were independent beings, that they recognize they are part of society in some significant way. If, in general, people do respond in a 'social' way to ICTs in certain circumstances, this might suggest that information and communication technologies come under the category of *intimate* in a way that may not have previously been considered. There are many ways to understand *intimacy,* and a number of ways in which people's relationships with one another could be described as *intimate*, be this emotional, psychological,

physical or intellectual intimacy, some sort of *lived intimacy* in the sense of being constantly physically present in one another's surroundings, or simply *knowing intimately* who the other person is, what they think about things and how they might respond in a range of situations. This is to say that in everyday parlance, people tend to use the concept of *intimacy* in a range of different contexts, where it approximates to meanings some kind of *closeness* between two or more people. Hence, it seems logically consistent with this usage to extent the concept of *intimacy* to certain uses of ICTs. First, people who use computers regularly at work, and at home, could be said to have a *lived intimacy* with those machines. However, on this reading, it could also be said that one has a lived intimacy with oxygen. But second, people respond to computers *qua* people in a way that we tend not to think that the air or the desk are people-like. Partly, this is because that ICTs are considered to be *active* in a very basic way that the air is thought of as *passive*: this is not to say that ICTs necessarily *are active* in a way the air is not; rather, what is important is how people *think that* computers are active in some way, how they are *active to them*. Further, it could be argued that people get to *know intimately* how their ICTs will behave in a range of different situations; whereas, people do not tend to think there is very much that the air or desks and chair can *do*. And finally, it has been some people do *think of* their computers in terms that could be understood as being distinctively *human* or *humanizing*. So, whilst people might call a table leg a *leg* like a human *leg*, this is about as far as it goes for tables: it doesn't talk like people, it doesn't move like people do, it doesn't take in energy or deposit waste, and it would be odd to say 'the table is sad today' or 'my table must be in a mood, because it isn't standing up straight and rigid like it normally does, it isn't doing its job as a table properly'. And yet, all of these sorts of ascriptions *make sense* when applied to computers. This is not to argue that computers *are* sad, or in a mood, or that they are independent or indeed that they *have* human qualities. Rather, it is that it makes sense to *talk as if they do*. Hence, it seems to make some sense to argue that insofar as information and communication technologies are *intimate* in a sense that other objects and environments are not, that they solicit the kinds of responses that are traditionally reserved for human-human interaction.

The kind of interaction people have with their computers can thus be said to show significant parallels how people interact with other people. This leads us to question precisely *how similar* our social responses to such technologies are. Further, it might follow that these technologies influence how people construct, express and think about our *identities* in significant and salient ways. This topic of investigation might seem to be more relevant and interesting as technologies become increasingly 'lifelike' and 'smart'.

Such smart technologies have a number of specific characteristics that distinguish them from other types of technology. First, they are designed to be embedded in the surroundings of our everyday lives. Second, they proactively interacting with us and provide us with personalized specific services. Third, they could therefore be said to care for us and are able to adapt to our personal desires and needs. They conduct activities and tasks that were previously the domain of human beings, and take over various responsibilities from us. Furthermore, Kent Larson, who directs the house_n research group at the MIT states: "eventually, sophisticated systems will be self-programming, with the environment *melding* ever more intimately with the individual over time".[29] In this vision intelligent objects and related technologies participate in a larger transition to a world where human action is coordinated with complex virtual/actual environments characterized by flows and relations between many different agents, including non-human ones, tied together through distributed cognitive networks (Anne Galloway, 2004).

Artificial Companions (ACs) in particular, as have been described above, could in principle be typically thought of intelligent cognitive 'agents', implemented in software or a physical embodiment. It has been seen that part of the design aim or intention behind ACs is precisely to design technologies which can reasonably be thought of, and act like, intelligent cognitive and independent agents in the world.

The ACs are further intended, to remain with their users for long periods of time, learning to 'know' their preferences, habits and wishes. In this basic sense, as has been established

[29] Larson, Kent. ' The Home of the Future,' *A+U 361*, October 2000: 5

in the argument above, an AC could be said to enter into a close or *intimate* relationship with its owner. This is in the basic sense that it would talk to them, advise them, inform them, entertaining and comfort them, alongside assisting with various physical tasks and providing various forms of support. This can be appreciated in more concrete deal through a presentation of the Companions project conducted at Oxford University, led by Wilkes (e.g. Wilkes, 2005 and 2006).

It is first important to acknowledge that research into 'artificial companions' is speculative; therefore no firm conclusions can be drawn. However, there are obvious and significant *philosophical* implications concerning identity and *closeness between* people and technologies that can by considering the idea of an AC. Following O'Hara (2010), I therefore define a companion as a kind of agent:

a) With a *telos* determined by the intentions of an individual human being;
b) Which contains a great deal of knowledge about that individual, obtained from the individual (O'Hara, 2010:2).

It is possible to understand such companions as being significant from other technological objects that do our bidding in several important respects. First, a companion is designed to possess information in the form of a first-person perspective. Hence, it can be argued that *contra* the methodological individualism (i.e. Fodor, 1980) that characterizes philosophical and scientific understanding of the grounds for this first-person perspective, that *pace* O'Hara (2010), such companions would blur the dichotomies and conceptions, which underpin traditional notions of 'the individual'. It is therefore possible to see that the most intuitive way to think about companions is not in contradistinction to either human beings or to human individuals. Rather, it would seem more *natural* to consider ACs from a more 'functional' cognitive perspective.

Following this approach, human cognition is not defined by significantly neural processes specific to the human brain and biology, but rather comprises in:

> …our amazing capacities to create and maintain a variety of special external structures (symbolic and socio-institutional). These external structures function so as to complement our individual cognitive profiles and to diffuse human reason across wider and wider social and physical networks whose collective computations exhibit their own special dynamics and properties. (Clark, 1997:179).

It is important to note here the similarity that can be seen between this *functional* and significantly *social* understanding of human cognition with regards the wider environment – or here, 'external structures' – with the previously articulated notion of *script* as both a fundamentally *human* and *social* phenomenon. This is a somewhat abstract and very general point to make, but it is made to draw out the way in which very different philosophical and psychological paradigms equally highlight the way that human beings are fundamentally *social* beings, who do not exist in isolation from either other human beings or objects and practices in the world around them. For the functional cognitive perspective, this insight is drawn upon to define human cognition *functionally*, which is to say, through its function or *what it does* in the world. Hence, if other things apart from human beings can do the sorts of things that human beings can do and on the basis of are thought of as *cognizant*, then there seems no good reason to not extend the notion of *cognition* to these non-human entities in some way or other. Hence, on this understanding, many potential similarities can be drawn between the capabilities of people and those of companions. In particular, it is possible to follow O'Hara's (2010) parsing of Clark's (1999) notion of *diffused* reasoning, which means that it is possible to "see the mind as the human brain plus the engineered environment" (O'Hara, 2009:6).

The *human mind* is not primarily a metaphysical thing (human brain) somehow 'imprisoned' in the human body and mysteriously relating to the 'external' world, as on the traditional reading of Cartesian dualism. It has been mentioned already in this thesis, and is explored further in the later chapters, the way in which the phenomenological perspective, coupled with a particular reading of *identity*, implies that there are fundamental flaws in the Cartesian approach. But, rather, it is possible to understand the

mind from the point of view of a *unity* or *synthesis* with the wider environment. In this way, it is possible to break down or otherwise undermine the mind/body distinction that is a product of the methodological individualism that has characterized philosophy at least since the Enlightenment period. This also points the way for a more sophisticated understanding of the 'artificial' or 'technological' *mind*.

O'Hara (2010) draws out the cultural and moral implications of this line of thought by highlighting the importance of *trust* in the reliability of people's actions to the proper functioning of society. *Pace* Baier (1997), it is possible to acknowledge that without trust or reliability, it would be impossible to enter into specifically *moral* relationships with other people. Thus, if it can be accepted that certain 'artificial' entities can function like human beings in significant ways, then it would follow that they can also *potentially* enter into functionally defined relationships of trust and therefore morality. Further, "the actions of artificial agents require a human-created and mediated environment (as do human actors), but they do not need *direct* command" (O'Hara, 2010:7, his italics). Here, the more radical thrust of the argument is made clear, that *all social interaction is mediated*, not just by tools or technology, but also for higher developed forms of tool and technology. This represents a genuine extension of our concepts of both technology and people, and a radical deepening and extension of our explication of the notion of *mediation* more specifically related to notions of *intimacy*.

Further, it should be pointed out that this environment is a *human* created and mediated environment. Again, this means it is possible to appreciate the ultimate *human*-rootedness and function of more developed technologies like companions. Further, since it is a peculiar quality of distinctly human intelligence to alter the environment, it can be seen that companions who do alter the environment in these and similar ways – for example by conducted chores - and most especially in interaction with other people, are displaying profoundly *human* characteristics. Perhaps this is a moral good in itself.

If *pace* O'Hara (2010) companions are further understood as *avatars* of specific individuals, complete with copies of their first-person information, it can also be imagined that these companions could exist after the death of their original. Relevant to this thesis, the possibility has particular implications for the concepts of *intimacy* and *identity*. First, such a notion presents a challenge to the idea, prevalent in western philosophy since Locke, that personal identity is specifically *embodied* in a human body. This should be no surprise for the cognitive functionalist. Nevertheless, even though the companion would be physically distinct from the original, the companion would enjoy an "important connection" to their original (O'Hara 2010:11). However, it should be cautioned that this point the philosophical implications are speculative. It can be appreciated that the existence of such companions would challenge the dominant understanding of 'agency' and 'identity', and perhaps force us to extend them to non-human entities. On the other hand, these companions might allow us to *stretch* our concept of humanity itself. If we accept that companions display distinctly 'human' traits, this would maybe not be such a bad thing.

Hence, it has been shown that the relationship between a person and his or her companions is complex. When the companion adds substantially to the original's cognition, carrying out important cognitive or social functions, then it is plausible to understand the companion as making a significantly contribution to the identity *qua* personhood of the original. If the companion is seen to become more intelligent, capable and autonomous, then it might also be seen at the same time as having an identity or personhood (however derivative, metaphorical or incomplete) of its own. The simple hierarchies usually taken to characterize relations of identity between people and artificial agents become more difficult to sustain. The relationship between companion and original would seem to become increasingly symbiotic. Consequently, O'Hara argues, that the relationship between a companion and a person may become increasingly problematic as companion technology improves and as models of users become increasingly sophisticated:

> As with any kind of content-storing technology, such as writing, or in more recent years laptops, the amount and quality of cognition that a human can 'export' to these outside technologies is significant. The 'profile', 'person', 'hybrid' or 'agent' can be seen as an extended system including the technologies as well as the human, in which the technologies, among other things, can help in the extension of trust towards the human. If companion technology becomes so sophisticated that the companion is capable of acting independently in its original's interests, then the relationship becomes even more difficult to describe, because there will be a case for regarding the *companion* as a person or an agent in significant ways, too. (O'Hara 2010:17)

In this sense, not only the concept of *identity* is drawn into significant question, but also what it means to have an *intimate relationship* with technology in particular.

4.4 Conclusion

In conclusion, it has been seen that this tendency towards an increasing integration of the informational web into our daily physical world with smart objects as shown in this chapter is likely to make the development of successful profiling and personalization algorithms, like the ones currently used by internet companies such as Amazon, even more important than today. This chapter has also sketched the foundations for an understanding of the sort of *intimacy* that might emerge between people and various forms of advanced or new technologies, and again highlights the dimension of *morality* that these new relationships foreground. In the next chapter, I will build on these foundations to investigate how the subjective experience of one's identity can become affected by such technologies.

Chapter 5: Digital Technologies of the Self

> Maybe the most certain of all philosophical problems is the problem of the present time, and of what we are, in this very moment. (Foucault, 1982:216)

5.1 Introduction

This chapter assumes that the central claims (C1) and (C2) of the argument of the thesis have been established. It relates to the overall trajectory of the argument by examining in detail both the practical ethical concerns relating to smart technologies and the peculiarities of profiling and identity mediation. The main theoretical work of the chapter, in relation to the overall argument and specific aims of the thesis is to establish (TO3): To apply Foucault's study on moral self-constitution to the function of intelligent technology in general and persuasive technologies in particular, to explore how far intelligent technologies can be seen as a form of subjective freedom, properly understood. The main practical work of the chapter is intimately related to this theoretical work, and is to fulfil (PO2): To assess the various ethical issues surrounding by profiling machines in particular (data mining), to explore how such technologies may impact upon identity formation and to sketch possible practical implications. The chapter thus relates to the trajectory of the overall argument by moving into a specific study of the application of Foucault's ideas about 'self-care' and the particular role and function of profiling technologies. It represents the most in-depth exploration of the central claim (C1).

This thesis has touched on the notion of *identity* insofar as I have raised issues of subjectivity, of social power, moral responsibility and autonomy. I now embark on a more thorough exposition of the concept, and how far it can be said that our *identity* is located in the mediation of our subjectivity by technology.

I first explore Foucault's influential idea of *technologies of the self*. This idea has been central to much theoretical work concerning identity construction, and explores from a historical and social perspective the way in which selves are created in particular historical circumstances and by way of particular technologies that emerge during those times. I introduce, significantly, the idea of an identity *apparatus*. This allows Foucault to raise several important critical points of investigation concerning the dynamics of social power, freedom and control. I argue that Foucault can be understood as building on in some way the critical project of Heidegger, insofar as the latter thinker was concerned to bring out a certain *ambivalence* about modernity, and more specifically, concerning the potential of new technologies in roles of, variably, 'controlling' us and allowing us to transform ourselves in an ongoing project of personal liberation.

Drawing on this concern, my argument goes onto explore Ricoeur's concept of 'narrative identity', linking this more explicitly to the role of technologies in identity construction. Ricouer is significant in offering a persuasive characterization of previous work on *identity*, categorizing it as concerning what he terms either 'idem'- or 'ipse'-identity. I explore the interplay of these two aspects of identity through drawing on relevant commentary and development from a range of thinkers, and look in more detail at the *temporal dimension* of identity, following Ricoeur's contention that this has often received less attention in the literature, yet is an important feature of how I experience ourselves as *persisting* over time. This allows us to then consider particular technologies that allow us have what I introduce as a particular kind of *memory*, which can persist after our physical death and also play some part in constituting 'who' we are. The resonances with some of the earlier discussion on new technologies that allow us to externalize various aspects of our personality should be clear.

This then allows us to turn to the process of *profiling*, and to draw out some of the important implications of both Foucault and Ricoeur, drawing on the earlier work of Heidegger and also Ihde as seen in Chapter 2. I examine the idea of *profiling* in general as articulated by psychologists, and go on to explore how it can be further elaborated by reference to the way in which machines can use various types of algorithms. Following many of the theorists in this area, I argue that ambient technology brings something incorrigibly *new* to our idea of profiling, and that the profiling machine does something *more* than simply querying databases for stock responses. This then leads to a useful discussion about the way in which such technologies can be understood as coming into relationships with people such that they serve to affect the interplay between 'idem'- and 'ipse'-identities in significant ways. I introduce the concept of the *anticipation* in the complex interactivity between 'idem' and 'ipse', and briefly explore how this is related to identity creation and touch on issues of social power and control.

Finally, I turn to a brief explication of the concept of *reference groups*. This builds on our investigation of the role that technology can play in identity formation and mediating our relationship with the work by bringing out more of the *social* aspects of this process. A *reference group* is an entity that people develop their self of self and various frameworks of meanings *in reference* to. What I find significant about this concept is the way in which it emerges in distinctively modern, and primarily contemporary societies since the 1960s, characterized by more compartmentalized lifestyles and diverse social and identity groupings. I find some resemblance between the notion of a *reference* group and that of Foucault's 'dispositif', or 'identity apparatus', and go on to draw out the implications of influential work completed on this concept such that *any* object can play the part of a reference group. This has led me to a more developed conclusion of the way that ambient technologies might allow us to construct our identities.

5.2 Michel Foucault: technologies of the self

Michel Foucault (1926-1984) was a French philosopher who developed influential work on the nature of power in modern societies, particularly regarding sexuality and the prison system (mostly published in the 1970s). He worked for most of his professional life as an academic in France and later America, and considered himself to be particularly influenced by Kant's critical engagement with modernity and Nietzsche's twin concern with genealogy and power. The philosopher was also a public intellectual and political figure around the *évènements* of Paris 1968, and is associated with the political left. It can be seen that Foucault developed and wrote in very different context from other philosophers I have considered in this thesis, specifically Heidegger, Ihde and Verbeek, and was significantly also concerned with a profound *political* engagement with the society of which he was a part, related to a general programme of being concerned with the freeing of the human subject from dominions of power. In this, very general way, he can be understood as sharing a common concern with the other thinkers and related ideas explored, insofar as he focuses on the transformative effects of technology, for both the individual and the society.

A central concern for Foucault, given he holds importantly that the self is not 'naturally given', is to determine how the self – in terms of subjects and their sense of identity – is constituted instead through apparatuses, or *dispositifs* (de Vries, 2010:72). This represents an important development in the study of identity. An important methodological step taken by Foucault is therefore to move from locating the kernel of a person's self in the inner life of the individual, and to consider instead the systemic factors that can be said not to fully determine, but to shape or structure an individual's "field of possible behaviour" (de Vries, 2001:73). It can be seen here that there is a resonance with both Heidegger's and Ihde's general contention that human experience is mediated in the sense of *structured* by the shared social world that we inhabit. Significantly, for Foucault, this is based on the idea that there are systemic factors in society governing how selves are constituted in particular circumstances. Indeed, this is one of the more interesting social consequences of some of his work concerning sexuality

and prisons. This could be understood, in general, as being a constructivist and non-essentialist approach to the self, or identity. One example of Foucault's understanding of how social norms and expectations can be embodied in particular practical spaces and social praxes was presented in his example of the 'coding' of the space in dormitories as being a 'script-like' interpretation of objects in Chapter 3. I now turn to looking in more detail of how, for Foucault, the self is constituted through the relations it enters into with its wider environment, with a view to exploring the influential idea of 'technologies of the self' as theorized by Foucault in the early 1980s.

The general concept of the *dispositif* or apparatus can be understood to be ambiguous (Agamben, 2009; Deleuze, 1992); nevertheless, it is a concept, which allows us to transcend certain traditional dichotomies (such as 'physical/cultural') which are sometimes constraining or distracting when attempting to understand the construction of the self through technologies. Hence, an apparatus can be understood as "a practice - which can consist of both 'social' techniques and 'technological' devices" (de Vries, 2010:73). This definition allows us also to understand people as apparatuses. Following Agamben (2009), a wide definition of *dispositif* can be employed, incorporating from navigation to cigarettes to language itself; therefore, any apparatus that a living person enters into a relationship with can be said to somehow contribute to the constitution of the self. However, it should also be added that some *dispositifs* are more socially, culturally and so on significant or prevalent than others. For de Vries (2010), this also implies that any *dispositif* is also an identity apparatus. The question then becomes how the particular identity emerges in each particular context. This 'emergence' of the subject can be understood as being the result of a complex of mediations using a range of *dispositifs* in different sorts of ways. So, the term *assujetissement* could be introduced to describe this complex process, and which:

> …is a term which covers how the individual is 'subjectified' in relation to forms of knowledge and discourse, 'subjected' in technologies of domination, and 'subjectifies' him or herself in relation to rules and techniques of ethical conduct. This triple fabrication of the subject is thus

> not simply an effect of domination but a complex result of practices and techniques of power, knowledge, and ethics. (Dean, 1994:112-113)

One can see here that there is nothing 'obvious' about how subjects are constituted on the understanding of Foucault. Rather, he could be understood as providing a theoretical framework which allows us to understand how *subjectivity* both arises and is experienced in the modern age – including how it is that I might self-consciously try to construct ourselves in particular kinds of ways. There is also an important thread running through Foucault's work in general concerning how far subjects are governed or controlled by particular *dispositifs*, and how far subjects are free. According to Foucault, technologies of the self in particular are certain types of technologies that:

> …permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection or immortality. (Foucault, 1988:18)

This shows the way in which individuals can have some conscious interaction with the formation or 'transformation' of themselves, indeed, that they might even enter into relationships with specific kinds of *dispositifs* for that explicit purpose. For example, explaining the early use of technologies of the self during the Hellenistic age in Ancient Greece, Foucault (Foucault, 1988:27) described how writing about the self could be understood as an important aspect of taking care of oneself. Writing was used in "taking notes on oneself to be re-read, writing treatises and letters to friends to help them and keeping notebooks in order to reactivate for oneself the truths one needed" (Foucault, 1988:27). Here it is described in an explicit way that technology allowed people to express oneself in a particular way, to keep a written record and to have something 'external' to keep this information in, and thus, that it represented something significant with regards to the self. For the purposes of my investigation, I would warn against to promiscuous a definition of *dispositifs*, as in this case what is important about the development and use of particular kinds of technologies and their effect on the self is lost.

For de Vries and Hildebrandt (2008), the question of how far a person is manipulated by particular *dispositifs* and how far a person is free can be better understood by making a distinction between manipulation by violence and manipulation by power (Colas 1992; Foucault, 1982). For example, being manipulated by violence would mean being forced to drink Coca Cola by somebody putting a gun to our head; being manipulated by power meanwhile might mean watching a particularly persuasive advert. For Foucault (1982), a key difference between the two was that the second is an *indirect* manipulation, and hence human beings can have a range of different responses to it. The second also serves to *structure* our experience, and hence helps to define a set of possible – or at least more probable – responses. Nevertheless, I should point out that by its nature, for manipulation by power to be distinguished from manipulation by violence, this necessitates the existence of *free subjects*, who can resist: "freedom must exist for power to be exerted…since without the possibility of recalcitrance, power would be equivalent to a physical determination" (Foucault, 1982:221). In a somewhat oblique way, this echoes the Heideggerian notion that was seen in Chapter 2, that modern technology is concealing in the sense that it conceals its true nature as one of *many* mediations from which a subject can choose – the point being that this isn't absolute.

However, there is a similar kind of ambivalence about this frustrated promise of modernity in Foucault that was suspected in Heidegger. There is also a similar nod to the way in which our lives are permeated by technologies. In relation to Foucault, this thought was well expressed by Deleuze (2000), who pointed out that in order for liberty to emerge in its modern form that a long process of social and cultural development was necessary, and that there should be no surprise that Foucault took part in political struggle. For instance, the alphabet had to be established and learned before I could exercise freedom of speech and freedom of expression: a certain discipline must have been exercised before I can begin to exercise a freedom of action (Agamben, 2007). Hence, again with echoes from Heidegger, what becomes important is the idea of the self as constantly *transforming* or *becoming*; for Foucault, quite consciously, too. Hence, the central point becomes the importance of increased and more useful possibilities of our practices to better help us on a quest of a sort of self-overcoming, or self-transformation,

so that Foucault can demand: "a pragmatics of transformation that demands nothing less than a moment-to-moment awareness of the virtual nature of ourselves" (Varela, 1999). Considering this more specifically regarding technology, this could be interpreted as premising the importance of developing better technologies that people use in a self-conscious manner, in order to transform themselves. This would be to defend a self-transforming technology of the self.

I now go on to build on the framework of *dispositifs* articulated above to explore in more detail how *identity* is constituted, drawing particularly on the work of Ricoeur.

5.3 Paul Ricoeur on narrative identity

Identity is a contested concept, which has conflicting meanings in the literature. Within the 'analytic' philosophical tradition, *identity* is a logical relation that one thing has to another thing when the two are qualitatively and quantitatively the same. Hence, it is a tautology to say that a thing is self-identical. On this approach, things evaluable for the identity relation include physical things like objects and properties, and also semantic things like propositions and meanings. Meanwhile, in the more 'continental' philosophical tradition, the term *identity* tends to be understood either with reference to a subject's experience of themselves, or in the more everyday sense when we talk about how we *identify* ourselves – either in terms of socially accepted categories such as 'male' or 'female', or in terms of whether or not we have the identity of an optimistic or a pessimistic kind of person. One particularly powerful theorisation within this tradition is the work of the French philosopher Paul Ricoeur (1913-2005), who distinguished 'ipse' and 'idem' identity. Ricoeur worked within a phenomenological tradition concerned with hermeneutics, and was drawing on, amongst others, the work of Heidegger. He was also present in France during the 1960s, but, unlike Foucault, was considered a tool of the Government rather than an influential philosopher. Ricoeur published his work on identity and narrative in the 1980s and 1990s.

Importantly, a critical engagement with the work of Foucault underpins the project outlined by Ricoeur. As I noted, there is an ambivalence about modernity, and especially

the role of technology in modernity, in Foucault, which can be seen rooted in Heidegger. This is a useful point of departure for a number of thinkers: how far is the subject *free* and how far is the subject *controlled* by the exercise of various sorts of power in the modern world?

> [Foucault] sounds a clear warning about the dangers of the increasingly popular narrative conception of self. Without a critical capacity, such a model is going to succumb to the coercive discourses of modernity. However, it is not clear that Foucault's non-normative, non-evaluative account of power can provide the necessary moment for critical reflection either. What Foucault needs is an aesthetic model with a critical capacity. This is what Paul Ricoeur tries to provide in his account of the narrative self. (Atkins, 2005:209)

Here, Atkins (2005)[30] premises the importance of the subject's *critical capacity*, in order to overcome what are considered the "coercive" discourses (and I might add, social practices) of modernity. He compares the earlier, 'narrative' account of identity, with Foucault's 'non-normative' and 'non-evaluative' account of power, and concludes that the two must be somehow synthesised. This is what Ricoeur's account of 'narrative self' also tries to achieve.

5.3.1 The narrative self

For Ricoeur, there are two different sides to what is thought of as 'self' or 'identity' – our 'I' – and these come together in time to form us. It is this "temporal dimension of the self and of action as such" that has been the "great lacuna" in previous work on the self (Ricoeur, 1994:113). The aim is first to come to some understanding of previous accounts

[30] Atkins, K. (Ed.). (2005). *Self and Subjectivity*. Oxford: Blackwell Publishing.

of *identity*, and then to overcome the limitations of each to synthesise a new account, which pays due attention to our temporal dimension.

A central distinction made in the work of Ricoeur is between the two categories of identity: 'ipse'- and 'idem'- identity. This distinction is supposed to clarify previous thought on the nature of *identity* in general, by splitting it into two broad camps. This distinction could be further argued to be "an extremely powerful and radical philosophical gesture with regards to the philosophy of the subject" (de Vries, 2010:74). It counterposes theories that can be thought of as theorising an "exalted cogito," a Cartesian cogito, which is free, autonomous and self-determining – with the "shattered subject" of theorists such as Foucault, Hume, Wittgenstein and Nietzsche, who are thought of as theorising a "humiliated subject", roughly identified with a bundle of experiences. Hence, 'idem'-identity is this bundle of experiences (*pace* Hume), which is further what picks us out as having *sameness over time* and which also allows us group membership (e.g. my property of liking Beethoven's string quartets gives me membership to the group of people who enjoy Beethoven strong quartets) so I have *sameness with others*. This 'idem'-identity then 'gives rise to' our subjective experience of ourselves, our 'ipse'-identity. I can say that this is a type of existential experience. Both 'idem'- and 'ipse'-identity are the same thing, but the latter is "experienced in a different way – as unique selfhood" (de Vries, 2010:74). This is further an act of us appropriating our 'idem'-identity as belonging to us:

> …sameness is the permanence of a person's fingerprints, or genetic code; on the psychological level, it is what is displayed as character – the word "character", moreover, is interesting, being the term used in printing to designate an invariable form. While the paradigm for 'ipse' identity is, for me, making a promise. I shall hold firm, even if I change. (Ricoeur, 1998:89-90)

What is interesting here are two points. First, that Ricoeur identified sameness over time ('idem'-identity) with having "an invariable form" – which means that *some* things are the same over time about us, and these are salient things, whereas other things *can*

change. Further, this invariable form is not just various physical properties of our bodies, such as genetic code, but also has a psychological level, designated by the term 'character'. The second point is that 'ipse'-identity is understood as *making a promise* (to myself), it is taking on an obligation (to ourselves) that I will continue being in a certain way, even if other bits of us change. I could understand promise making as being a kind of *moral* act.

This would then lead to the charge that Ricoeur was "still trapped by a special Cartesian *cogito*" (de Vries and Hildebrandt, 2008:22). This is because it would seem that he is logically dependent on there being something 'outside of' or 'beyond' the *'idem'* to begin with, which allows the *'ipse'* to act. It would assume that there is some 'I' to which I have direct experience – thus, Ricoeur "denies the possibility that one might have direct access to one's own '*I*', because for him, (building on aspects of Foucault), our experience of '*I'* is mediated "through the experiential traces created by the identity apparatuses to which one is exposed" (de Vries, 2010:74). But as the author shows, this charge falls away as it is considered how 'idem'-identity and 'ipse'-identity interact with once another in Ricoeur's rendering of 'narrative identity'. For Ricoeur, the *self* is always mediated, and this has always been the case:

> Thus, why prefer *das Selbst* (the 'self' or 'oneself') over *das Ich* (the 'I')?…In the first place, as is suggested by the grammar of numerous natural languages, the term *Selbst* is a reflexive form…Its reflexive character excludes the immediate intuition of the *I* and rather requires the long detour through objectifications. (Ricoeur 2008:143-142)

Here we can appreciate Ricoeur's denial that there is an "immediate intuition" of the *I*, and this is perhaps what can be best understood by his rejection of the 'Cartesian *cogito*'. Rather, there are a series of 'objectifications', which suggests a more dynamic relationship with the external world.

This leads me to the way in which *identity* is self-reflexive, and also a key form of self-interpretation. As 'narrative identity' I consider the way in which the unified self (*'idem'*

and *'ipse'*) locates itself with reference to *time*. For Laitinen (2002), there are as much as eight references to narrative identity as a mediation in Ricoeur. Of these, the significant ones for our purposes are narratives concerning identity as:

1) Containing both *harmony* and *concordance*; hence, narratives mediate these opposites, bringing about "concordant discordance" and "discordant concord", especially "when the discordance in question is *temporal*";
2) Being both *lived* and *told*, as "narrative configurations" mediate the worlds of action and reader;
3) Being both innovative and based on established views, hence mediating a dialectic of *innovation* and *sedimentation;*
4) Mediating two kinds of permanence in time: they mediate *'ipse'*-identity and *'ipse'* supported by *'idem'*-identity. (Laitinen, 2002:58)

The last kind of mediation is what I am primarily concerned with, as it concerns our experience of ourselves as *temporal* or *in time* and also as persisting *through time*. Hence, the mediation of 'ipse' and 'idem' by narratives of the self allows for:

> …an intervention of narrative identity in the conceptual constitution of personal identity in the manner of a specific mediator between two poles of character, where *'idem'* and *'ipse'* tend to coincide, and the pole of self-maintenance, where selfhood frees itself from sameness. (Ricoeur, 1992:119)

Here on can hear the echo of Foucault's notion of 'self-maintenance' as central to the development or becoming or transcending of the self – for Ricoeur, this takes places as *'ipse'* and *'idem'* are mediated through narratives of the self. There is also the idea of selfhood being 'freed' – or rather, 'freeing itself' – from sameness, which is to say that the development of personal identity is an ongoing process of personal liberation. There is also the sense in which narrative identity mediates extremes for Ricoeur (Laitinen, 2002). Further, for Laitinen (2002), drawing on Taylor (1985), our self-interpretations can happen in both *explicitly* as I try to answer the question 'who am I?' and through

implicit ways, such as the way that I orient myself in the world and are living, right now. There is a "threefold dialectic" between these ways, which consists of our *implicit functioning* in the world, our *explicit statements* about ourselves and who I am, which take an external form, and the *internalisation of self-definitions* where they turn into habits (Laitinen, 2002: 63-64). It can thus begin to be appreciated how identities become *established* over time and through particular narratives, the importance of *externalising* various ideas and categorisations of our selves, and also the way in which this is an ongoing process. This is linked, significantly, through Taylor's (1989) emphasis on considering a person's life as *whole* to Heidegger (1964), who wrote that it is only as an object of care that a person's life can *be* whole. There is a central existential, and to some extent profoundly ethical, aspect of Ricoeur's philosophy, and the key role played by narratives of the self, *viz.* Foucault's basic idea of *technologies of the self*.

5.3.2 Self, history and memory

For de Vries (2010), it is possible to build on the general idea of technologies of the self in the context of Ricoeur's theory of narrative identity through the reading of Stiegler (1998, 2003, 2010), who concentrates on the importance of *memory*. There are three kinds of memory according to Stiegler (1998, 2003): genetic memory, somatic memory and technical memory. The first concerns any organism's DNA; the second is about inscribing an organism's nervous system with habitual responses to stimuli; whereas the third is a peculiarly *human* characteristic (de Vries, 2010). Technical memory can be associated with the *history* that human beings leave behind; it requires a *retentional apparatus* that allows memory to persist after the individual's life. This could be a book, or memorial. Significantly, technical memory emerges with new technologies for Stiegler (2003), echoing Foucault's idea of *technologies of the self* such as the diaries that were seen emerging in Hellenistic Greece. A retentional apparatus thus, "has the capacity to retain traces of a world which lies beyond our *lived* experience. Such traces can be constitutive for who we are" (de Vries, 2010:75), which further does not imply their meanings are 'transparent' to us.

Hence, 'ipse' can be understood as experiencing one's 'idem' as "only being *its* past, which is nevertheless its own" (Stiegler, 1998:218). For Laitenen (2002), this is further linked to Heidegger's notion of being-in-the-world that was met in Chapter 2 of this thesis, significantly the experience of *being-in-time* as having an inescapable structure of self-interpretation. This is linked again to the idea of our experiences of ourselves being *structured* in particular ways, which I could further add as happening in particular ways *through* particular artifacts (*pace* Foucault and Ihde), which can then be said to 'co-constitute' the self, or in more everyday terms, to become in some way 'a part' of who we are. It is to one particular aspect of this co-constitution through particular types of technology that I now turn.

5.4 Profiling

In contemporary times, *identity* is not only a topic of theoretical perspective; it is a shibboleth (Derrida, 1992, in de Vries, 2010). Since at least the emergence of what could be called the groundwork for modern society, and with it a particular time of self-awareness I could loosely term 'historical consciousness' (i.e. awareness of the past *qua* history, and me as a product of the history) in the Medieval period, *identity* has also functioned as a social method of discrimination, saying who is 'in' and who is 'out'. This is the function of identity that so interested Foucault concerning views about sexual morality and deviance. For example, passports have been used since the Middle Ages to regulate border control (Grobner et. al., 2007). This shows how *identity* is important to more than simply *me*. Further, for many authors, the rise and growth of the internet has hurried on this process of 'border control' in myriad ways, for example, the IP-address as a mode of identification and discrimination, yet has further given rise to, because of its distinctive form, very new types of distinctively commercial exploitation. For Badiou (2003), particular 'social images' of particular identity groups can be said to authorise new products for those particular groups, to such an extent that it can be said that "capital demands a permanent creation of subjective and territorial identities" (Badiou, 2003:10-

11). Whilst it can be pointed out, *pace* Rose (1999), that such 'consumer identities' have been an important part of the market since at least the middle of the twentieth century, nevertheless, it has created a new type of sophistication with the abilities of digital technologies online. For Hildebrandt (2007:2), we "live in an age of identification," as both business *and* Governments strive for ways to better identify and regulate their citizens for a range of reasons: tax purposes, to prevent crime or fraud, to establish liability and so on. Indeed, I have noted already that the interest in new technologies, apart from researchers, comes mainly from business (Philips) and the European Union (EU).

A number of authors in the literature explore the importance of *profiling* in these new kinds of technologies, drawing out the different considerations in terms of identity construction, power relations, control, privacy and freedom. It can be said that "profiling is as old as life as itself" (Hildebrandt, 2007:3). It is also a defining *human* characteristic when it takes the form of organisms being capable of constituting themselves over their environments (Maturana and Varela, 1991), which is effected by a dual process of and the interplay between monitoring and recognition that leads to a developed ability of *pattern recognition*. In this sense, *profiling* is a broad concept to describe the way in which human beings develop typographies for understanding and categorising the various objects we come across in the world. In a much more developed and contemporary form, specifically regarding social praxes, this is expressed in our ability to delineate and deal with *stereotypes*. This can be understood more precisely in the context in which it has been developed; namely, as a tool for business to define their customers in a variety of ways, to delineate their preferences, and to begin to 'predict' what these customers may want to consume in the future. Hence, it can be seen that there are now *profiling algorithms* in certain systems that try to anticipate their users (Horvitz, 2007), and which are moving from the digital into the 'real' world.

As I stated in Chapter 1, the realization of the AmI-vision depends on the development of profiling technologies, which act as a conduit between the plethora of trivial data about an individual's activities and habits, preferences and environmental conditions. One must

keep in mind, though, that most of these technologies only generate an enormous amount of data, which may not reveal any knowledge until profiling technologies are applied. Profiling has an *interactive* quality, it can 'learn'. This is to say that ambient intelligence goes beyond querying a database and returning data about a pre-defined category or set of attributes; rather, it is about finding out things that I did not know about the data, in the sense that I can call the data 'new' (Zarksy, 2002-2003; Custers, 2004). Both Zarsky (2002-2003) and Custers (2004) emphasize that the knowledge generated by profiling machines is new. Zarsky speaks of data mining "answering questions users did not know to ask" (Zarsky 2002-2003: 4). The standard debate therefore tends to see the 'threat' inherent in such technologies, specifically regarding issues of privacy, security and unfair discrimination (Hildebrandt, 2007). However, there are also significant issues raised about the nature of *identity* if people were to interact with such ambient technology on a regular, daily basis.

5.4.1 Profiling 'idem' and 'ipse': who am I?

For de Vries and Hildebrandt (2008), one important point about such machine profiling is that it takes places without person's conscious awareness, and I might add, this discreetness is part of what makes such profiling attractive from a number of perspectives. The authors consider what it might mean to *resist* certain profiles that are made about us in our everyday lives, in the sense of how I learn to challenge particular assumptions about who I am, and hence how I might act. This is conceived as a generally positive process of both learning about and transcending our 'selves'. It is also linked implicitly to the idea of a narrative identity insofar as I can understand myself as being a being with a particular personal history and temporal existence more generally. Hence, it becomes possible to 'resist the present' by appealing to our pasts, in order to re-imagine for ourselves a different future. More succinctly:

> We will then think the past against the present and resist the latter, not in favour of a return but 'in favour, I hope, of a time to come' (Nietzsche), that is, by making the past active and present to the outside so that something new will finally come about, so that thinking, always, may reach

> thought. Thought thinks its own history (the past), but in order to free itself from what it thinks (the present) and be able finally to 'think otherwise' (the future). (Deleuze, 2000: 107 and 119; referring to Foucault, 1985:9)

What is striking about this passage is the way in which it is the *critical faculty* of 'thought' of the *I* that allows us to conceive of new ways of *being* as opposed to the way that it is in the present. A similar idea was seen in Heidegger's conception that it is of central importance to understand particular technologies as particular ways of revealing the world (and hence of co-constituting our being-in-the-world), but, importantly, not the only ones. Hence, it is the faculty to 'think otherwise' that becomes key to 'resisting the profile'. Note that this doesn't entail a crass refusal to participate in profiling processes or the social praxes that contain them; rather, it is to fully enter into those processes with a critical awareness of what they are, with the intention of overcoming them – and creating *better* or more *useful* (etc.) kinds of profiles in the future. This thus connects the idea of 'resisting' firmly to that of 'controlling', *pace* Foucault. This further allows us to see the very complex, and constant, interplay of 'idem' and 'ipse', along with the way in which the 'ipse' identity is constantly being challenged and reformulated, as we ask ourselves who we are in the here-and-now:

> I have to do this in terms of an *'idem'*-identity which never completely covers what and who I am *right now*: 'I am American (*'idem'*-identity) – that is an identity created by e.g. the songs I used to sing in primary school, my passport and the television series I watch – but what is it to be American *here and now* (*'ipse'*-identity)?' (de Vries and Hildebrandt, 2008)

From this perspective, the importance of the critical *'*ipse' can be seen. This is further contextualised in the idea that profiling can 'interfere' with the interplay of 'idem' and 'ipse'. For de Vries and Hildebrandt (2008), regular interaction with profiling software in the form of daily smart objects would 'outsource' the way in which we anticipate particular kinds of things and events and responses in our daily lives. It is no longer *me* that anticipates that I will need to wash my hands after eating prawns, but my smart house that sends a little bowl of water over on wheels. For de Vries (2008), identity

constructioin relies on *double anticipation* - the act of profiling how we are being profiled. Double anticipation happens precisely in the complex interplay of 'idem' and 'ipse'. Hence:

> Thus, when a young female executive head of a large firm is mistakenly profiled as a secretary ('*Could you please copy these files and bring me some coffee?*'), she has a possibility to not simply internalise the gaze of others ('*Maybe I am indeed less competent than other executives and more fit for more simple tasks like making coffee*') but to counter profile ('*Ah, a typical male chauvinist pig who thinks that all cute looking girls must be mere secretaries – it's clear that I can be an important role model in emancipation*') making her identity a locus of resistance. (de Vries, 2008:18).

The point here is that the executive's *identity* is made a locus of resistance. However, I have quoted the example in full because it brings out an interesting feature often found in the literature. This is the way in which particular identities are understood as simply one out of many possible identities that a modern person can have or take on, and the role of broader social structures and relationships is downplayed. The point is that it is not the act of profiling *per se* that is the problem; rather, it is the problematic assumptions behind certain sorts of profiling. However, I should add that in contemporary society, whilst there are of course structures of social and political power in place, these are maybe not linked to a person's *identity* in the way they were in the past. For example, Foucault analyses repressive Victorian mores concerning sexuality, especially that of women, which was systematically denied by society. Likewise, the above example trades on the way in which women were barred from social and public life throughout the course of history and up to the turn of the twentieth century. However, it would not perhaps be accurate to say that those who fought for their freedom were 'resisting the profile', so much as challenging systematic biases reflected in social institutions and so on in society – i.e. winning the right to vote, and the right to have a job. It is not obvious how these sorts of freedoms are on a par with the understandable desire to not be patronised by others. I raise this issue to point out that the notion of *profiling* is one that has only emerged and been given credence in contemporary times precisely because people's identities are more fluid and free in contemporary societies. This is a good thing.

I can now engage more with the view of de Vries and Hildebrandt (2008), who contend, following Varela (1999), that profiling technologies are "of little help" when Foucault's project of creating a *freer* person through engagement with technologies of the self is considered, since self-transformation would require "*more* internalised anticipation" or second-to-second awareness of the virtual nature of ourselves (de Vries and Hildebrandt, 2008:24). I argue that it is not obvious what *more* internalised anticipation either entails or implies *less* freedom. Rather, the development of human technology-use over time, or history, can be understood as being characterised by a *growing awareness* of the way in which our identities are co-constituted by these technologies, and hence, a development of both the need and our ability to 'anticipate' the way in which people must engage with those technologies. On this reading, whilst there is something distinctively new of type in profiling machines and ambient intelligence, this is not to say that one needs embrace pessimistic conclusions.

5.6 Reference groups

I move now to consider the concept of *reference groups*, and how, coupled with our investigation of identity and profiling so far, it can be employed to explore in more detail the 'co-constitutive' nature of ambient intelligence specifically. More generally:

> The concept of "reference groups" has always been central in interactionist theory, although it did not gain currency among social psychologists until Herbert Hyman used the term in a study published in 1942. It refers to the sources of values selected by an individual for the guidance of his behavior, especially in cases when a choice has to be made. Reference groups may be groups of which the individual is a member, but sometimes they may not. In all cases they provide direction for the behavior of the individual concerned, and so constitute important sources of social control. (Shibutani, 1962:1).

From this brief introduction, it can be seen that *reference groups* bear many similarities to the idea of the *stereotype* or *profile*, and are explicitly linked to the idea of 'providing

direction' for the individual, and hence offering a method of 'social control' for other groups or powers within any given society. There is an important dimension of *reference groups* which can also be associated with the idea of *culture*, which can be defined as a shared perspective that members of any particular group take, and in certain kinds of conventional understandings of the way that things are. Hence, people who are in the same reference group will tend to 'see' things in the same way, in the sense that they will 'define a situation' in the same kind of way, and also to see the same possible fields of action. Further, what one *expects* or *anticipates* as being possible features of situations, fields of action, responses to particular actions and so on, "rests to a surprising extent upon expectations formed while participating in groups" (Shibutani, 1962:1). In turn, this means that significantly new experiences, encounters or pieces of information – from learning one will die in a few months to moving to new city – often lead to people seeing familiar things in very different ways.

For Mead (1959), people are able to engage in shared activity because each person takes on the role of the *generalized other* for the others. This means that each person forms judgments and rules governing action by a 'taking on' of the standpoint he sees as being shared by all of the others, which allows him to conduct himself in a way acceptable to the others: "each socialized person, then, is a society in miniature" (Shibutani, 1962:2). This means that a person delineates her- or himself and various kinds of acceptable behaviour *with reference to* a shared perspective.

Hence, reference groups can be redefined more precisely as: that group whose presumed perspective is used by an actor as the frame of reference in the organization of his perceptual field (Shibutani, 1962:3). This does not entail that only particular kinds of organized groups can play the role of reference groups. A reference group could be one person, for instance, as long as that person plays the part of an audience, who is assumed to have certain values or expectations, which the actor seeks to meet. For Shibutani (1962), *reference groups* were becoming a distinctive object of study in the 1960s because of the agreement among many scholars that mass societies (societies of the 1960s) are pluralistic, with decentralized social control, often 'held together' by personal

connections and moral obligations arising out of particular transactions or contexts. The condition of modern society is where people are members of many different social groupings at the same time. Each of these diverse social groups plays the role of a reference group in the form of a 'partial generalized other':

> Most people live more or less compartmentalized lives, shifting from one social world to another as they participate in a succession of transactions. In each world their roles are different, their relations to other participants are different, and they reveal a different facet of their personalities. Men have become so accustomed to this mode of life that they manage to conceive themselves as reasonably consistent human beings in spite of this segmentalization…(Shibutani, 1955:567)

The consequence of living 'compartmentalized lives' means that people are part of a range of different reference groups, unlike, it is implied, in feudal societies where people would have moved within a limited social circle, and be bound by a limited sense of social identity, with a shared religion, set of beliefs about the way the world works, work habits and expectations of behaviour. Today, people's lives are much more fluid, and there are more opportunities for coming into contact with people with both shared and divergent interests, a consequence for Shibutani (1962) of the development of *mass communication* enabled by new technologies.

5.6.1 Ambient Intelligence as reference group

The notion of reference groups is further developed from the *actual* groups of which one is a part, to the *possible* groups of which *one could be* a part:

> T]he concept of reference group points more to a psychological phenomenon than to an objectively existing group of men; it refers to an organization of the actor' s experience.…In this usage a reference group becomes *any collectivity* real or imagined, envied or despised,

> whose perspective is assumed by the actor. (Shibutani, 1955: 563, emphasis added)

A reference group could further be completely imaginary, or it could be '[a]ny group or object' (Shibutani, 1955: 563) that plays a role in creating 'frameworks of meaning' and identities in individuals. Here, there is some similarity with the idea of Foucault's *dispositif* or 'apparatus' into which people enter with particular relationships and which allow them to construct particular identities. It is possible that particular kinds of technology can play the part of a *reference group*, and hence help us to develop our *identities*, when people engage with them in particular ways (Hildebrandt, 2009, Van den Berg, 2009).

This line of argument is one specific development of the theory of reference groups developed by Shibutani (1962), concerning the suggestion that any thing or object can in principle play the role of a reference group for an individual as quoted above. AmI would seem a good example of an object that could play the role of a reference group for an individual insofar as AmI could be *constantly present* and *distinctive* in her or his experience, and significantly AmI would be experienced both as watching and monitoring the individual; and furthermore, AmI would be experienced as evaluating or judging certain kinds of behavior (Van den Berg, 2009). In this sense, it is both possible and meaningful to consider certain types of AmI as playing the role of *reference groups* for individuals in practices of use, which importantly would in turn give rise to particular and distinctive kinds of phenomenological experience, specifically regarding identity.

It is also important to note that the function of reference groups in co-constructing identities of people in everyday life is often a tacit process, which is mostly unremarked and unnoticed – double anticipation - the awareness of being profiled does not need to be conscious awareness (Hildebrandt, 2009). Recalling the goals of algorithmic-profiling I would argue that without users perhaps being aware of the process, these technologies might install a vision of a 'good' life.

This can be taken to imply the need for more discussion within society about the possible uses of AmI technologies, the way in which they can be designed and desirable functions for them in sites of social – and private – practice. Technology has played a mediating role in people's relationship to the world and a mediation role in human identity throughout history; the fact that AmI makes this mediating role more visible and explicit means that it can consequently become an explicit subject of discussion.

What is a further interesting aspect of reference groups is the way in which they are delineated by the possible fields of communication. This suggests that there is a two-way process in the interaction between a person and a reference group:

> Each social world is a universe of regularized mutual response, an arena in which there is some kind of organization that facilitates anticipating the behavior of others. *Each social world, then, is a culture area, the boundaries of which are set neither by territory nor formal group membership, but by* ***the limits of effective communication***. (Shibutani, 1962:5)

What is important here, of course, is the role of *anticipation* of particular responses, which were seen earlier in the discussion concerning Ricoeur and 'ipse'/'idem'. Further, the idea is articulated that there must be 'some kind of organization' that 'facilitates' this anticipation. However, Shibutani (1962) also gives as examples of relationships between a man and an imaginary reference group the idea of the artist working 'for humanity' or philanthropists who give 'for posterity'; this is to pick out the way in which people can be connected to some *not-present* goal, which, in fact, may not be realised within one's lifetime. Further, there are men whose reference groups are in the past, who look back to the 'good old days'. This shows the way in which people can relate *through particular media* to a particular reference group. This might well include various books or manuscripts, or simply, imagination. It is further noted that conflicts can emerge due to a person's relationships with different reference groups with conflicting norms or moral values. This happens in a particularly extreme form when the reference group a person is part of is *marginalized* by the society, and hence that reference group is not *recognized*

by the wider society. This would have some resemblance to what Foucault points to with systematic social discrimination in terms of coercive social expectations, and make good on what were found in the discussion of Ricoeur, that one's identity can also be a locus of resistance.

5.7 Conclusion

In this chapter I have moved from Foucault's idea of *technologies of the self*, through Ricoeur's development of the idea of the 'narrative self' as the locus of mediation of 'idem'- and 'ipse'- identity, touched on the concept of *profiling* and explored how I can understand identity as 'us profiling machines profiling us', and then introduced the concept of *reference groups* to better firm up the social aspect of identity formation in late-modern societies, specifically since the 1960s. The latter point is pivotal in our understanding of the particular function of ambient technologies, not just in personal identity formation, but also in the way that they are able to play a broader social role, and to some extent mediate people's engagement with one another in a shared way. The difficulty with research in this area is that it is speculative at best, since few of these technologies have yet been developed, and none are in place in either an individual's home, or more widely in society.

However, one key philosophical concern is the way in which such technologies seem to blur a number of traditional boundaries. I have explored so far the idea that phenomenology in general attempts to 'break down the boundary' between subject and object. This is given its most elaborate form in the work of Ricoeur, as the idea of the constantly transforming, self-questioning self that happens at the locus of 'idem' and 'ipse' was presented. What is interesting here is the way in which parts of the self are given an 'external' form, for example, not just the diary mentioned by Foucault's *technologies of the self* but a whole range of cultural phenomena, from general works of cultural such as plays, epic poems and great works of opera, but also more mundane things, such as birthday cards, memos, our choice in wallpaper or even things like gravestones and, ultimately, other people too. This is what it means when theorists talk

somewhat cryptically about the way that technology can 'co-constitute' the self. However, technology should be understood also as a *good thing*.

What is also noticeable, on reflection, is the different ways in which a number of theorists strive to understand the same phenomenon: namely, our engagement with technology, the way this changes who we are, and the complexities of *mediation* in this context. In this, it can be seen that a number of theorists assign different types of role to the technology in their rendering of the person-technology relationship: I have argued that technology is a *dispositif*, a kind of facilitator of our *narrative self* and also a *reference group*. It is in the latter guise that the genuine potential of certain types of profiling technologies seems to be most stark. And yet here, the niggling question seems to remain: in what sense are – or *can* – technologies 'replace' the role of other people, actual human beings? Reference groups are ontologically promiscuous, in the sense they are defined functionally and hence their role can be played by groups, individuals, objects or even imaginary entities.

However, what I did not remark on was the way in which all of these things are related – directly or indirectly – to *society*, or even, on some rendering, to *humanity*. Hence, a reference group is what a person uses as a kind of 'audience' or 'marker' for particular expectations, values or concerns. Yet I should bring out the way in which these are *perceived* expectations, values or concerns. The person could always get it 'wrong'; yet, this is does not immediately make sense. The point is seen most clearly when one considers the artist working 'for humanity' – or even, the political campaigner working 'for history'. These are both very abstract 'reference groups', and say as much about the aspirations and beliefs of the actor as they do about whatever humanity or history may want, expect or judge. Hence, a cleavage opens between what reference groups 'actually' expect, and what I 'perceive that they expect'. It is notable that is only in the contemporary age that human beings have the space and material possibility for designing such ambient technologies into which I can enter into such relationships – we have to equip citizens of these modern, technological societies with the ability to understand the mediating roles of technologies around them, and to develop an explicit relation to them.

The final chapter presents and explores the more moral discussion concerning the role of such technologies in our everyday lives, building on these concerns to ask how far these technologies are ‘active’ or ‘passive’ for us, and the way that they might affect our notions of morality, responsibility – and freedom.

Chapter 6: Ambient Persuasion - Designing for Behaviour

> It is not the influencing of behaviour by technology that is immoral, but the refusal to deal with this inevitable influence in a responsible manner. The recoil people often intuitively feel with respect to the influence technology could have on us, must not be allowed to lead to an impotent endeavour to expel all technological influence but can, on the contrary, be used to steer this unavoidable influence in the right direction. (Verbeek, 2009: 8)

6.1 Introduction

This chapter fits into the overall thesis by being the most in-depth exploration of the central claim (C2) concerning how intelligent technologies change the grounds for ethical action and responsibility, as well as exploring the implications of (C1) to this end. In terms of specific objectives, it aims to fulfil PO1: To offer preliminary conceptual guidelines, drawing on the results of TO1-3, that will articulate an ethical framework to be used by the designers of ambient intelligence and persuasive technologies; and to fulfil PO3: To understand how to assign ethical responsibility to humans when their identities and actions are mediated by ambient intelligence and persuasive technologies. The chapter thus explores the various aspects and considerations at play from the point of view of designing intelligent technologies, bringing together the two overall lines – theoretical and practical - of investigation of the thesis.

The chapter begins by considering the way in which the pervasiveness of technology in our everyday lives, coupled with the development of Ambient Intelligence and Persuasive Technology more specifically, has led to the seeming blurring of several traditional boundaries, expressed in conceptual couplings. One such boundary is the traditional dichotomy between objective/subjective, and the related coupling between object/subject. Further, some claim that the boundary between technology/human being has also been 'blurred' with the advent of new technologies. This is an interesting contention, thus I rather present the argument as made by Verbeek (2005) that certain technologies constitute something *radically new* both in the domain of technology, and also for the people who use that technology, and hence for human experience. Verbeek (2005) claims further that this has profound implications for issues of ethics and also for how I *define* the human. I briefly examine the way in which, when considering AmI in particular, there is a tendency to premise either a dystopian or a utopian kind of future, and point out that this is not immediately useful when trying to understand the concrete role of AmI-like technologies in people's everyday experiences today. I also return to Heidegger, his ambivalence about modern technology, and also the way in which for him, as more broadly with most in the phenomenological tradition, that human experience and *being* has been *mediated* by technology since at least the dawn of civilization over 2,500 years ago. Hence, I call into question Verbeek's claim that AmI-like technologies, coupled with the pervasiveness of technologies in contemporary life and people's experiences, means that we have now become 'hybrids' or 'amalgams' of human and technology, in need of a 'posthumanism'. Rather, what it *is* to be human has long since involved a certain degree of *technological mediation*, as I have pointed out in previous chapters. Hence, AmI seems to present no obvious difference on this count. Rather, it is questions of *identity* and of *intimacy* that are of philosophical importance here. Consequently I examine the possible role of AmI in contemporary everyday environments in more detail by considering a concrete example. In the example of the MIT PlaceLab, AmI is presented as a playing a dominantly *disciplining* role in the daily decisions and choices of people.

I begin to raise the question, seen previously in Chapter 2, of whether or not it can be said that some technologies have *intentions*, and if so, in what way this is so.

This leads onto a consideration of the *moral* dimension of people's engagement with technologies. I approach this from two angles. First, I present the view of Verbeek (2005) that technologies can be understood as *moral entities* under some description. I explore how intentions are attributed to technologies as a particular form of *material intentionality*, and then work through one detailed example concerning ultrasound, in an attempt to explore how it is that technological artifacts can come to be implicated in questions of moral-decision making. I then attempt a brief critical engagement with the view that artifacts are implicated in moral decision-making in any particular sense, and suggest that an artifact's designers have part of what I understand as a 'distributed responsibility' for the design of new smart technologies into the future. I then arrive at the second approach.

Dorrestijn (2004) presents a reading of Foucault's *self-practices*, which I draw on alongside other sources. I briefly sketch a useful view of Foucault on the nature of the *subject* in modernity, emphasizing the way in which the subject is understood as a *mediated* being for Foucault, and bringing out the way in which I can read the later Foucault as being in sympathy with Heidegger's views more generally on being-in-the-world and also on human freedom. I look at the way that Foucault opposes morality with ethics, and elucidates instead the importance of an *ethical* self-transformation, or *care of the self, which* involves a kind of freedom of interpretation and bid to self-constitution. Finally, I connect this back to the role of technology in mediating the subject, arguing that there is *hope* that subjects can engage with technologies in a useful and ultimately liberating way.

6.2 Blurring boundaries between machine and human

For Verbeek, Ambient Intelligence (AmI), along with Persuasive Technologies, constitute a "radically new category of technologies," which introduces "novel relationships" between people and technological artifacts (Verbeek, 2005:231). Similarly, a key assumption for this thesis has been that Ambient Intelligence is something fundamentally *different* as a technology from the technologies that have been seen before, and hence presents both an interesting and useful topic of study. There are many examples of the development of this *new* kind of technology today in a number of areas of research; however, it has not yet become a *norm* in everyday life. One difference between Ambient Technology and other technologies, from a design perspective, is that the former has often has been developed by drawing on both technological expertise and work in the behavioural sciences. Therefore, it is frequently designed explicitly to suit specifically human cognitive processes (Verbeek, 2005), and has been termed 'smart'. The fact that smart technology draws heavily in work within the behavioural sciences has also raised the possibility that smart technology could also be designed to deliberately influence human behaviour.

The simplest example of a persuasive technology is a website that gives us information and personalized feedback in order to influence our behavior, for instance, quitnet.com attempts to persuade and help people quit smoking, or in amazon.com, recommendations, reviews, people who bought also bought, or share the love programs try to make us decide to buy more. Another existing example of persuasive technology is a radar gun that displays the current speed of passing cars compared to the speed limit in an attempt to persuade drivers to slow down. In an effort to convince teenagers to exercise more and eventually combat obesity, Cateye developed an exercise bike that connects to any Sony Playstation video game console (Cateye, 2005). [31] The faster the user goes on the bike, the better they perform in the game. Finally, Digital Flowers is an ambient physical interface that takes the form of a plant whose stems and buds represent selected

[31] http://www.heartmonitor.com/cateye/cateye_game_bike_fitness.htm

http://playstudies.wordpress.com/?s=persuasive+mirror

individuals from the user's social network. The straightness of a stem indicates the health of the relationship between the user and the friend corresponding to that stem. An illuminated bud indicates that a call is received.

Further technologies that have been already designed include the *Persuasive Mirror*, to "deform someone's likeness on the basis of his or her lifestyle and recent behaviour as visual feedback of the health risks of the way that person lives their lives" (Verbeek, 2005:232).

For Verbeek (2005) it is right to point out that technologies have always had some influence on people. However, as AmI is a radically new category of technologies, so it has a different *kind* of influence: it is much more subtle, and also has a radically new position in human experience. Often, technology is explicitly designed to influence our behaviour without us even knowing. For Verbeek (2005), as for many other authors, this raises a number of questions concerning control, responsibility and freedom. The question of 'who decides?' is one particularly difficult question to address, as it points the way beyond any narrow academic concern or discussion towards a more public, if not explicitly political, discussion. There is also a question of whether it is right to try explicitly influence a person without them knowing, and a question of whether, and if so how far, the designer of the technology is responsible for the way the technology is used. These are some of the key questions that will concern us over the course of this final chapter.

Ambient Intelligence does not permeate people's everyday lives. Yet what is interesting to note from Verbeek (2005) is the reference to doors that open and shut automatically and fire systems that automatically 'go off' when there is a fire, as something we need only take a "small step" from to get into "more comprehensive environments" (Verbeek, 2005: 233). This might seem to rest uneasily with the earlier claim that AmI is a 'radically new' kind of technology that will be in our everyday lives in 'radically new'

ways. However, it is doubtful that people even notice automatic doors when they enter or leave buildings, far from considering them a coercive influence in their lives. Likewise, fire alarm systems are a normal and accepted part of everyday life that few would consider problematic or philosophically significant. It might be significant that often in the literature, what is considered from a moral and philosophical view is an extreme form of intelligent environment, the AmI house, often added to imaginatively.

There is a tendency to let imaginations run wild when considering the potential of AmI. This reflects the tendency in the literature to sometimes flit from 'dystopian' scenarios of complete human subjection to an increasingly despotic technology on the one hand, to a kind of technotopia of perfection and harmonious living on the other. This is a heavily mediated expression of the ambivalence towards both modernity and modern technology that was first seen in Heidegger. Obviously, these are used as extreme cases to make certain kinds of point and test moral intuitions; however, they are not always the more useful way to think more systematically about the place of technology in contemporary society nor the blurring of boundaries between people and smart things.

The *blurring boundaries* between people and things are one key concern raised by Verbeek (2005):

> On the one hand, technological environments respond to people with a form of intelligence that is usually only ascribed to people; on the other, these technologies have such a profound influence on human actions that the question looms of who or what is ultimately the actor here. Although people are generally seen as active and intentional, and things as inanimate and mute, new technologies seem to urge us to cross this boundary. After all, these technologies take decisions, respond to their environments and interfere intensively with our behaviour. (Verbeek, 2009:234) [32]

[32] Verbeek Peter-Paul (2009). Ambient Intelligence and Persuasive Technology: The Blurring Boundaries Between Human and Technology. Nanoethics 3 (3):231-242.

This is a dense argument packed into a short few paragraphs. However, there are a number of assumptions that must be substantiated if the conclusions are to follow through. First, it is not obvious that AmI technologies, even when I imagine things like the urine-testing toilet or even the coffee machine that knows my drinking habits and so starts making me a double espresso with sugar before I wake up on Wednesday, or even, that can download data about my blood sugar levels and hence anticipate that I will need a coffee before I know I do, that with these technologies that might be understood them as having 'human' intelligence. Why would being able to respond to either of these situations be a peculiarly *human* ability? Further, why could a specifically *machine* intelligence not be attributed to *machines* which seem to have some sort of level of 'intelligence'? It may be that somebody who knows me well knows what I drink on a Wednesday rather than a Tuesday morning, or that they can 'tell' I'm feeling a little tired so will reach for the espresso mug. However, in the case of the AmI coffee machine, importantly I *know* that it is a machine. I might think, 'Oh, what a clever machine, I wonder how it works?' but I would probably not think, 'That coffee machine is behaving like my mum when I was little, how much like a person it is.' This is precisely because I relate to it *qua* coffee machine, *as* a piece of technology. A similar thing seems to be happening with the automatic doors - they are doors - that is what they do. Few people have had the benefit of having a person designated to them to make them coffee all day long and open all their doors for them, so comparing technologies which do these things to 'people' might not be the first comparison that springs to mind.

Hence, it seems that some other belief must be in place for us to think of AmI as 'being human' in some way. Earlier, this thesis explored the causal assumption that machines were 'human' in the case of certain computer programs designed to act or digitally communicate like human beings, or particular leisure technologies designed to elicit responses as if those technologies were alive. However, it does not seem necessarily to be the case that AmI needs to emulate such 'human' qualities, or try to *make* its users conceive it as humans by doing things that humans do. Further, in many ways, AmI functions in ways that it might be said *only* technology can do. For example, even somebody very close to me might not always know my mood, as I could be hiding it; on

the contrary, if it is assumed that my mood can be given from particular kinds of electronic signals from my brain, then the technology could *know* my mood in a way that it is doubtful another person can. It is this particular function of AmI technologies that this thesis finds philosophically significant, as it seems to raise questions concerning the nature of our *intimacy* with AmI, which is of necessity different from the kind of intimacy we might have with other human beings.

Verbeek (2005), too, raises the question of 'humanity' and technology, specifically with reference to the idea of 'taming' the human. This 'taming' effect "takes place with the aid of technology" and "embodies another form of posthumanism than breeding" (Verbeek, 2005:235). This *taming* concerns the shaping or cultivating of human action, and for Verbeek (2005) certain kinds of technology can help to shape the intentions of people, and hence play a role in taming human action. So, if a person uses the *Persuasive Mirror* and on the basis of their experience chooses to give up smoking and go jogging every morning, then not just has the *Mirror* shaped that person's actions, but it has also shaped their actions in a way that would have been impossible without that technology. Hence, AmI "are not neutral instruments or intermediaries but active mediators of relationships between people and reality" (Verbeek, 2005: 235).

First, as was seen from Heidegger that all kinds of tools shape our relationship with reality in particular ways – or *reveal* the world in different ways – and hence that they help to shape us, our being-in-the-world or *essence* in ways that it would not have been otherwise. This idea of the mediating role of technologies in both our relationship with the world and our construction of *self* – even for Ihde our perceptual experience of reality – has been premised throughout this thesis. In a broad sense, this could be understood as technologies being *active* in the shaping of our lifeworld and in our very being or identity 'all the way down', as it were. So, in what particular kind of way does an AmI-based technology like a *Persuasive Mirror* play a different role compared to these other technologies?

The answer would seem to lie in the way that these technologies are "tailor made" (Verbeek, 2005:235) with the specific aim of influencing people's intentions in particular ways. This issue will become increasingly important in the context of smart technologies and will be explored in the next section by looking at the example of the 'smart house'.

6.2.1 The smart house: the modernist impulse

We can rather understand the development of the 'smart house' as mentioned in the first chapters of this thesis, not from the point of view of dystopian/utopian perspectives, but rather a particularly mid-century and American dynamic: "the smart house concept is therefore born from the convergence of blooming domestic technologies in the twentieth century, the modernist progressive mentality, dreams of total control and rationalization through technology," which also has a kind of "aesthetic element" Bounegru (2009:11)[33]. Bounegru (2009) therefore premises the way in which the 'smart house' was supposed to be a liberation, specifically for housewives, from the chores of domestic labour. What is further interesting about the development of the concept is how it *sits* with other developments in and ideas about technology, and ultimately, has shared their fate: "the smart house or the house of the future was, along with other modernist dreams such as the colonizing of space, repeatedly a failed technology in terms of total automation of the house across the twentieth century" (Bounegru, 2009:12). Important here is Bounegru's (2009) explicit linking of smart technology with a modernist project – rarely remarked upon in the literature – but an important step in contextualizing some of the more difficult debates concerning power and control when people inhabit smart technology or AmI environments. Hence, Bounegru (2009) reconnects us to the way in which the *ideas* that drove the notion of smart technology were not a product of mere business on the one hand, and Governments on the other (as I have remarked seems the case today), but rather, of a particular intellectual, moral and aesthetic orientation towards the future. This was a time of great optimism about the liberating potential of technologies, in early 1920s

[33] Bounegru, L. (2009). Smart Houses. Masterthesis, University of Amsterdam. August 23, 2009.

and 1930s America (we saw the downbeat mood of Heidegger's war-ridden Europe at this time); for example, Bounegru (2009) notes that the first 'smart houses' to be shown to the public included built-in washing machines, automatic garage doors and an airport hanger on the side, since people assumed that in the near future every household would have an airplane. Hence, the development of smart technologies can be situated in a climate of *Modernism*, which also existed in limited forms in Europe during this period, but which always remained a minority set of pursuits. Regardless, what is important to note is the way in which one of the central tenants of Modernism concerns the *individual* and their general development and liberation.

This underpins the way in which, today, it is useful to consider the underlying approach to AmI taken by those who pioneer and design it. This is because, whilst AmI can be understood as the development of isolated pieces of technology to fulfill specific aims in people's everyday lives, there is also a way in which we can consider the sort of *world* that people can intend to create with this technology. More generally, AmI technologies can be said to aim to create – as this thesis suggests – a set of circumstances where human agency, judgement and freedom are progressively supplanted with external, frequently algorithmically-applied, standards and norms. This could be understood as the *externalizing* or *outsourcing* of human decision-making processes and practices. For example, the automatic door can be said to *externalize* the social standard that one opens a door to go through it, and then closes the door afterwards. Understood in this basic way, we can begin to appreciate the liberating potential of a *world* of AmI in the future. One particular area in which development work has been carried out concerns physical and mental health. For example, the PlaceLab [34], encourages what can be understood as 'proactive healthcare' - the intelligent technological agents function as disciplinary apparatuses which display statistical knowledge about behaviour, consumption and health patterns, establish routines, suggest and encourage healthy behaviours in terms of diets, exercising and medication. Here, the AmI technology plays a central role as *regulator*.

[34] PlaceLab. Massachusetts Institute of Technology. 14 April 2010.
<http://architecture.mit.edu/house_n/documents/PlaceLab.pdf>

Significantly, the particular areas of human behaviour to be regulated pertain to those areas that particular people want or need regulation. Hence, this is often understood relative to the lives of the more elderly generation. However, there is also an underlying sense of what *kind of world* the developers of particular AmI scenarios want to create, which can be understood in some way to be a continuance of the Modernist impulse. So:

> The regulation of conduct becomes a matter of each individual's desire to govern their own conduct freely in the service of the maximization of a version of their happiness and fulfillment that they take to be their own, but such lifestyle maximization entails a relation to authority in the very moment as it pronounces itself the outcome of free choice. (Rose, 2006:58-9)

The important point raised by Rose (2006) above is the way that AmI *qua* regulator can be said to have an important 'relation to authority', both in its existence in that specific form and in its use for some aim or other by an actor in a particular context. However, the creation and sustenance of this authority over time is further understood as being in the 'same moment' as the 'outcome of free choice', in the sense that there is no dystopian power 'forcing' individuals to take particular actions - though one could also refer to Foucault's point that power can only be exercised over free agents (see Chapter 5). Further, it must be noted that such technologies would not be developed if there weren't some use for them in the wider society; hence, there is in a wider sense a social basis for the 'authority' that AmI might draw on to fulfill their aims. However, it should also be noted that the focus on improving health particularly is itself an outcome of a particularly contemporary concern with pursuing a 'healthy lifestyle'. This might account for some of the resistance to certain AmI 'visions'. The MIT PlaceLab is one such scenario, and describes a house which supports the 'proactive healthcare' mentioned above, which is designed specifically for the aging population. The worry here, of course, is that this might suggest that the private homes of elderly citizens become places primarily for monitoring, regulating and improving health, rather than for living *per se* precisely because these needs are taken care of, being outsourced to the technology embedded in

the external environment. Yet the idea that a person might spend their later years in a space entirely orientated around the monitoring and upkeep of their health might be exactly why some might choose to stay in their own homes rather than move to nursing homes or even hospitals. Thus, it would make sense to develop an AmI environment that is as unobtrusive as possible, and which allows for the exercise of *more* autonomy and freedom of activity in private homes. By unpacking the details of the MIT place lab I hope to now shed light on these related visions.

6.2.2 The PlaceLab

It is possible to examine the possible role of AmI in contemporary everyday environments in more detail by considering a concrete example. In the following example, AmI is presented as a playing a dominantly *disciplining* role (Bounegru, 2009) in the daily decisions and choices of people. Insofar as it can play this role, it is significant that AmI is currently being developed to function in specifically domestic environments, which therefore exist predominantly in the private sphere as opposed to the public. In this very general sense, the development of particular types of AmI follows the development of earlier responsive 'AmI-type' devices developed in America with the birth of modernity at the beginning to mid twentieth century, such as washing machines and automatic garage doors, which were aimed at improving people's domestic existences and freeing up their time. As a preliminary observation, it can be seen that on this view, it can safely be assumed that there is a conscious decision made by the home owners to bring AmI into the home, and that this is further understood as a positive, if not progressive, development. Now it would seem that there is a stronger potential market for domestic AmI devices. When considering the often 'kneejerk' critical change that AmI has somehow imposed on people without their consent, and quickly controls them, the Place Lab is a functioning example of philosophical and moral investigation.

http://playstudies.wordpress.com/?s=house_n

http://playstudies.wordpress.com/?s=placelab

A research group within the Massachusetts Institution for Technology's (MIT) Department of Architecture is responsible for developing AmI that might function in a domestic environment. The specific example of their work that will be considered can be understood as following the example of the 'smart house' developed by the commercial company Philips in the 1990s (see Chapter 1). Indeed, following the commercial interest in developing such intelligent technological devices for domestic environments, there are both academic and commercial interests that fund the project. The house that has been developed by the MIT research group is named 'House_n' , or in its early design stage, the 'MIT Home of the Future Consortium'.

One particular, more domestic, aspect of the house_n project is called 'The PlaceLab' . The reflection of both academic and commercial interests in developing specifically domestic intelligent technology is reflected in the fact that is a joint initiative, funded between the MIT and the commercial technology company, TIAX LLC (MIT, 2011). The PlaceLab is defined by its designers and researchers as: "a residential condominium in Cambridge, Massachusetts, designed to be a highly flexible and multi-disciplinary observational research facility for the scientific study of people and their interaction patterns with new technologies and home environments" (MIT, 2011).

"The PlaceLab is a new kind of scientific instrument - a 'microscope' to carefully study people and their interaction with new technologies in a living environment," said William J. Mitchell, dean of MIT's School of Architecture and Planning, "with the extraordinary pace of technological development, and with the potential for innovations to dramatically improve people's lives, it's essential that researchers better understand how to design systems that people will want to bring into their homes." [35]

[35] http://www.tiaxllc.com/2003/06/mit-and-tiax-create-a-living-laboratory-to-study-human-behavior-in-the-home/ Last accessed April 20th, 2010

Not far located from the MIT campus, the PlaceLab is situated in a 1,000-square-foot apartment equipped with more than 250 sensors and a huge number of cameras and microphones. This 'living laboratory' combines the possibilities of a highly instrumented research lab with the natural environment of a home and allows researchers to move from lab prototypes to testing and evaluating systems with real people - volunteers participating in experiments - in an actual home environment over a longer period.

Kenan E. Sahin, president and founder of TIAX presents the PlaceLab as a new model of collaboration between academia and industry: "Rather than a showcase for new technologies, the PlaceLab is a living laboratory where scientists can work with industry to develop products that enhance functions of a home. At the PlaceLab, we plan to foster greater collaboration between the academic and business worlds to help ensure that innovative ideas and products go beyond where traditional lab research often ends."[36] Involved corporate sponsors include Motorola, State Farm Insurance, British Telecom, Hewlett-Packard, Samsung and SRP, the academic partners include experts from the world-class Boston teaching hospitals and the Harvard School of Public Health.

From the descriptions above, it can be seen that what is important to the researchers are the 'interaction patterns' between new technologies and domestic environments in particular. Their work therefore is highly relevant to the aim of examining in more detail the different relations of mediation that might arise between people and AmI technology.

The PlaceLab is related to a particular area of development of AmI, specifically with regard to Persuasive Technologies, to the area of healthcare. Here the technologies are developed that aim to both support and encourage the well-being of the individual. This can range from attempting to help the individual to make what are considered more healthy, rather than less healthy, choices – in particular regarding exercise, food and drink consumption and also the taking of medication. In this role, the AmI would in principle be of benefit to first those who wish to encourage themselves to make what are

[36] http://www.tiaxllc.com/2003/06/mit-and-tiax-create-a-living-laboratory-to-study-human-behavior-in-the-home/ Last accessed April 20th, 2010

considered more healthy choices in particular areas of their lives, such as exercise and eating habits, and second, to those who might need to be reminded or encouraged to take specific medication regularly. The first type of healthcare mostly concerns lifestyle as opposed to 'health' in the medical sense – although could in practice cover those with particular medical eating and exercise requirements, such as those recovering from illness or for instance those with diabetes. The second type of healthcare concerns those people with specific medical conditions that need regular attention. Hence, the particular technologies present in the PlaceLab conduct both general monitoring of the general physical state of the inhabitant, and, when functioning with biometric devices worn by individuals, to conduct more specific types of monitoring, and further be able to perform electro-cardiology, pulse oximetry, respiratory ausculation, blood pressure and weight and blood sugar levels identification. In these roles, the technologies are not designed to be used by medical experts, but to both work on their own and be able to be engaged with by the individuals who use them.

The use of technologies in the PlaceLab that are related to health can therefore be understood as both monitoring the physical state of the house's inhabitants in specific ways, and also intervening in particular instances when this is required, for example, in terms of encouraging a person to take their medication at the correct time. This can be seen to relate to two broadly different types of relationship that are possible for individuals to enter into with the technology: on the one hand, the technology works in a tacit way; on the other hand, its function is to be *not* tacit. In turn, in the first place, people may in principle be able to stop being aware of the presence of the technology; in the second case, the technology is only functioning correctly when it is recognized by people as functioning.

This further relates to what could be argued to be a shift in the way in which AmI is designed to function in the contemporary domestic environment, for instance in the example of the PlaceLab, compared with the initial impulse behind the kinds of automated technologies developed to function in earlier ideals of what might constitute the 'automated home'. As was mentioned at the beginning of this section, a driving

impulse behind the early development of automated technologies in the early to mid twentieth century, particularly in America, was to design technologies that took over tasks that previously had to be completed by people. Within the domestic environment, this rested on a view that labour in the home was ultimately a waste of people's time, that impeded them being able to pursue their own projects. This was seen particularly starkly in considering the domestic work of the housewife. Hence, it was morally desirable to automate as far as possible domestic tasks, especially those concerning washing, cleaning and cooking. However, the thrust behind the automation seen in the PlaceLab is not necessarily concerning the automation of particular domestic tasks. In fact, it might seem that today, there is a sense that there is 'nowhere left to go' beyond the washing machine and tumble dryer, the vacuum cleaner and the microwave. On this reading, it is not so much the case that the automatic technology we have for completing domestic labour is fully automating domestic tasks, since washing machines still must be filled and emptied whilst vacuum cleaners must be plugged in and used, but rather that there is not a particularly strong sense of needing to fully automate these kinds of domestic tasks. In fact, it might seem that it is more common to think that these labour-saving domestic technologies are making people lazy.

Therefore, the creators of the PlaceLab do not aim to continue these tendencies of the past. As Larson (2000) points out, "20th century homes were doomed because they were 'single purpose structures with a single form driven by one ideology' that was forced on residents."[37] The PlaceLab is different, he claims, "this environment 'is infinitely adaptable'; in other words, it is able to evolve the systems to meet different dwellers' needs. And because it is made with the baby-boomer market in mind, the house is meant to evolve with the residents' aging process. It becomes *a companion of sorts*" (Larson, cited in Hull, 2002).

In this regard, as Larson (2000) further states, "while historically the idea of 'home' has been rooted in one's social relation with things (home décor is meant to reflect one's personal style or position), the smart house takes this to its logical extreme; humans now

[37] Larson, Kent. ' The Home of the Future,' *A+U 361*, October 2000: 5

imprint their code on their things to the degree that things become more like the people who own them."[38] Stephen Intille also contrasts the PlaceLab with its predecessors, and claims:

> "The popular vision of the house of the future is where you hardly have to get up from your easy chair. That's not ours at all. We want the house to enable you to lead a more active and richer life – and encourage you to do things, not to have them done for you" (Intille, cited in Hull, 2002).

Consequently, the integrated intelligent systems of the PlaceLab produce an ongoing stream of activity, and from this point of view the project can be seen as designed to replace an former understanding of robotics that rendered humans passive. (Intille, 2002)

Indeed, whereas Jean Baudrillard (1987) and Paul Virilio (1989, 1997) have argued that "audiovisual media and telerobotics have made bodies to be 'superfluous', 'disabled', and sedentary" (Virilio, 1989: 119), todays smart home engineers promote the contrary - inside the PlaceLab social ills are remedied by technologies that keep us active.

In this way, the view of Stephen Intille is indicative: as opposed to freeing up people's time to be spent as they please, contemporary AmI technology should instead "require human effort in ways that keep life as mentally and physically challenging as possible as people age" (Intille 2002: 80)[39]. Here, it is possible to see that the development of intelligent technologies to be used in the home have become explicitly linked to supporting elderly populations. In this sense, especially when linked to the idea of keeping older people as healthy as possible, the role of the intelligent technology shifts, becoming one of supporting, encouraging and monitoring the individual. Furthermore, on the basis of this shift, the overall purpose of AmI for all domestic use also shifts, such that its aim should become to aid people to "live long and healthy lives in their homes, reduce resource consumption, and integrate learning in to their everyday activity into

[38] ibidem

[39] S. S. Intille, ' Designing a Home of the Future,' *IEEE Pervasive Computing*, vol. April-June 2002. p. 80

their home" (Intille, 2002:80).[40] Here, the function of intelligent technology in the domestic environment seems almost unrecognizable compared to its desired function in the early to mid twentieth century home. In the latter, the technology was supposed to free up people's time in general to do what they wanted to do; now, the technology is supposed to fulfil specific aims regarding individuals, significantly encouraging them to behave and develop in particular ways.

On the one hand, the technology liberates the individual to determine their own lives in the way they see fit; on the other, the technology actively facilitates the development of the individual in particular ways, even going so far as to encourage them to eat and exercise in particular ways, to ensure they do not use too many resources and to learn at home. This shift is significant, and should be explored in more detail. It implies that the 'smart house' could become seen as a 'disciplinary agent', where intelligent technology encourages specific kinds of behaviours regarding diet, exercise and medication.

However, the idea of the 'smart house' of the twenty-first century as being able to 'look after' elderly people in particular is often the dominant function given to smart technology in a domestic setting in the literature. In part, this is a consequence of the fact that smart technology itself is being developed specifically to help those of older generations. However, it is significant that this is one of the main areas of development of smart technology in contemporary society in the first place, and that further, it is from the perspective of helping the elderly that domestic smart technology is often defended. Hence, smart technology that can help the older generations, the ill and the frail to better look after themselves is often seen to encourage and facilitate greater self-sufficiency on the part of those generations. In this way, smart technology can monitor and can respond to older, more fragile individuals. This could be useful in noticing potential health problems before they emerge, issuing reminders to take medication or attend appointments, and a whole range of other possible functions. In this sense, it is possible to understand that smart technologies try to *persuade* people to become more disciplined, and in so doing, to attempt to discipline the mind. (Bounegru, 2009)

[40] Ibidem

The idea that smart technology is or even should be primarily *persuasive* is a theme throughout the literature. For example, one research project (MIT, 2009) is named the "Just-In-Time Persuasive User Interfaces for Motivating Healthy Behaviours." [41] The project aims to develop smart technologies which are sensor-equipped, and aim to increase self-healthcare awareness and to "motivate behaviour change in fun, educational, non-irritating ways over very long periods of time." [42] Here, the idea of the smart technology as persuading people to change the way that they behave is introduced. It would seem interesting that the technology is described as working in a 'non-irritating' way, as this suggests it should be seen as a helpful friend. For example, one such device is called *ViTo*: a PDA which is a remote control for home entertainment systems, and also aims to decrease sedentary activity: "The interface of this device […] is designed in such a way that it may unobtrusively promote a reduction in the user' s television viewing while encouraging an increase in the frequency and quantity of nonsedentary activities." [43] It could thus be said to aim to *manage* human activity within the home. In this instance, it is unclear how far there is a demand for technologies that can manage a person's own behaviour in the domestic environment, and how far there has been a shift in the design aim of such technologies since the past. Nevertheless, there does seem to be a shift in the perceived function of smart technology in the domestic environment: away from taking over domestic labour to free up the time of the home's occupants, towards explicitly engaging with and attempting to manage and change the behaviour of the home's occupants in specific kinds of ways, and encourage specific forms of behaviour.

In this sense, the smart technologies developed within the PlaceLab and other projects, are based on the assumption of a particular kind of person with a particular kind of lifestyle and aims at living within the home. The user of smart domestic devices imagined by the PlaceLab is *active* in their domestic environment, supposed to respond responsibly to suggestions from the technology, and to be able to take responsibility for the maintenance of their own healthcare and proactively strive to improve their eating and

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[41] House_n Projects. MIT. 4 June 2009. <http://architecture.mit.edu/house_n/projects.html>

[42] Ibidem.

[43] Nawyn, Jason , Stephen S. Intille, and Kent Larson. ' Embedding Behavior Modification Strategies into a Consumer Electronic Device: A Case Study.' *UbiComp 2006: Ubiquitous Computing* (2006), p. 297

exercise habits, and how they use their spare time. In this sense, it is interesting to note that, whilst there seems to be a significant shift in the aim of domestic smart technology as compared with the aim articulated by modernism, that there is also a resurgence of the very modernist idea that, for example, new kinds of buildings should encourage particular kinds of activity and behaviour through their design, for example, that people are 'more public' and more active and self-aware in their daily activities in the home. Despite the obvious differences between early twentieth and early twenty-first century America, and the differences between the development of contemporary smart technology compared with the modernist labour-saving devices, there is nevertheless some similarity in the general idea that technology can help to shape people's behaviours and lifestyles in quite specific kinds of ways. However, it is difficult to discern behind the PlaceLab the same sort of broader vision or impulse that drove Modernism as an artistic, philosophical and political idea. Hence, it might seem right to say that specific domestic labour-saving devices in the past classically aimed to free up people's time from time-consuming tasks; whereas today they are developed to influence behaviour in specific ways for specific ends. However, the broader aim of Modernism, in a perhaps more extreme form than tended to enter commercial companies – so for example, the radically egalitarian architectural Modernism of the sort that built the Vienna subway system, with an entrance also built for the monarch, who was expected to use the same transport as everybody else, or the buildings of Le Corbusier that aimed to open up public spaces in domestic living areas and attempt to make in some way more rational and self-disciplined citizens – sees in a very different form an expression in the idea that contemporary smart technologies should influence and shape behaviour. However, the difference here is that smart technologies today would seem to be aimed at isolated individuals, and to function to improve the health and the habits of those individuals on a personal level, rather than being connected to any broader kind of egalitarian social or political agenda.

However, it could also be noted that the focus of these persuasive technologies is "to *teach* as opposed to using technology primarily for automated control"[44] which means placing the technologies so that they function as an *authority* in relation to the inhabitants of the house. Further, these technologies would, in the long-term, make life 'easier' for the people living in the house. One could argue in response that there is something patronising in the assumption that people should be 'taught' in their own homes by technologies; on the other hand, it could also be argued that technologies could play a useful role helping people to improve themselves, and this may be something that people would like to do. This is one expression of the classic ambivalence often displayed in response to modern technologies. Yet further, some argue that the sorts of technologies in house_n are still forms of domination over individuals, only that the focus of government has now shifted from "the outside (e.g., from law and the forceful disciplining of the body) to the inside (e.g., the disciplining and cultivation of the mind), as older disciplinary regimes were either supplemented or replaced by a biopolitics of population and by technologies of the self" (Nadesan, 2008:91). This view is obviously influenced by the concerns of Foucault regarding technologies and social power, which we have met in Chapter 5 of this thesis. It is helpful to locate the discussion about house_n in the contemporary social and political climate, as opposed to the social and political climate of over a century ago. Yet, it would seem premature to argue that all such technologies must *ipso facto* function as agents of Government domination of the individual. Nevertheless, the view is also helpful in pointing out what we have noted: that a certain idea of who the individual should be lies behind much of the smart technology. For example, this individual should not waste energy, eat badly or exercise insufficiently; this represents a shaping of the individual in terms of behaviours, and perhaps also in the long-term, also in terms of values and aims. Further, the individual is supposed to eventually govern himself and become responsible in the above areas, but is also considered to be incapable of doing so without the aim of technology. (Bounegru, 2009) This concerns the charge of patronisation that was outlined above.

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[44] Intille, Stephen S. ' The Goal: Smart People, Not Smart Homes.' *Smart homes and beyond: ICOST 2006 : 4th International Conference on Smart Homes and Health Telematics*. Eds. Chris D. Nugent, Juan Carlos Augusto. IOS Press, 2006. p. 3

This discussion points to a more sensitive reading of why particular kinds of smart technologies are being developed in house_n in particular, and in the wider society more generally. Is it desirable to develop domestic smart technologies that help to reduce energy consumption, or are there other kinds of domestic functions that smart technologies could play? How far is the Government interested in developing technologies that help citizens to not eat unhealthily, and how far is business interested in developing such technologies because they judge there would be a real demand for it in society? Finally, it would seem that there is an arguably very narrow scope given to the possible development of different kinds of smart technologies to be used in the home.

6.2.3 Mediating subjectivity

The above section has sketched in some detail the types of domestic smart technologies currently in development. What the discussion has showed is that there is a kind of *ambivalence* about domestic smart technologies in contemporary society, specifically regarding how far they can be said to either control, or to liberate the individual. The PlaceLab has been presented as a *disciplining agent*, and the idea that this means being able to better *manage* individual behaviour in the home has been initially presented. This section turns to these latter themes in more detail.

Some understanding of how these smart technologies work is important for the remaining parts of this thesis. The technologies monitor people's behaviour over periods of time, collecting various kinds of data about their activities. This data is then processed by a range of algorithms, in particular those able to spot particular types of regular or habitual behaviour. Through using these algorithms, pertaining to such 'pattern recognition', AmI can create a 'smart profile' about each individual in the house. This rests on the assumption of those individuals engaging in regular and patterned behaviour over the space of, for example, a day or a week or a month. Finally, the smart profile then facilitates – or could be said to *mediate* – the relationship between the smart technology and the inhabitants, insofar is allows for meaningful communication between the two

about the individual's activities. The inhabitant can communicate with the smart technology in a variety of ways, using sensors, spoken voice or by the 'communication' of biometric devices they are wearing, which automatically turns various physical aspects of the individual into data. In this sense, the information flow within the smart house could be said to be 'merged' into one circuit, unlike earlier versions of similar domestic environments or earlier cybernetic technologies. Hence, the individual is placed *into* this circuit, as this circuit exists as a material and virtual structure in the domestic environment. As Lynn Spigel (2005) describes:

> Whereas the old homes of tomorrow imagined a split between mind and body in which the house had what Buckminster Fuller called a 'mechanical core' – a kind of giant brain that transmitted signals to mechanical parts – the smart home's 'integrated systems' are imagined as interrelated organs in a body that adapt to each other's presence as well as to their residents – in N. Katherine Hayles's (1999) terms – these systems are giving information back its body. (Spigel 2005: 410)

A number of authors derive interesting questions concerning the *mediation of human subjectivity* from these reflections. Lynn Spigel terms this form of social interaction 'posthuman domesticity' – by which she means a mode of domestic subjectivity based on the melding of silicon and flesh – a lifestyle where everyday human experience in the smart house is orchestrated by telerobotics and intelligent agents. Here the smart environment is understood as "a sentient space where human subjects and domestic objects speak to one another via intelligent agents and internet connections" (Spigel 2005: 408). In sum, 'posthuman domesticity' describes a movement towards a human-machine collaboration that doesn't delegate work to robots, but instead allows people to work hand-in-hand with them. Also for Agamben this interplay of humans and apparatuses results in processes of subjectivation:

> We have then two great classes: living being (or substances) and apparatuses. And, between these two, a third class, subjects. I call a subject that which results from the relation and, so to speak, from the relentless fight between living beings and apparatuses. (Agamben, 2009:14)

In this sense, the traditional dichotomy between human and technology becomes significantly blurred; not only as the person is more 'integrated' into a material circuitry, but also insofar as the person's *subjectivity* – in terms of both their self-awareness and their *identity* becomes mediated by the smart technology in particular ways.

> It seems to me the question of the self must be posed in terms of the technical and material framework in which I arose. (Foucault 1985: 363)

Furthermore, as mentioned already in Chapter 4, Kent Larson, states that it may become a reality that advanced systems will be self-programming, with the environment *melding* ever more intimately with the individual over time."[45] The idea of self-programming systems raises significant concerns considering not only identity, but also agency. The use of the term *melding* is also significant. The thrust behind this view is that the use of smart technologies in the home environment is *ipso facto* a process of 'loosing control', as the technologies take over increasing decisions about various aspects of the home environment, and so on. In this sense, it can be seen that such technology works on the assumption that human behaviour is disciplined to some extent to start with, that it is patterned and expresses routine.

6.2.4 The technological unconscious

Following on from the above discussion, it can be seen that contemporary smart technologies 'blur the boundaries' – or challenge the traditional dichotomy – between people and technologies, it is possible to explore in more detail the way in which smart technologies raise profound ontological questions about human *agency* in house_n-like environments (Hayles, 2009). For Hayles (2009), this means reconceptualising the meaning of *human subjectivity* in general. Again, the classic ambivalence, control/liberation is raised with regard to domestic AmI environments, such that one must

[45] Larson, Kent. ' The Home of the Future,' *A+U 361*, October 2000: 5

strive to use the “constructive and life-enhancing aspects of these technologies without capitulating to their coercive and exploitive aspects” (Hayles 2009: 48). Here, this ambivalence is expressed with regard to a constructive/coercive pairing, and further linked to the mediation of subjectivity. How far do these technologies mediate subjectivity in a way that is constructive or liberating, and how far do they mediate subjectivity in a way that is controlling or coercive? This question is then shifted and reparsed at the level of design, so that the development of an 'ethics of design' becomes necessary: “the idea that meaning and interpretation can occur across and between human and mechanical phyla contributes to an expanded sense of ethics necessary when the contexts for human action are defined by information-intensive environments and include relational and context-aware technologies” (Hayles 2009: 69). Here, the interpenetration of people and technologies in smart environments is taken to both ground and justify an 'expanded sense of ethics' within the design of smart technologies. However, it is also possible to be critical about the 'point' at which ethics becomes a particular concern in the design of such technologies. For example, this thesis has attempted to argue that it is not the responsibility of particular designers *per se* to design suitably 'moral' or 'ethical' kinds of smart technology. Rather, the thesis has aimed to establish that a complex of factors shape what kinds of technologies are developed, when and how; therefore, it has called for a broader discussion about what kinds of smart technologies could and should be developed for use.

However, Hayles (2009) also suggests that the extent of mediation of human subjectivity by new technologies is so great that it leads to a kind of 'technological unconscious' (Thrift, 2003), which is a consequence of a view that the human unconscious has an historical aspect, which is specifically related to aspects of technology and design. For Thrift (2003) this specific form of 'unconscious' means that the kinds of habits that develop in daily life become 'disciplined' by various technologies. In this sense, there is a mediation of both 'conscious' subjectivity and 'unconscious' (habitual) action by technologies. Hayles writes:

> Thrift uses the term to reference the everyday habits initiated, regulated, and disciplined by multiple strata of technological devices and inventions, ranging from an artifact as ordinary as a wristwatch to the extensive and pervasive effects of smart environments. Implicit in his argument is the idea that both the conscious and unconscious are influenced and shaped by the technological environments with which humans have surrounded themselves as far back as the domestication of fire. The argument suggests that the unconscious has a historical dimension, changing in relation to the artifactual environment with which it interacts. Thrift's vision resonates with recent arguments for thinking of cognition as something that, far from being limited to the neocortex, occurs throughout the body and stretches beyond body boundaries into the environment. (Hayles, 2009)

One interesting part of his argument is the idea that the human unconscious (in terms of habitual, reflex or not directly-aware-to-conscious-mind action) has an historical dimension, and is further mediated by technologies. This would seem to resonate with the argument of this thesis; as it has been argued that human subjectivity and behaviour develops throughout history, and specifically with regard to being mediated by technologies. This idea is also expressed by the anthropologist Hutchins (1996), who defines the concept of an 'extended cognitive system' as something as straightforward as a pair of compasses, a pencil and paper. In this sense, it would seem trivially true that contemporary technologies in general constitute an 'extended cognitive system' of people. In this sense, it can further be argued that human beings have a *natural tendency* to extend their cognitive systems, from prehistoric cave paintings to smart technologies (Clark, 2004). Hence:

> Such technologies, once up and running in the various appliances and institutions that surround us, do far more than merely allow for the external storage and transmission of ideas. They constitute, I want to say, a cascade of 'mindware upgrades' cognitive upheavals in which the effective architecture of the human mind is altered and transformed. (Clark 2003:4)

Here, it can be seen that a more detailed understanding of the extent of technological mediation of the human mind and behaviour is articulated. The relationship between technology and people becomes one of *constituting*, or more accurately, of *co-constituting.* In turn, this allows for cognitive processes, or habitual actions, to *fall below* conscious awareness, because they are achieved either by technology, or 'through' the technology in a way no longer reflected on consciously. In this way, it can be seen that Clark (2003) articulates a more detailed and psychological reading of what was initially Heidegger's idea of a technology being ‘ready-at-hand’.

On this expanded reading (Clark, 2003), it can further be seen that it is code in particular, *qua* scriptural force, that mediates the human individual, and the individual and technology. Moreover, because it has expressive power and is particularly versatile, code is aptly suited for this mediating role. Hence, *pace* Latour, it could be said that human beings begin to play a role in an increasingly developed and complex kind of network. For Hayles (2009), this network, with the dawn of more contemporary smart technologies in particular can be described as a kind of framework, which is “multi-layered, context-aware, and capable of generating novel meanings and interpretations” (Hayles 2009:60). Hence, human meanings become contextualized in a world co-constituted, or shaped, by technologies and more advanced systems do force us to reconsider the various ways in which human experience and cognition, subjectivity and identity, are mediated by these technologies.

It is important to consider how such systems produce, deploy and interpret information about human beings, and their role in profiling human behaviour and using these profiles to interact with individuals. In this sense, it is important to consider more critically the relationships between ideas of 'data', 'meaning' and 'interpretation'. It is relevant to note the way in which information as it flows around different kinds of systems can be said to be *contextual*, in the sense that it is shaped by specific mechanisms of interpretation. If 'interpretation' is defined in a loose way, it can be said that human beings 'interpret' information in specific kinds of ways, but that it is also meaningful to talk about computers, for instance, as 'interpreting' information, too. Hence, it can be said that a

computer 'interprets' information in one particular way when voltage is correlated with binary code, and in another kind of way generates meaning with programs such as C++, which allows people to understand binary code in a way that makes sense to them. Further, MacKay (1969) argues that the information generated by computers is then processed by human cognitive systems of all different types; hence, 'interpretation' is no longer a solely conscious, or self-conscious activity that is specific to human consciousness. In turn, this means that it is possible to *quantify* different types of interpretation, relative to specific contexts. However, it is important to be careful to distinguish different *types* of interpretation and meaning: it is possible to talk generally about the kind of interpretation conducted by computers, but it is also important to capture what is specific about human, conscious interpretation.

More specifically for the argument of this thesis, however, it can be established that especially AmI technologies not only mediate human subjectivity in a *deep* way, but also that, when they play a role in for example a smart house system, that they can also be said to in some way both *interpret* information and to *generate* meanings. This does not preclude giving an account of what makes human consciousness qualitatively distinct as a cognitive process from technologies working to both interpret information and generate meanings within particular contexts. In fact, the latter, where technologies can be said to generate meanings, can be understood as a generalised consequence of the account of technologies *qua* scriptural forces that was developed earlier in the thesis.

Hence, it has been established that meanings are generated in specific contexts, relative to relationships of interpretation that exist between information and smart technologies and human subjects on the one hand, and relationships of mediation that occur between human subjects and smart technologies on the other hand through that information, specifically the *profile* generated by smart technologies. It can therefore be appreciated that the *context* in which meanings are generated is key to 'fixing' the precise meanings that are given to particular kinds of information in particular contexts. This, in turn, as was seen also in the discussion of technologies *qua* scriptural forces, is at root shaped by structures of meaning that are present in *human society*, that shape how we understand

and shape and perceive the world. This again shows the problem inherent in considering smart technologies in a way that isolates them from those wider social frameworks of meaning on the one hand, or that isolates their individual designers from that wider social framework of meaning on the other. It also points the way towards having a more profound discussion about the sorts of frameworks of meanings that are present in contemporary society, and which shape both the meanings of various technologies, and the meanings those technologies could be said to 'generate'. Hence, it can be seen that the smart technology in particular also creates, mediates or arbitrates meanings. Whilst this is in a qualitatively different fashion from human consciousness, or the subjective interpretation of the world, one can nevertheless appreciate the implications this could have for the human individual who inhabits an Ambient Intelligence based world, such as the smart house, regularly and for long periods of time. In this case, the smart technology would become an important part of a distributed system of human cognition, in the same very general way that a pencil and paper could be said to constitute such a system of cognition. Finally, this leaves open the possibility both that smart technologies could be used to coerce human beings, but they could be used to liberate them.

So, one way of understanding the *liberating* potentials of smart technologies is to understand them as a different but ultimately more developed version of earlier types of domestic technologies that aimed to automate particular domestic tasks. On this view, smart technologies can be understood as *outsourcing* particular decision-making processes, and thus, as freeing up space for other kinds of conscious activity emerge. Here, smart technologies allow us to choose what to outsource, so that we do not have to worry about it ourselves. In contrast, one way of understanding in more detail how smart technologies could coerce people further is to concentrate on the way in which they could in principle begin to anticipate particular forms of human behaviour, and thus preclude other forms of behaviour from being able to emerge. On this reading, smart technologies both 'free' the individual to concentrate on other tasks and so on, but do this by explicitly managing human behaviour and structuring it in different kinds of ways.

This allows the introduction of Foucault's notions of the 'technologies of government' *viz.* technologies that can structure, discipline and ultimately govern human behaviour. As Dervin and Abbas (2009: 2) state, these 'technologies', theorized by Michel Foucault, seem to fit well with the investigation of the contemporary 'living webs' (i.e., the internet of things and all the technologies attached to it). Dervin and Abbas (2009) writing on Foucault:

> Without wishing to engage with exaggerated comparison, the link with the possibilities of interpersonal spaces created by web 2.0 and 3.0 technologies is clear, as more and more people (rich and poor, female and male, educated and non-educated…) take care of themselves with these technologies. (Dervin and Abbas, 2009: 2)

Such technologies have *authority*, and both aim to manage and to advise various aspects of people' s lives. Foucault points to the interrelatedness of arrangements of power and subjects and shows how these hybrid relationships of humans and technology shape our mode of existence.

> "I think that if one wants to analyze the genealogy of the subject in Western civilization, he has to take into account not only techniques of domination but also techniques of the self. Let's say: he has to take into account the interaction between those two types of techniques - techniques of domination and techniques of the self. He has to take into account the points where the technologies of domination of individuals over one another have recourse to processes by which the individual acts upon himself. And conversely, he has to take into account the points where the techniques of the self are integrated into structures of coercion or domination. The contact point, where the individuals are driven by others is tied to the way they conduct themselves, is what we can call, I think, government. Governing people, in the broad meaning of the word, governing people is not a way to force people to do what the governor wants; it is always a versatile equilibrium, with complementarity and conflicts between techniques which assure coercion and processes through which the self is constructed or modified by himself." (Foucault, 1993: 203 - 204)

In an interview with Paul Rabinow, Foucault explained his understanding of the term technology within this context:

> (…) what interests me more is to focus on what the Greeks called the tekhn**ē**, that is to say a practical rationality governed by a conscious goal. (…) The disadvantage of this word tekhn**ē**, I realize, is its relation to the word 'technology', which has a very specific meaning. A very narrow meaning is given to 'technology': one thinks of hard technology, the technology of wood, of fire, of electricity. Whereas government is also a function of technology: the government of individuals, the government of souls, the government of the self by the self, the government of families, the government of children and so on. I believe that if one placed the history of architecture back in this general history of tekhn**ē**, in this wide sense of the word, one would have a more interesting guiding concept than by the opposition between the exact sciences and the inexact ones. (Foucault 2000: 364)

In the excerpts above, Foucault defines an approach for a philosophy of technology: the study of hard technologies in relation to technology in the sense of government. This approach aims to reveal the role of (hard) technology for governing and shaping human subjects. (Dorrestijn, 2011) Foucault also points to the potential challenges these relations present to us:

> And we have been able to see what forms of power relation were conveyed by various technologies (**…**). What is at stake, then, is this: How can the growth of capabilities [capacités] be disconnected from the intensification of power relations? (Foucault 2000: 317)

In consequence, in **"**What is Enlightenment?**"**(2000), Foucault goes on to formulate a serious doubt:

> (**…**) if we limit ourselves to this type of always partial and local inquiry or test, do we not run the risk of letting ourselves be determined by more general structures of which we may well not be conscious, and over which we may have no control? (Foucault 2000: 316)

For Foucault (1978), these tendencies are part of a longer historical process. Since the eighteenth century, western societies have been moving from sovereign to disciplinary societies, such that the mechanisms of power change to attempting to discipline the individual and constitute them in particular kinds of ways (Foucault, 1978). Hence: "the old power of death that symbolized sovereign power was now carefully supplanted by the *administration of bodies and the calculated management of life"* (Foucault, 1978:138). Hence, the shift is away from a 'naked' exercise of a sovereign power over its citizens (eg. The power of the death penalty to militate against certain types of action) and towards a power that attempts to manage the life of people in particular ways. The term *biopower* thus refers to the way in which social power becomes internalized by individuals. It becomes therefore, "a form of power that regulates social life from its interior, following it, interpreting it, absorbing it, and rearticulating it. Power can achieve an effective command over the entire life of the population only when it becomes in integral, vital function that every individual embraces and reactivates of his or her accord" (Hardt and Negri, 2000:23-24). Foucault writes on the interplay of arrangements of power, the artifactual environment and individuals:

> Power has its principle not so much in a person as in a certain concerted distribution of bodies, surfaces, lights, gazes; in an arrangement whose internal mechanisms produce the relation in which individuals are caught up. (Foucault 2000: 202)

For Foucault, biopower is a technology of power, which aims to manage people as a group. In his lecture courses on biopower entitled *Security, Territory, Population* at the Collège de France in 1978, Foucault explained this concept as follows:

> By this I mean a number of phenomena that seem to me to be quite significant, namely, the set of mechanisms through which the basic biological features of the human species became the object of a political strategy, of a general strategy of power, or, in other words, how, starting from the 18th century, modern Western societies took on board the fundamental biological fact that human beings are a species. This is what I have called biopower"... (Foucault, 2007: 1)

Further, according to Foucault, *biopolitics* thus emerges also in the eighteenth century, which denotes a specific technology of government capable of exercising *biopower*. In biopolitics human life itself, in the biological sense, has become a central object of science and governance, biopolitics designates what "brought life and its mechanisms into the realm of explicit calculations and made knowledge-power an agent of transformation of human life" (Foucault 1979: 143). Within biopolitics, Foucault distinguishes between two dimensions of this 'power to life', - the disciplining of the *individual body*, on the one hand, and the regulations of the species body - of the *body of the population* - and its goal is to optimize life forces on the other.

> The novel aspect introduced in the analysis of power by the notion of biopolitics is that the latter does not deal with society (as the judicial body defined by law and the contract), nor with the individual-body. What emerges with the introduction of biopower as a practice is the notion of a social body as the object of government. It is the notion of population: biopolitics is concerned with population as a political and scientific problem, as a biological issue of the exercise of power. [46]

Therefore, biopower can be understood as literally having power over *bodies*; "an explosion of numerous and diverse techniques for achieving the subjugations of bodies and the control of populations" (Foucault, 1998: 140). For Foucault, there is an intimate connection between the development of the capitalist society and the growth of biopolitics: "Society's control over individuals was accomplished not only through consciousness or ideology but also in the body and with the body. For capitalist society, it was biopolitics, the biological, the corporal, that mattered more than anything else" (Foucault 2000: 137). Both - human body and populations – share an entanglement with the development of capitalism, which required "the controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes" (Foucault 1978: 141). Life is no longer subordinated to the working process:

[46] http://www.generation-online.org/c/cbiopolitics.htm . Last accessed April 3rd, 2010

"The subjectivity of living labour reveals, simply and directly in the struggle over the senses of language and technology, that when one speaks of a collective means of the constitution of a new world, one is speaking of the connection between the power of life and its political organisation. The political, the social, the economic, and the vital here all dwell together" (Hardt/Negri 2000: 405-6; see also 22-41). In his book, *The Politics of Life Itself,* Nikolas Rose asserts:

> "As human beings come to experience themselves in new ways as biological creatures, as biological selves, their vital existence becomes a focus of government, the target of novel forms of authority and expertise, a highly cathected field for knowledge, an expanding territory for bioeconomic exploitation, an organizing principle of ethics, and the stake in a molecular vital politics." (Rose 2006: 4)

In his lecture course *Society Must Be Defended*, Foucault pointed out the fundamental difference between biopolitics and discipline: "Where discipline is the technology deployed to make individuals behave, to be efficient and productive workers, biopolitics is deployed to manage population; for example, to ensure a healthy workforce". (Foucault 2003: 239-264). Biopolitics is therefore tied to managing in particular areas of health and sanitation: "the endeavour, begun in the eighteenth century, to rationalize the problems presented to governmental practices by the phenomena characteristic of a group of living human beings constituted as a population: health, sanitation, birth-rate, longevity, race" (Foucault, 1997: 73). In truth, these various areas become the preserve of emerging kinds of expert disciplines, such as medicine or education, and governed by the 'disciplinary apparatus' of, for example, the hospital or school. As Dorrestijn (2011) states, the effect of governing and influencing people clearly has become embedded into the material and procedural layout of disciplinary institutions. By the second part of the twentieth century, this has taken the form of neoliberalism:

> The relation between the biological life of the individual and the well being of the collective…is no longer a question of seeking to classify, identify and eliminate or constrain those individuals bearing a defective constitution, or to promote the reproduction of those whose biological

> characteristics are most desirable, in the name of the overall fitness of the population, nation or race. Rather, it consists in a variety of strategies that try to identify, treat, manage or administer those individuals, groups, or localities where risk is seen to be high. (Rose, 2006:7)

Hence, the state now attempts to *manage* individuals, through surveillance and also regulation. It casts itself as a *mediator* of various parts of human life, for example, conducting waste disposal across the whole society, whilst also developing its remit into active health promotion. For Rose (2006), this is also simultaneously a process of developing technologies of the self, where the individual is encouraged to take care of their own health, through being responsible for their own maintenance through the use of particular kinds of technologies. In this sense, biopolitics is also a process of a certain kind of democratization. The management of life thus becomes, "individualized, voluntary, informed, ethical, preventive medicine" (Rose, 2006:3). This fits with the criticisms that have been offered throughout these sections, that smart technologies deal with individuals in particularly *individualized* kind of way. Hence, the house_n project can be understood as being in some way an extenuation of this process of 'democratizing' the exercise of biopower, through biopolitics reconstituting the relationship between citizen and state, and extending 'responsibility' to the individual for administering or managing their own affairs in particular areas, albeit in particular kinds of ways and to specific aims or ends. This might explain why a particular focus of these domestic smart technologies is preventative healthcare, where particular health reports can also automatically be made available to third parties, for example, doctors.

This suggests that there is a limit to self-care through technologies, which reinforces the needs for external sources of expertise. It also suggests a limit to the usage of smart technologies when they function to consolidate biopolitical values in the domestic environment by aiming to manage life itself, whilst simultaneously pointing towards the sheer force that such technologies could have if deployed on a large scale. Such technologies, in a biopolitical climate, would function to subjectify individuals, and delegate particular decisions to the smart technology. This is in stark contrast to the genuinely liberating potential of smart technologies.

6.3. Responsibility

The above statements on persuasive technology raise the moral question of *who* is responsible for new technologies, their effects and their function in both local and global environments when their explicit function is to *persuade* people to think or behave in particular ways. It is not insignificant that this question is being raised increasingly in reference to AmI, as many AmI are designed explicitly to influence people's behaviour in a number of ways, specifically when this takes the form of what have been called Persuasive Technologies. Hence: "persuasion is a value-laden activity. By extension, creating or distributing an interactive technology that attempts to persuade is also value-laden" (Fogg, 1999:144). This is an interesting moral statement. However, what is significant about Fogg's (1999) assertion is that it seems aimed at those involved in creating and distributing contemporary forms of persuasive technologies, and hence attempts to foster a sense of professional 'duty' to think about the ethical implications of one's activities.

Following this view, it could be argued that designers themselves are also responsible for the forms of practice that arise around the use of their technologies. On this reading, two types of designer responsibility are distinguished. First, designers consider the potential consequences of their technologies as a part of their design process. Second, designers actively build in particular kinds of persuasive effects in the design stage. It has been seen in the discussion of technologies *qua* scriptural forces that designers do in fact think about both the potential consequences of the deployment of their technologies when they are designed for specific purposes (i.e. this just 'is' the design process); also, that designers at the same time could be said to 'build in' scripts to the technologies, although these might change in practice. Further, this could be understood as a general process of making the particular design features of particular technologies more *explicit*, so that people have the opportunity to consider their engagement with them in a more thoughtful manner.

Further, this process would imply the designers are aware of the way in which technologies also *mediate* human behaviour and subjectivity. Persuasive technologies not only fulfill their explicit design function (e.g. the Persuasive Mirror aims to persuade people to lead more healthy lives), but this in turn rests on a mostly implicit framework of meaning and values. This means the technology organizes its environment in a specific way. It could be argued that designers should be more conscious of this *mediating* aspect of technologies. At the same time, it should be noted that technologies can take on different mediating roles in practice. In this sense, it would be unwise to attribute the strong form of responsibility (the second form above) to designers in isolation from broader social practices. Again, this points to the importance of having more discussion, more widely, about the role of various technologies in the wider society.

So, for example, the low-energy light bulb has been shown to actually encourage people to consume more energy, as it is so cheap to leave it on. Hence, people are more likely to leave a low-energy bulb switched on, whereas they would tend to turn a high-energy bulb off. This is an example of the technology taking on a different function from its design function in practice. There is no reason why this could not also be the case with intelligent and persuasive technologies. Here, however, it is important to be aware of the nuanced debate concerning control, as was articulated in some detail about regarding Foucault's notions of biopower and biopolitics. Whilst technologies do have specific desired functions, and hence aim to influence people's behaviour in different types of ways, it would seem that this comes close to the ideas that technologies are designed explicitly to 'control' people and their behaviour in particular ways.

The issue here, as suggested above, is that technologies often work in ways that are *implicit*. Hence, whilst their might be consternation when the Government would ban all forms of alcohol by legislation, as this would be seen as an infringement on individual liberty, technologies that aim to 'persuade' people to drink less might seem more innocuous, and not an explicit form of interference in the sovereignty of the individual. Here, it would seem not so much individual designers that should be held to account, but in fact, the democratic state. Is there a role for Government funding of such smart

technologies to help 'encourage' people to live in particular kinds of ways? This would seem to be a *political question*, depending on how far it is considered the right role for Government to encourage certain types of behaviour over others. This also points to the need for more discussion on a social level about the development and deployment of technologies.

6.3.1 Responsibility for a Value-Sensitive Design

One of the promising approaches for evaluating ethical values in technology design is the theory of *Value Sensitive Design* (cf. Friedman 1997; Friedman et al. 2002; Friedman and Kahn 2003; Friedman 2004). A characteristic of the theory of Value Sensitive Design (VSD) is to take into account human values:

> ''Value Sensitive Design is a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process.'' (Friedman, Kahn and Borning 2002: 1)

As explained by Van den Hoven (2005), "Value-Sensitive Design provides us with the opportunity to deal with […] ethical issues in a new and fresh way: by 'frontloading ethics' and by all means the proactive integration of ethical reflection in the stage of design."

Thus, as Albrechtslund (2008) reports, for Friedman et al. (2002) VSD has a number of advantages compared to other approaches that try to connect design and ethics and combines ''a unique constellation of features'' summed up in seven points (cf. Friedman et al. 2002: 2):

(1) VSD is proactive, as it influences the design process from beginning to end;
(2) VSD deals with a broad variety of contexts, including the workplace, education, the home, commerce, online communities and public life;

(3) VSD deals with a broad variety of human values, including cooperation, democracy and especially values with moral import;
(4) VSD combines conceptual, empirical and technical aspects into an integrated methodology;
(5) VSD is interactional, because it combines the views that social systems affect technological develop- ment, and new technologies contribute to the shaping of individual behavior and social systems;
(6) VSD draws on ethical theory in order to attain a principled approach of abstract ethical values to the design process that maintains certain universal values regardless of casual opinions;
(7) Ethical theory aside, VSD takes into consideration concrete values that are universally held through different ages and cultures.

Friedman et al (2003), posit that this movement towards human values and ethical considerations reflects "the increasing impact and visibility that computer technologies have had on human lives." (Friedman and Kahn, 2003: 1178) VSD is summarized by Friedman et al. as an approach that:

> [b]rings forward a unique constellation of features. First, Value-Sensitive Design seeks to be proactive: to influence the design of information technology early in and throughout the design phase. Second, Value-Sensitive Design enlarges the arena where values arise to include not only the work place […] but also education, the home, commerce, online communities, and public life. Third, Value-Sensitive Design enlarges the scope of human values beyond those of cooperation […] and participation and democracy […] to include all values, especially those with moral import. Fourth, Value-Sensitive Design contributes a unique integrative methodology that involves conceptual, empirical, and technical investigations. […] (Friedman et al. 2002: 2)

Thus, the challenge to explore ethics and values in relation to technology design, poses a number of questions. As Friedman and Kahn ask:

> [I]f human values, especially those with ethical import […] are important, they are no less controversial. What values count? Who decides? Are values relative? Or are some values universal, but expressed differently across culture and context? Does technology even have values? […] [O]n what basis do some values override others in the design of, say, hardware, algorithms, databases, and interfaces? (Friedman and Kahn: 2003: 1178)

Huits (2010) describes, that VSD particularly focuses on "values with moral import that are often implicated in technological developments, such as the values of human dignity, justice, welfare, human rights, privacy, trust, informed consent, respect for intellectual property rights, universal usability, environmental sustainability, moral responsibility, accountability, honesty, and democracy" (Huits 2010: 88).

Also Mary Cummings (2006) points out that VSD focuses on a broad spectrum of values, "values referring to what persons, either singularly or collectively, consider as important to their lives". Friedman argues in a similar way and underscores that values depend substantively on the interests and desires of human beings within a cultural milieu. (Friedman et al., 2006)

This has the consequence, that VSD has to take a 'middle position' between moral universality and moral variability, which "needs to be robust enough to substantiate the value under consideration and yet adaptable enough so that different cultures (or subcultures) can use the design in their own way." (Friedman and Kahn: 2003: 1183) In agreeance, Flanagan et al. (2008) argue that:

> [t]he study of values in technologies pushes us to ask questions about origins and sources that are far from settled in the general study of moral and political values. In the absence of clear answers to these questions, recourse to a pragmatic middle-ground seems reasonable. This means going along with the idea of a hierarchy of values in which a 'thin' set are taken as common to all humanity and thicker sets associated with groups and subgroups of varying sizes and compositions […] On the issue whether values can be derived, analytically, or must be discovered, empirically, a middle-ground sees virtue in both, drawing conceptual clarity and normative justification from theoretical works in moral and political philosophy, while supplementing these with knowledge about actual interpretations and value commitments of populations relevant to technologies under study. (Flanagan et al. 2008: 326)

Furthermore, VSD involves a technical investigation to identify the particular values that a particular technology support and/or diminish, and therefore "adopts the position that technologies in general, and information and computer technologies in particular, provide value suitabilities that follow from properties of the technology. For example, a screwdriver is well suited for tightening screws but functions poorly as a ladle, pillow, or wheel.'' (Friedman, Kahn and Borning 2002: 3)

Thus, as I described in Chapter 2, it is important to understand that this instrumental view does not go firm with the concept of the multistability of technologies. (Ihde, 1990) The fact, "that design and use do not simply correspond can be substantiated historically and phenomenologically" (Albrechtslund, 2008: 68). This is described by Anders Albrechtslund as the "positivist problem" (Albrechtslund, 2008: 68).

Technologies are always part of a shared *human* world, or lifeworld as Don Ihde states: "Just as there is no such thing as 'an' equipment, neither is there an equipment without its belonging to some set of culturally constituted values and processes". (Ihde, 1990:126) In Chapter 3 I mentioned the example of the telephone. The telephone was first designed with the aim of helping them who hardly are able to hear. This is the role it initially played in society, relative to the hearing-impaired, and hence was the identity it took on

within society. However, the telephone then began to be used relative to a much broader group of people, rather than being in a relation to the hearing-impaired, the telephone entered into a relation to people more generally in society. This is to say that the technology is *multistable*: it is fundamentally dependent on the concrete context in which it enters into a mediating relationship with some person or other. This captures a distinctively social, and ultimately changeable process: "the social dynamics that transform the stabilized meaning of a technology into another, stabilized, form" (Kiran, 2009:159).

According to Albrechtslund (2008), the challenge to designers of 'ethically sound technology' is thus to imagine potential use contexts and the ethical scenarios they create and VSD does not take into account such dynamics. In other words, "designers should imagine as many multistabilities as possible while designing technology in order to anticipate future ethical problems and dilemmas" (Albrechtlund, 2008: 71).

Another, potentially useful, framework for making good practical sense of the developing and mutually-reinforcing relationship between the use and design of technologies is the general method of Constructive Technology Assessment (CTA)[47] (Schot, 1992; Rip, Misa and Schot, 1995). CTA understands the development of technology as an 'evolution' where different 'variations' are considered relative to particular 'selection environments', such as for example market laws. Hence, only the 'fittest' variations are taken forward and developed. However, unlike natural selection, the development of technologies is a conscious process of design; designers can thus anticipate particular selection environments – in fact, as Verbeek (2006) states, this could be seen as part of the process of design. Hence, CTA aims to organize this process more systematically, and to ensure that all relevant groups are considered as selection environments. In one way, this can be understood as 'democratizing' design; further, all groups have an opportunity to reflect quite consciously on the technology and its potential implications or consequences when in use in particular social contexts. (Verbeek, 2006)

However, similar to VSD, CTA focuses on *human* actors (Verbeek, 2006), yet does not consider the role of technologies as *active mediators* in human-world or human-human relationships, or as active mediators in human subjectivity and identity itself. In this sense, it does not systematically appraise the types of mediation that might arise in use, or other types of mediation that might be more or less desirable. Hence, it can be argued that CTA should also integrate a systematic appraisal of *technological mediation* (Verbeek 2005, Ihde 2001).

The appraisal of mediation by different groups described above should ensure that a number of possible mediations are considered, yet does not necessitate that all such possible mediations will be considered. It hence offers a way to consider the process of 'inscribing' technologies with scripts, and the function of those scripts in sites of social process. Further, it ensures that the responsibility for developing technologies does not reside solely with the designers, as this thesis has argued should not be the case.

However, it does provide some method of shaping the important *moral discourse* concerning technologies, their design and deployment, by understanding this in the specific context of technological mediation (Verbeek 2005, 2006).

Following the above discussion and acknowledging the importance of Verbeek's concept of technological mediation for an understanding of the implicit effects of technologies, it is possible to make a brief sketch of design guidelines that could be usefully utilized by designers in the process of designing AmI. These guidelines reflect a number of key contentions of this thesis: that responsibility for AmI is distributed between users, designers and other stakeholders; that design is a moral activity and should be a morally responsible one; that as much knowledge and understanding as possible should be held on the part of both designer and user about the possible mediations and their moral effects of various AmI in their specific contexts of use.

The impact of technological mediations results from both the roles human beings allow technologies to play in their lives, but also from the characteristics of technologies that

help to shape those mediating roles. Moral responsibility thus has a distributed character, being shared between users and those involve in the process of design in various ways.

Following Verbeek's outline of an *ethical framework for persuasive technologies* (2006)[48], a number of basic guidelines can be articulated concerning the morally responsible design of new technologies:

1. The in-built standards that govern the particular persuasive technology should be made explicit; this can take the explicit form of incorporating this explicitness into the design itself, or a weaker implicit form would be to include a set of written guidelines with the technology to explain these standards.

2. If and where the technology entails values and norms, a *conceptual analysis* (Verbeek, 2006: 5) should be completed to ascertain how and to what extent the technology expresses these values and norms.

3. On the basis of this conceptual analysis, the design process can focus more clearly on how to materialize these norms and values to develop particular prototypes. This should be encouraged as follows:

a) The deliberate explication of a shared ethical framework for designing the technology to materialize these specific and agreed norms and values.

b) The ability to translate this framework into technical requirements and tools.

c) Fostering an open-minded attitude towards the implementation of various ethical values.

d) Fostering a flexible attitude surrounding design, and an understanding that the design may be changed in line with changes in ethical values.

e) Conducting an ongoing assessment of the values and norms materialized in the technology, and referencing this against the shared ethical framework.

[48] Vebeek, P. (2006). 'Persuasive Technology and Moral Responsibility. Towards and Ethical Framework for persuasive Technology'. [Online}. Available: http://www.utwente.nl/gw/wijsb/organization/verbeek/verbeek_persuasive06.pdf. Accessed March 21, 2010

4. Based on post-phenomenological concept of technological mediation (Verbeek 2005, Ihde 2001), a *mediation analysis* (Verbeek, 2006: 6) should be conducted, to anticipate the possible future mediating roles of the technology in its specific context of use – both intended and unintended mediations should be assessed. Here, what is important is both the moral imagination of the designer, and the utilization of a systematic method for delineating future mediations, involving both users and other stakeholders. (Verbeek 2006, Albrechtslund 2008)

5. A *moral assessment* (Verbeek, 2006: 7) should be conducted of the various mediations diagnosed. First, it should be ascertained whether these mediations are morally desirable in lines with the ethical framework articulated in (1). Second, the list of mediations should be incorporated into the design of the technology.

6. An *identity related mediation analysis* should be conducted; broadly, this means thinking systematically about the ways in which the technology is able to mediate personal identity in use. This analysis should mainly focus on intended mediations and pay attention to the possibilities that exist for individuals to get actively involved in the mediation processes of their identities. When conducted this analysis, a number of points should be kept in mind:

a) A restraint in generating, storing and collecting data without clear aims.
b) Enabling subjects to endorse or reject their acquired or imposed identities.
c) The possibility for users to actively (co-) shape available identities and profiles.

On the basis of the points (1)-(6) above, a suitable design can be chosen. Though far from complete, this sketch provides a start for addressing the implicit moral concerns arising from the ubiquitous technological mediation processes of individuals on the basis of Ambient Intelligence and persuasive technologies.

http://playstudies.wordpress.com/?s=evidencelocker

6.3.2 Media Art

Contrary to the view on technology in the example of the PlaceLab, one insightful perspective into issues of more complex and immersive human-technology relations often neglected in the literature on AmI concerns the work and reflections of 'media art'. Media Art offers a unique approach compound to research into HCI. Those working within this field, as artists, tend to be concerned with the way in which people experience their relationships with technologies, and the particular potential that such technologies open up for new types of experiences and expressions of agency. In this sense, media artists do not only conceive AmI-like technologies in relation to traditional sense of tools to complete a specific task or set of tasks, but rather more broadly as interesting and potentially useful technologies to be engaged with in their own right from a more open-minded and experimental perspective. In this sense, media art can be useful in suggesting alternate ways to think about AmI technologies, and to offer a counterweight to some of the more negative reflections or conclusions concerning human agency often found in literature. Contrary to the view of technology as disciplinary apparatus as understood by developers of the PlaceLab-project, "it seems that for media artists, technology is not about task completion, and interaction does not limit itself to information processing. And contrary to the concept of a 'user', a person engaging in a work of art is understood as a participant" (Boehlen, 2007: 3).

Evidence Locker[49] is a 2004 work of Jill Magid. In 2004, Jill spent 31 days in Liverpool, during which time she developed a close relationship with Citywatch (Merseyside Police and Liverpool City Council), whose function was citywide video surveillance - the largest system of its kind in England. On her project-webpage she writes,

[49] http://www.evidencelocker.net/story.php

> that the videos in her Evidence Locker were staged and edited by the artist and that she used films by the police from their public surveillance cameras in the city center. Wearing a bright red trench coat she would call the police on duty with details of where she was and ask them to film her in particular poses, places or even guide her through the city with her eyes closed, as seen in the video *Trust*.

Unless it is requested as evidence, CCTV footage obtained from the system is normally stored for 31 days before being erased, so for access to this footage, Magid had to submit 31 Subject Access Request Forms - the legal document necessary to outline to the police details of how and when an 'incident' occurred. Magid chose to complete these forms as though they were letters to a lover, expressing how she was feeling and what she was thinking. These letters form a diary called *One Cycle of Memory in the City of L*- an intimate portrait of the relationship between herself, the police and the city.

Artistic explorations of technology comprise an important domain in which training practices for hybridization can be studied, as Petran Kockelkoren (2003) shows. For example, he has explored the different ways artists deal with the confusion caused by new technologies. Following Helmuth Plessner (1975), Kockelkoren analyses the user**'**s confused experiences as a **'**decentering**'** of the subject. As artists explore the challenges of new technologies, they contribute to a cultural learning process that, again after Plessner, can result in a **'**re-centering**'** of the subject. (Dorrestijn, 2011 referring to Kockelkoren, 2003)

In AmI technologies, programmers are interested to find specific ends or to provide solutions to such particular or perceived issues; however designers are often not able to fully explore the capabilities and range of different uses of the technology. AmI-like technologies can offer new opportunities for Media Art interaction, as they try to consider irrational, non-utilitarian or otherwise not suitable for the completion of desirable roles. However, media artists do not often have access to robust design methodologies and engineering strategies needed to develop AmI to play very different kinds of roles in

society. This has led Boehlen (2009) to call for AmI researchers and designers to expand upon their narrow concept of *interactivity* when designing AmI technologies and to incorporate their users.

The broader consequences of this kind of approach could be very interesting as well as open up discussion within society about the design and deployment of AmI technologies in the future. Rather, than think about particular AmI technologies that might fulfill particular functions for isolated individuals, often in an isolated-seeming domestic sphere, Boehlen (2009) urges us to think more widely about the possibility of building 'Ambient Cities', which could be new and very different places for large populations to live in. This would require serious discussions between a range of designers, engineers, politicians and the broader public about the building of such places.

This utopian orientation concerning AmI is in many ways a useful counter to the dystopianism often seen in the literature. For example, Heidegger understands the *res* of the *res publica* – the thing of the public thing – as that thing that can bring together what it separates. This highlights the particularly *social* element of AmI that is often missing from the contemporary literature, especially that concerning its design. It also draws out the way in which this technology can *mediate society* and can at the same time be *socially mediated.* Therefore there is a need to highlight public aspects of technology. Drawing on this insight, Latour [50] reflects that

> "We don't assemble because we agree, look alike, feel good, are socially compatible or wish to fuse together but because we are brought by divisive matters of concern into some neutral, isolated place in order to come to some sort of provisional makeshift (dis)agreement" (Latour, 1993).

This view highlights the way that people tend to 'come together' in order to discuss and engage, agree and disagree on matters of common concern.

[50] Latour B. (1993) *We Have Never Been Modern*. Harvard University Press.

Latour (1993) suggests that society develops a 'parliament of things', which is open to everybody and everything, including animals, plants and inanimate objects, even including AmI technologies. What is needed is a particularly *humanist* discussion about the role of technology in our everyday lives, what this means for us and how it can be developed to best serve the needs of *humanity* in the future. Media artists have qualitative expertise in this regard and might be very helpful for these discussions, particularly about AmI's ethical and social affects.

6.4 Materializing morality

For many writers, however, the primary *moral* question concerning AmI and Persuasive Technology is how this affects the moral status and actions of their users. As Verbeek (2009) notes: "when technology begins to influence our moral choices, the moral character of our actions seems to disappear" (Verbeek, 2009:237). The idea here is that once technologies are presented in moral contexts with the *specific aim* of influencing those moral contexts, then the extent to which a subject can exercise *agency* is diminished. For Verbeek (2005), this leads to two types of argument against introducing these technologies into society. First, opponents argue that doing so would create a technocracy, where technology increasingly controls us and makes decisions on our behalf. Second, is the idea that introducing such technologies robs human actions of the moral aspect, since human behaviour is being controlled in significant ways. This is further complicated when it is considered that such technologies, as raised by Fogg (1999), seem to hurry on a general process of commodification. This has profound effects on the *moral life* of the human being in general:

> Here, the capacity for moral reflection, which is not the least of human capabilities, seems to be swapped for a voluntary exposure to influence from technology. In this case, if the mind is willing, but the flesh is weak, people choose not only to have their flesh influenced, but also their minds.

> A part of our conscience is deliberately placed in the material environment, and that environment forms not only the background of our existence, but educates us too. (Verbeek, 2005:137).

As was noted earlier in this chapter, dystopian scenarios are as unhelpful as utopian ones, but the above quotation does serve to illustrate a kind of 'outsourcing' of decision making that can happen with 'delegating' particular tasks to technologies, rather than the implied, 'doing it ourselves'.

However, for Verbeek (2005), and I follow him on this point, it can be understood that Ambient Technologies simply 'radicalize' the influence that technology has always had. What is specific to these technologies, however, is the way that they play the role of *mediators*. This is that they subtly try to control the way in which people conduct certain actions, and that is not always clear 'who' the user is in such situations. However, and importantly, once can choose to *resist* what the technology suggests in each instance, which entails that the technology is not fully determining one's behaviour. Indeed, this is a normal phenomena regarding technology, as Latour (1992; 1994) argues, technological artifacts mediate *action* and can thus be said to 'co-shape' the sorts of things that people do. For Verbeek (2005; 2007; 2008), this has the further implication that, since ethics concerns the question of how to act, and technologies shape how people act, that therefore technologies have an inherently ethical dimension.

One particular example Verbeek (2007) uses to illustrate this proposition I presented already in Chapter 3 and is worth working through in detail. It concerns the use of ultrasound in creating a picture of a child whilst still in the mother's womb. Following Ihde, Verbeek (2007) notes that ultrasound co-constitutes how the unborn is perceptually present, and establishes a hermeneutic relation between the parents and the unborn. It could be said that the ultrasound embodies one particular material interpretation of reality. It actively mediates the way in which the unborn is given in the experience of the people who 'see' it on the screen. Importantly, it is noted that the ultrasound screen magnifies the size of the fetus, so that it appears the size of a newborn baby, and also disconnected from its mother, which it in fact is not. In turn, this creates what has been called a 'fetal personhood', as adult observers are encouraged to see the fetus as a person

(Mitchell 2001; Boucher 2004). The most important consequence of the way ultrasound allows this 'fetal personhood' to be perceptually present to the parents is that this also constitutes the parents as decision-makers about their unborn child. Hence:

> To be sure, the role of ultrasound is ambivalent here: on the one hand it may encourage abortion, making it possible to prevent suffering; on the other hand it may discourage abortion, enhancing emotional bonds between parents and the unborn by visualizing "fetal personhood". But nevertheless, ultrasound places expecting parents in the position to make a decision about the lives of their unborn children. By constituting both the unborn, the father and the mother in very specific ways, it helps to organize a new relation between the three. What appears to be an innocent look into the womb, can end up being a first step in a decision–making process for which many expecting couples did not explicitly choose. (Verbeek, 2007:4)

Here, the further the idea that the ultrasound *organizes a relationship* between the two people and their unborn child is introduced, which is in some sense the 'first step' of a decision-making process. This is because, as Verbeek (2007) notes, the ultrasound is a usual procedure to help determine the time of birth after 11 weeks; however, it is also a time when it is possible to spot the first signs of Down's Syndrome and some other illness. Hence, parents cannot be expecting or intending to have to make a decision; they then are presented with one. In short, I can imagine, then, that if the fetus is found to have a terrible illness because of the ultrasound, the parents can make the decision to have an abortion. In such a situation, for Verbeek (2007), there are ethical implications, which mean that it makes good sense to ask if some form of moral agency should be ascribed to ultrasound scanners.

For Verbeek (2007), the answer to this question is 'yes'. It has been seen already that for Verbeek (2007), it makes sense to say that technological artifacts not just shape human behaviour, but that they are *active* in this process, in significant ways. For example, they shape how the world appears to us, or is perceptually given, in experience. It then makes sense to say that people can make decisions because of our technologically mediated experience that we

would not have been able to make without it. As stated before, for Verbeek artifacts 'have intentionality' in the general sense that they have a kind of *directedness*, that they *point towards* the world in particular ways. This means that: "technological mediation…can be seen as a specific, material form of intentionality" (Verbeek, 2007:6). Then, since artifacts are not *conscious* and so cannot form intentions of their own, they need to 'get' their intentions from somewhere. For Verbeek (2007), artifacts get their intentions from their designers. This means that, following Searle (1983), the intentions of artifacts are always completely reducible to the intentions of people. Hence, the *material intentionality* that can be seen in artifacts is both different and similar to the form of intentionality that is standardly attributed to human beings. These wider relationships between people and technologies must be 'in place' for these intentions to 'come into play' in specific circumstances. As stated in Chapter 2, for Verbeek (2007), this creates a 'hybrid intentionality', between human beings and artifacts.

However, in the above example, it is possible to accept the mediating role of the ultrasound, and even to go along with Ihde on the way that the ultrasound forms a hermeneutic relationship between all concerned, shaping how the fetus is present in experience, and hence, raising possibilities for action that weren't previously raised. However, this does not entail or imply that it must be accepted the idea that this means the ultrasound is morally evaluable *qua* technology in any specific way. Neither does it mean that the designers *qua* people from whose intentions the world-directedness off the ultrasound can ultimately be reduced, are implicated in any particular or obvious moral way, either. Rather, if all human experience in contemporary society is mediated by technology in various ways, it seems consistent here to argue that people just *are* who they are when co-constituted by technology, and that it is that person, who they *are* who makes any decisions, shaped or otherwise in particular ways, by the technology. There is an obvious ambiguity on these and related questions in the relevant literature, and in the example of ultrasound offered by Verbeek (2007). In order to offer a slightly different perspective of the moral dimension of our technologically mediated relationships with technology, I now return to Foucault and to the issues of trust and self-practice, in an attempt to resolve the ongoing ambivalence about the role of technology in our daily lives.

6.5 Trust and self-practice

The second approach to the question of morality and technology that I now present towards the close of this chapter is that of Foucault, and his idea of *care of the self* through *self-practice*. This thesis has already met Foucault and sketched his general view on the role of technology in our everyday life in the previous chapter. As I have not the space to embark on any more thorough statement of his thinking and its development more generally, and it would further fall outside of the scope of this thesis, I direct the reader to Bevir (1999), Gordon (1999), and Kiran and Verbeek (2010) whose readings have formed the background for the below. I argue that, however, it is not necessary to worry that AmI and Persuasive Technologies are going to rob people of agency and autonomy – at least not particularly any more or less than any other technology might – and I reject the view, offered above, that for instance ultrasounds play any particular or distinct *moral* role if the parents of an unborn child choose to have an abortion as the result of a scan. Rather, I defend the coherence of the free and the moral subject, despite the lack of ideal conditions for such a being.

6.5.1 Trust and technology

A central component to the relationship between one person and another is that of *trust*, which was further examined in earlier discussions of friendship with regards to the possibility of the development of technological subjects with whom people can forge relationships *as if they were* human beings. It is significant, however, that *trust* is not usually considered in the context of both the mediating role of technologies, and in connection to any moral discourse concerning them. Indeed, the commonsense view of 'trust' would understand it as a particular kind of external, dyadic relation that exists between two given, independent entities. This conceptualization of trust is a product of the 'extension thesis' rejected in Chapter 2 of this thesis, where technology is considered as existing in a relation of 'extension of' to human beings, augmenting what is already there. On this view, it would seem difficult to properly explicate an understanding of trust

that makes sense in the context of a *mediating* relationship (as opposed to an extending relationship) of co-constitution between people and technologies. In fact, understood as an external relation, it becomes prevalent to understand the relationship of trust between people and technologies as one of a matter of degree: we are either more suspicious, or less suspicious, of the technology. However, Kiran and Verbeek (2010)[51] suggest trust between human beings and technologies can be understood as an internal relationship. On this reading, the development of technology in general is a profoundly *moral* issue, that simultaneously affects in significant ways what it means to be a human being, and hence the meaning of humanity. This idea chimes with the framework developed throughout the development of this thesis, that technology has historically *mediated* both individual human beings and human society or humanity more generally, in different ways and at different times. Heidegger was one of the first to theorize that something *changes* in the way that technology mediates both individuals and humanity with the dawn of the modern period. However, the folly of trying to reject technology – if not the impossibility of doing so – has also been rejected. So, drawing on the way in which technology mediates human subjectivity, it is possible to draw a more useful picture of what it might mean to trust technology. As has been argued throughout this thesis, and drawn out from Heidegger through to Foucault, is the importance of *being aware of* the way in which technology mediates human subjectivity and identity. Whilst for Heidegger this takes the form of being aware of on a more social, or historical level, for Foucault it takes the form of being aware both of the context of biopolitics, but mostly at the level of one's individual relationship with technology. Hence, if one is *actively* involved in the mediation of oneself by technology, trust then takes on the character of confidence, it means to *deliberately trust oneself* to the technology (Kiran and Verbeek, 2010).

On this reading, the moral question concerning both the development and use of technologies is answered in a particularly straightforward way: technologies should enter human society in trusted situations, and be barred from entering human society in situations of distrust. This is to say that it is important to make a self-conscious or deliberate decision to engage with technologies in particular ways in particular sites of

[51] Kiran Asle H. and Verbeek P.P. (2010), 'Trusting Our Selves to Technology'. In: Knowledge, Technology, and Policy (Online First, Issue 23 - paper version will follow soon). ISSN 1874-6314.

social praxis. In this sense, it is possible to offer a way to transcend the ambivalence about technology that has run throughout this thesis. This ambivalence has been characterized by the idea that technology is either a domination of the human being, or it is a liberation of the human being. However, considering the way in which technology *mediates* the human being, it becomes more and more difficult to understand 'human being' and 'technology' as two unconnected – or rather simply externally connected - sides of the same coin; rather, the human being itself is a mediated being through and through. One way in which the human being is mediated is through technology, which is further a significant method of mediation, especially concerning the mediation of both subjectivity in general, and identity in particular. Hence, it is revealed that the ambivalence about technology – coercion or liberation – in the way it tends to be posed both in the literature and in the wider society, is a false dichotomy. Rather, *how far* technology is either coercion or a liberation is in turn dependent on how that technology mediates human beings, which is in turn dependent on how far we make a choice to trust that technology. It is possible thus to build a more accurate and useful understanding of trust from the failings of the account of trust as an *external* relation, that further rests on the extension thesis regarding the proper relationship between people and technologies. Kiran and Verbeek argue that the former account is flawed, because it gives us: (a) an incorrect notion of technology; (b) a flawed conception of the human–world relation; which implies (c) an inadequate conception of the constitution of the human self (Kiran and Verbeek, 2010).

6.5.3 Self-care

Building on the discussion above it is possible to develop a different account of *trust* to the dominant account of trust as an extension of risk (Kiran and Verbeek, 2010). It is possible to reinterpret a particular aspect of what has been previously articulated as Heidegger's views on technology, and redeploy certain ideas in a different way. First, it should be understood that for a tool to function *reliably* that this does not simply means that it functions without breaking, but also that it forms the basis of a new relationship

between its user and the world, which allows the user to experience or to be-in-the-world in specific ways. The tool thus 'reliably' constitutes both the world and the person with a particular kind of mediation. Second, according to Kiran and Verbeek (2010), it is important to place Heidegger's fears concerning technology in the context in which they arose, as fears about a developing industrial society after the destruction (using technology) of two World Wars, where technology was used in production processes where it either displaced workers or dominated their existence (for example in the factory), or where technology was developed that facilitated mass killing and genocide. These should not be understood as fears about technology *per se*, but rather fears about the forms its use can take in particular contexts. It is possible to understand human beings as constituting humanity (Stiegler, 1998). In an historical and anthropological sense, the use of tools allowed humanity to develop and evolve, and for human societies to develop, in the way that they have done. Hence, Heidegger's analysis that technology is a basic framework in which human beings find themselves should be understood not as a *threat* to humanity, but on the contrary, as a source of it. Hence, the condition of man within this framework *just is* 'the human condition'. For Heidegger, the human condition within modernity more generally is one of alienation; however, it can be argued that the use of technologies within the domestic sphere is not *ipso facto* a form of alienation in the same way. Further, it is possible to read the understanding of the human condition in modernity as one of alienation as not just a social or philosophical theory, but also a political viewpoint. Read in this way, it does not imply the rejection of technology; rather, it implies the embracing of technology in the service of human ends.

Hence, conceptualizing the relationship between human beings as 'internal' in the way articulated above does not then mean that human beings are 'helpless' in the face of technology, or completely dominated by technology in the sense that they can no longer exercise agency, free will or moral determination. Rather, the technological mediation of human beings is a task, which should be approached from the point of view of aiming to better shape human existence through technology, to give better shape to human technologically mediated existence. This brings out the underlying, although perhaps sometimes obscure or ambiguous, quite radical thrust of Heidegger's philosophy.

Following Dorrestijn's (2004)[52] reading of Foucault's notion of 'care of the self', it then becomes possible to understand the active shaping of one's technologically mediated existence as a form of 'care'. Further for Heidegger, self-care is a peculiar aspect of human beings. Hence, considering the technologically mediated character of human existence, makes it possible to add a reflexive, or second-order, dimension to this care-structure of human existence: "Human existence takes shape in 'careful' relations with other human beings and things; but human beings can also take care of the character of these relations themselves. Rather than merely being 'implied' in a technological system, they can be aware of the ways in which technologies help to give shape to their existence, and be actively involved in this constitution of the self" (Kiran and Verbeek, 2010: 15).

Further, this particular form of 'self-care', according to Kiran and Verbeek (2010), can be seen as an expression of Heidegger's (1977c) notion of *Gelassenheit*, or 'releasement', which is considered as the only escape or 'release' from the manipulative method of technological thinking. This attitude involves saying both 'yes' and 'no' to technology: accepting it is necessary, but not becoming too deeply involved with it. However, for Dorrestijn (2004), saying both 'yes' and 'no' to technology does not imply minimizing one's involvement with it. Rather, the form of self-care Dorrestijn (2004) advocates implies a more explicit engagement with technology, as a secondary form of distance. This means that 'releasement' involves a 'taking care of' one's technologically mediated existence, which leads to a developed account of 'trust' as a kind of confidence, where human beings actively and deliberately 'trust themselves' to technology. This implies that responsibility for one's engagements with technology needs to be taken.

This leads me direct to Foucault's concept of 'self-care'. For Gordon (1999), Foucault conceives the subject as a being-in-the-world, rather than an "autonomous rational being set against the world as Berlin would have us think" (1999: 5). However, this doesn't undermine the possibility of a *free* or an *ethical* subject. Rather, *pace* Heidegger, for Gordon (1999), freedom is understood

[52] Dorrestijn S. (2004) Bestaanskunst in de technologische cultuur: over de ethiek van door techniek beïnvloed gedrag. Master's thesis. University of Twente, Enschede

in a relational sense. For Foucault, freedom is a relation with power, such that there can be no exercise of power unless there is first a free subject over which power can be exercised. Further, for Bevir (1999), what is important is to understand the development of Foucault's positions on the subject over the course of his life. For Bevir (1999), the 'composed Foucault' discerned in his work defends *human agency* in some form, namely, to ask what a *suitable form of agency* might be, given the 'normalizing' effects of social power. For this 'composed Foucault', it tends to be the case in modern societies that when subjects do assert themselves, it is only to regulate themselves regarding social norms. Hence, the *ethic of care for the sense* becomes tied to the project of creating a kind of agency that can resist the coercive powers of modernity, and point towards something 'better', perhaps. Foucault thus opposes morality (imposes restrictions) with ethics (a practice through which to negotiate a relationship to such restrictions).

In more detail, Foucault's idea of *ethic* is taken from the pre-modern, and noticeably also pre-feudal, Ancient Greek culture, which he understands as premising a personal interpretation of loose social codes, or the exercise of certain kind of *aesthetic* in relation to those codes. The ancient model of the Greek culture helps Foucault to offer an alternative model of ethics that aims to face the challenges raised by today's changing ethical experience. (Fillion, 1998) He states that, "the idea of ethics as obeisance to a code of rules is in the course, at the moment, of disappearing, has already disappeared. And the answer to this absence of ethics is, must be, a research of the kind of an aesthetics of existence" (Foucault 2001:1551). Consequently, in *The Use of Pleasure* (1985) Foucault writes:

> [...] I am referring to what can be called the "arts of existence." What I mean by the phrase are those intentional and voluntary actions by which men not only set themselves rules of conduct, but also seek to transform themselves in their singular being, and to make their life into an oeuvre that carries certain aesthetic values and meets certain stylistic criteria. These "arts of existence," these "techniques of the self," no doubt lost some of their importance and autonomy when they were assimilated into the exercise of priestly power in early Christianity, and later, into educative, medical, and psychological types of practices. Still, I thought that the long history of these aesthetics of existence and these technologies of the self remained to be done, or resumed. (Foucault, 1985: 10-11).

This type of historical analysis can be seen as “providing a critical self-knowledge, a knowledge that can show the different ways our ‘selves’ may be constituted and constructed” (Fillion, 1998: 145). Foucault argues that: "among the cultural inventions of mankind there is a treasury of devices, techniques, ideas, procedures, and so on, that cannot exactly be reactivated, but at least constitute, or help to constitute, a certain point of view which can be very useful as a tool for analyzing what's going on now — and to change it." As stated in Chapter 5, such ‘technologies’ “permit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection or immortality” (Foucault 1988: 18). For Foucault this means to envision a transformatory pragmatics of life: “The art of living is the art of killing psychology, of creating with oneself and with others unnamed individualities, beings, relations, qualities” (Foucault 2001: 1075; transl. by Paras, 2006: 129). He understands this approach as a philosophical exercise whose "object was to learn to what extent the effort to think one's own history can free thought from what it silently thinks, and so enable it to think differently" (Foucault, 1985: 9).

Thus, the general laws of nature, the city and of religion still have to be taken into account and “should serve as the context, or background, of the actions of a particular individual, and not as a code or a model to be adopted” (Fillion, 1998: 151).

> The few great common laws — of the city, religion, nature — remained present, but it was as if they traced a very wide circle in the distance, inside of which practical thought had to define what could rightfully be done. And for this there was no need of anything resembling a text that would have the force of law, but rather, of a technë or "practice," a savoir-faire that by taking general principles into account would guide action in its time, according to its context, and in view of its ends. Therefore, in this form of morality, the individual did not make himself into an ethical subject by universalizing the principles that informed his action ; on the contrary, he did so by means of an attitude and a quest that individualized his action, modulated it, and perhaps even gave him a special brilliance by virtue of the rational and deliberate structure his action manifested (Foucault, 1985: 62).

For Foucault, this means that the Ancient Greeks had a large degree of *freedom* in how they interpreted – and how far they kept – social norms. For Bevir (1999), this underlying idea of freedom of interpretation is linked to the project of creating a kind of 'space' for the emergence of such an ethic in contemporary society. This 'space' is not limited to the private sphere, but rather, is necessarily orientated to both the private and significantly *public* spheres. The rejection of the normalizing effects of contemporary technology hence becomes a precondition for an *aesthetic relation* to the self. That self is constituted actively through a process of taking *care of the self*. This means being able and willing to use social resources, and exploring the 'authorised limits' of subjectivity. Hence, people are free insofar as human beings in their everyday social praxes can be in a state of 'permanent critique'. For Dorrestijn this leads to the conclusion that "behavioral constraints by technologies should not be seen as replacing moral law, but as part of the hybrid character of the self that one can problematize and actively shape. Ethics is then not about obeying, subjecting to technology, but about concern for the influences of technology and the wish to give style to our hybrid form of existence" (Dorrestijn, 2011: 236).

Verbeek (2005) further draws out the way in which *the care of the self* has particular significance for the philosophy of technology:

> Foucault's ethical perspective unites two aspects that usually remain opposites in ethics: the radically mediated character of the subject on the one hand, which causes the subject to lose the autonomy it used to have ever since the Enlightenment; and the ability of the subject to relate itself to what mediates the subject on the other hand, which enables the subject to actively help to shape these mediations. (Verbeek, 2007:10)

From a Foucauldian perspective, the technologically mediated character of life in a technological culture does not need to be seen as a *threat* to the subject but rather forms a specific way in which the subject is *constituted*. However, it is not immediately apparent that Verbeek (2007) is right to suggest that the radically mediated character of the subject on the one hand and the ability of the subject to help shape those mediations on the other

are usually ‘opposites’ in ethics. Rather, the two mutually reinforce one another. The problem with Verbeek’s (2007) formulation is that it suggests that the ‘death’ of the autonomous subject is the natural consequence of the discovery of the mediated subject. However, this is not the case. If it as accepted, as this thesis has argued, that the subject *is always mediated*, and specifically so by technology, then this does not mean that the subject is not, or cannot also be, autonomous. It may mean that the subject can always be more autonomous, but historically, one could further argue this has been achieved through the use of technology on an ever larger and expanding scale.

Hence, freedom is not the *absence* of factors that steer and shape the subject, but rather the subject’s very *relation* to these factors. Freedom is a *practice* that is co–organized by the technological infrastructure of our existence, and which forms one turning point for the shape that our subjectivity takes. The subject, in Foucault’s words, is a *form* that always needs to get shape in concrete “self practices” (O’Leary, 2002: 2–3). However, it is not necessary to understand this ‘shaped’ subject as a counter-position to the autonomous subject.

The general implication of this view is then that it is both possible and ethically desirable for the subject to engage in a *care of the self* through the engagement with various kinds of technology in the contemporary world. This means that the mediated nature of the subject is a natural starting point for such an ethical self-practice. In contemporary society, technology both permeates our everyday lives and is a key factor in shaping our subjectivity. Embracing an ethic of care of the self would therefore imply not resisting the role or presence of technology, but rather, engaging with it in an open-ended way, with an emphasis on developing a kind of personal aesthetic (Verbeek, 2007). This then connects us to one of the central questions for Foucault, of what *sort* of subjects people *aspire* to be: “Do we want to become pure, or immortal, of free, or masters over ourselves?” (Foucault, 1997:265). It is thus possible to appreciate how humanity is reconnected with the ultimately liberating potential of technologies, and the opportunities they offer for the pursuit of self-transformation.

6.6 Conclusion

This chapter has presented a number of issues concerning the moral dimension of AmI, and persuasive technologies in particular. It has also presented several important discussions as they appear in the relevant literature concerning design. The chapter began with a discussion of the literature on the way in which AmI technologies seem to 'blur' the boundary between people and machines. The more developed theories of Verbeek were critically presented on this issue. There, I argued that human societies throughout history, and more so in a peculiar way in the modern age, have been permeated by the use of technology. In this sense, it can be meaningfully held that human beings have for centuries been mediated by technologies, and in particular, that the way in which we understand *humanity*, our potential and ways of being in the world, is linked in a number of important ways to the sorts of technologies that we use and what we can achieve with them.

However, the next section considered in more detail the way in which AmI *does* constitute something of a different type in a discussion of the 'smart house'. This and the following sections hopefully served to outline an historical perspective on the rise of AmI technologies, and in particular, their early link to modernist visions about the future. I argued that there is a particular narrowness in the way in which persuasive technologies tend to be understood and related to in the contemporary climate, which is in turn related to the way in which the underlying relationship between individual and society is inadequately theorized by much of the literature, leading to overly 'atomized' conceptions of how individuals might in principle use particular technologies, and, moreover, the role that they could play in transforming society. I suggested that a return to the Modernist impulse might be no bad thing.

In this chapter, which has also has presented a view on ambient persuasion and its various effects on behaviour, I also argued that *the roles of* media artists and designers may help to bring into sharper focus the blurring of the boundaries that have an impact on the way in which we interact intimately with smart objects. Using the example of the Place Lab

(MIT), I questioned if the outsourcing of the human decision-making process that this implies makes a significant impact on our identity. A further topic of importance to this chapter is the potential of personalization: what kind of underlying orientation towards the development of AmI in society are researchers aiming for, and is it shared globally? As suggested in this chapter, if agents who work together as a disciplinary apparatus have the potential to shape everyone's identity, then personalization may be heavily disguised. As this technology is designed to also work in a visceral and unconscious way, it may be difficult to resist categorization.

Finally, the chapter turned to a discussion in more depth the issue of control, identity construction and managing behaviour, drawing on the work of Foucault regarding 'self practice.' I argued that there are some positive aspects to the idea that one can relate to technology in a careful way, and in so doing, use that technology to develop the self. However, I suggested that this is a particularly individualized way of doing things.
I therefore emphasized the *social* dimension of the technology and of people as socialized beings, and argued that a more public discussion concerning AmI is necessary.
In this sense, a better developed framework for discussing the design and deployment of AmI in the wider society is of key importance.

Conclusion

This thesis has critically examined a selective presentation about the understanding of the *mediating* role of technologies in everyday life as it has developed over more or less the last century in Europe and America. It has examined the role of modern technology in developed societies in particular with the aim to offer how historical development of ideas is needed to assetour the mediating role of technology. Through tracing the development of these new technologies in the world, and effects that these technologies have on a social practice, human experience and cultural and political norms, values and principles can be assessed. In order to situate the discussion about how technologies can *mediate identity* in a suitable historical and social context, a range of profound thinkers on these topics were componed. Our understanding of *intimacy* has been radically challenged by the introduction of new technologies.

In Chapter 1, I argued that new technologies represent a significant turning point for society, technologists and philosophers of technology alike. Here, the context for the study of technological mediating by briefly sketching recent developments in the field of Ambient Technology (AmI) in general and Persuasive Technologies in particular. Since the dawn of the modern age, the philosophy of technology has traced the design, development, deployment and use of technology in the shared social world. New types of technology lead to new types of theoretical reflection, and create a need for new analyses of the role of the technology in everyday life. Often this is related to a very practical project of developing social, cultural, legal and theoretical strictures and frameworks in the world, and exploring how technologies impact on social norms, practices and values. Ambient Intelligence Technology (AmI) represents a *significantly new* area of this technological development, and is fast becoming the quintessential example, used in the academic literature and in everyday discourse. Philip's "smart house", that was designed and displayed in the 1990s consolidated the need to examine and explore more thoroughly the role of smart technologies in people's lives, specifically regarding questions of identity, morality, intimacy and technological mediation in general.

In relation to the historical and conceptual groundwork for *technological mediation,* it was shown in Chapter 2 that Heidegger as "father" of the philosophy of technology, advocated a phenomenological perspective based on the assumption that human beings are immanent in a shared social world or *lifeworld*. Heidegger's concern with people's experiences of technology provided the groundwork for the subsequent exploration of AmI because he made a distinction between tools being used as *present at hand* and as *ready to hand*, and that this implied that objects *qua* tools must be understood as being bound up with particular contexts of social practice. He considered that their *use* should be by human beings and for human beings. Heidegger also explored that objects *qua* tools are an *extension* of the human body. However, it was found that whilst this thesis has an intuitive draw and is good at exploring experiences of pre-modern tool-use, that it fails to capture the more complex and contemporary experiences that people have of technology in the contemporary world, for example, in terms of things like autonomous or pro-active technologies. It was suggested that it is possible to understand new technologies, and older technologies, as *upgrades of practical space*, in the sense that they offer new possibilites for actions that people can have.

I also explored the "postphenomenological" departure from Heidegger through a presentation of the work of Ihde and Verbeek. In Ihde's typography of human-technology there were are a range of different *mediating relations of type* that contemporary technology may have with people in contemporary societies. In turn, this could lead to more complex and different forms of *mediation of subjectivity* or *mediation of identity*.

Therefore, more complex forms of *mediation* were explored in Chapter 3 and 4. In Chapter 3 I presented the idea of technologies *qua* scriptural forces. Today this is one way of explicating the notion of *technological mediation*. A number of readings of the idea of *script* were presented, and I argued that many technologies, from houses to speed bumps, are scripts in the sense that they are *material expressions of rules in the shared social environment*. By introducing the work of Foucault, as giving a 'script-like' analysis of the role of architectural design in the late Victorian period, a discussion concerning social power and social norms was introduced.

Developmental psychologists can evidence another understanding of the mediating relationship that contemporary technologies can play. They introduced the idea that technologies *qua* transitional objects, could allow their users to move from a state of dependence to a state of independence in the world. More defensive aspects of this process were presented in the guise of people forming attachments to technologies *qua* computers as a *flight from intimacy with human beings*. However, the more liberating and positive aspects of these scientific theories come from the studies of children's *intimate relationships* with machines. This studies proved a much higher level of *mediation* – the mediation of human subjectivity and emotional relationships. This basic ambivalence to technology was first seen by Heidegger, but the preliminary empirical studies about people's relationships with their computers, like virtual pets shed light on other attachments. Certain social groups form such strong emotional attachments to these playthings, that a large number of people seem to anthropomorphize their range of technological equipment that they use in their everyday lives. Here, one point of reflection is the way in which technology in contemporary societies is used for *leisure* in a way that would not have been so prevalent for Heidegger. I have demonstrated that the social, historical and cultural contexts which influenced Heidegger in inter-war Europe were different to the contexts of Ihde and Verbeek drawing on post-1960s America. These differences might provide some explanation of these approaches, but it seems that *identity* and *intimacy* can become salient concepts of investigation when technologies are used not just in the workplace, but also in the home and in everyday life. While this is a further point of investigation that falls outside the scope of this thesis, it does show that the concept of *intimacy* is particularly relevant when considering the relationships that people have with various kinds of technology and for a panoply of reasons outside of the workplace.

As has been shown in Chapter 5 new technologies do allow people to construct their *identities*. By introducing the work of Ricouer concerning *idem* and *ipse* identity, and premising the concept of *narratives of the self* as the locus in which these two aspects of identity form a coherent whole. It should be noted that Ricoeur offers a more detailed understanding of how technology actually can *mediate identities* than is described by

Heidegger, Ihde or Verbeek who do not concentrate on this area as a specific area of study. The notion of *profiling* was introduced, along with the concept of *reference groups* which can be real or imagined, but which underpin they way in which people think about and constitute their social identities or the sorts of people they aspire to be. Technologies do play a role of 'referential' groups, and we could understand identity as a feedback loop as *us profiling machines profiling us.* Therefore, the ideas of Foucault, especially his notion of technologies as *qua* apparatuses, allow their users to 'construct' a sense of self, to develop that self and to 'care for' the self. Using Foucault, I also raised a number of more complicated questions about identity, namely: autonomy, morality and control. These topics were explored and left to Chapter 6 because of their ethical relevance for the future of research in this area.

As some authors in this thesis have posited, smart technology, or the 'vision' of a world permeated by smart technology, has never really been materialized. One obvious consequence of this problem is that the theoretical reflection remains speculative, that empirical studies are rare and often explore limited variables with limited groups of study and that there are many conflicting theoretical approaches taken from a range of academic disciplines to explore the same – or similar – sorts of phenomena. Hence, over the course of this thesis, I have offered a selective sketch of the ideas of a number of thinkers on the role of *mediation* that technology plays for human subjects. These philosophers come from both 'phenomenological' and 'postphenomenological' orientations, and from both 'analytic' and 'continental' traditions. It has also been necessary to draw on the work of sociologists, cultural theorists, Artificial Intelligence research, Science and Technology Studies, developmental psychology and a range of empirical studies conducted by a number of different researchers. Hence, there is a need to develop a shared trans-disciplinary theoretical paradigm within which the relevant issues concerning technology can be discussed. This remains a challenge for those working within the broad field of the philosophy of technology in the future.

As was briefly touched on in Chapter 6, the tendency in relevant literature has been to 'flit' between dystopian and utopian scenarios regarding the introduction of AmI to

everyday environments. In part, this is understandable, as AmI does not yet permeate the social world in the same way as computers, telephones or cars. As I have pointed out in this thesis, new technologies always carry challenges and assumptions in their wake, often radically changing social practices, norms and values. However, these become *established* over time, and hence become *naturalized* or *normalized* parts of the shared social world – that is, they become "just how things are". In this sense, people do not tend to think that things like doors, fireplaces, computers, telephones or cars are somehow "taking over" the world, or that human beings are no longer ' in control' in particular ways of their own individual lives or more generally of their shared social or collective lives. However, cars, computers and phones, like aeroplanes, microscopes and nanotechnology, have made – and continue to make – a substantial contribution to human social and individual life. In this sense, I have introduced how the development of technology across human societies represents in general a *progression* for society, and for humanity. This broader sense of orientation towards technology and its place in society and affect on human life is often missing from discussions about technology.

In nearly all of the philosophers and thinkers examined throughout the course of this thesis there is a genuine *ambivalence* about technology. Traced from Heidegger, it is a viewpoint that developed in response to *modern* technology: a modernity that can be seen to be a broader consequence of the ambivalence that modernity in general gives way to. On the one hand, this ambivalence represents a liberation for technology. Technology 'in itself' is neither good nor bad; but *how* technology is used in situations of social practice is the key point. *In general* if social or public good is the aim, new technologies should be developed, irregardless of how these come to function in the shared social world. However, on the other hand, *modern* technology can be both *revealing* and *concealing* the world, to draw on Heideggerian terminology. Perhaps in an abstract sense, it is also possible to see the echo of this idea in Foucault's conceit because he believed technologies could function to either consolidate implicit dynamics of restrictive *social power*, or, that they could *liberate* the individual when used in a way where they allow the individual to elucidate an ethic of *care of the self*.

As this thesis has traced, the social situation of technologies has also shifted over the last century. I have suggested that more attention should be given to the *social*, cultural and political context of technology. Verbeek and also to a large extent Riceour and Foucault, have all perceived a number of barriers to the more "traditional" approaches to phenomenology and philosophy. While Verbeek approved the "empirical turn" taken by Ihde - Ricoeur and Foucault were concerned to show how the Cartesian dualism between "subject" and "object" is philosophically inadequate and sociologically incorrect. Yet, it is partly because of these reactions to the more 'traditional' or classical phenomenological or philosophical approaches, that two critical points of the AmI challenge can be explained: First, the focus on *individual* uses and experiences of technology by Ihde, Verbeek and Foucault allows theorists to talk *more generally* about the impact of technologies across society. Second, the absence of this more general perspective makes it very difficult to take a broader more general orientation towards technology. In short, the theoretical investigation must and has become very focused on *the individual.*

My role in this thesis has been to critically engage with this wider theoretical orientation. As has been suggested in Chapter 6, the complex role of technology as *qua mediator* of twenty-first century society means it is not only as a mediator of person and world, or of a Heideggerian concept of *Dasein*, but of *human subjectivity*, or *human identity*. For Heidegger, there was no 'pure' *Dasein* 'outside' the mediation by the objects, so it could be suggested that a large amount of conceptual confusion surrounding this point has led to the need to 'overcome' classical phenomenology. I have been particularly critical of Verbeek's notion that AmI technologies create some sort of 'posthuman' creature who is somehow not the 'pure' human of pre-technological societies. In this sense, I hold that the relationship between human beings and technology is in some ways like the fable of the woman who believed that the world was carried through space on the back of a turtle. When asked what the turtle was standing on, the woman is said to have replied: 'It' s turtles all the way down'. The fable is interesting, because it highlights the pitfalls of thinking in an overly mechanistic and one-sided way about relationships between us and objects. In the same way, there is no 'ultimate basis' outside the shared social world of

technology in which ‘humanity’ mysteriously resides. Heidegger grasped this more profound point and in some ways, it was not fully embraced by theorists such as Foucault and Verbeek.

Hence, technologies that are placed inside the body like heart valves, nanotechnologies, implants and microscopic organisms are significant developments. However, perhaps they do not ‘change’ or ‘transform’ our human-technology relationship in quite a radical way as it is claimed in the literature. As the insight of Heidegger claims human beings, human experience and *human subjectivity* is irreducibly and necessarily *mediated by* technology. Therefore, the more extreme conclusions by Verbeek and Foucault may be correct. In agreeance, I would suggest that it is important to be more critical of the idea that technological artifacts ‘have morality’ or that they ‘co-constitute human decision-making’ in a way that ‘strips away’ the moral autonomy and authority of the human being. In this sense, I tend to agree with a particular reading of technologies *qua* scriptural forces: that technologies can be said to embody emotional and authority laden scripts, but that these scripts are the material expressions of rules, which are given force by the wider social environment. This has led me to arrive at the idea that these rules *can be changed*.

In particular, this thesis has aspired to add to knowledge concerning the philosophy of technology as an academic field and to begin to illuminate the role of new smart technologies – ambient intelligence and persuasive technologies – in particular. At a more methodological level, the thesis has sharpened the concepts used in the discussion concerning technological mediation, aiming to provide a critique of the idea of 'mediation' in relation to new technologies. It has clarified the following concepts:

1. Mediation: understanding that intelligent technologies mediate *both* our individual and social lives, and that they do so in complex ways which point beyond a more 'traditional' understanding in the field of what might be loosely termed 'subject' vs. 'object'; in particular, a detailed exploration of the idea that technologies mediate our identities in new and significant ways, and the observation that human lives and society

are irreducibly technologically mediated.

2. Agency and Intentionality: understanding both of these concepts in the context of intelligent technologies, questioning and exploring to what extent – and in what way – it is possible to extend our concepts of 'agency' and 'intentionality' to technological objects, or rather, to certain technological objects in particular concepts of use. This involved a detailed discussion of Verbeek.

3. Responsibility: the thesis has maintained a strong emphasis on the idea that human beings have a responsibility for the particular technologies created at any particular time and that designers in particular shoulder some of this responsibility. It has articulated a rough set of guidelines for understanding this responsibility in design in practice; it has has also explored in some depth the idea of 'care of the self' to further illuminate personal responsibility in this area.

4. Morality: the thesis has taken the extant literature on this topic as a point of departure for a critical discussion of the ways in which intelligent technologies can be said to 'materialize morality' and the ways in which this might not be the case. It has argued that new technologies must be understood as functioning in specific social contexts of use, and that understanding the 'morality' of such uses is a complex and difficult matter. I have attempted to outline what I think are the relevant issues at hand in the broader moral discussion concerning the design and implications of ambient intelligence and persuasive technologies.

Moreover, the thesis has attempted to add to knowledge by expanding a number of ideas in the extant literature into the emerging field of intelligent technologies. In particular, it has aimed to show:

1. Scripts: that the concept of scripts might provide a useful framework for understanding the ways in which technologies can function in social circumstances where they play a role in a broader social practice. However, the thesis has also offered a critique of the way in which scripts are used in STS.

2. Reference groups: that the concept of reference groups provides a way of understanding the specific role of new smart technologies – especially the role of

'profiling technologies' – and the idea of the 'reference group' can be extended to cover the way in which certain smart technologies work in practice. In a relational and non-essentialist conception of identity, identity construction is based on a process of 'double anticipation' and this understanding allows us to investigate how: *the construction of our identity is mediated by us profiling machines profiling us.* In this sense, it is both possible and meaningful to consider certain types of AmI as playing the role of *reference groups* for individuals in practices of use, which importantly would in turn give rise to particular and distinctive kinds of phenomenological experience, specifically regarding identity.

3. Sketch of designer guidelines: this thesis has focused in particular on the construction of new smart technologies, and aimed to draw out the practical significance of the theoretical claims made wherever possible. It has tried to contribute to knowledge in this area by outlining a set of guidelines for AmI designers to follow, reflecting this thesis' distinctive explication of the concepts of morality, mediation and responsibility respectively. This set of guidelines holds that designers have part of what I have understood as a 'distributed responsibility' for the design of new smart technologies in the future.

In light of this thesis' investigation, there are a number of possible future areas of study that have come to light, and which may be indicative or otherwise useful for others working in the field. First, I have found that there is a relative lack of substantial empirical evidence into the functioning of AmI in particular contexts of use. It would be useful – for both designers and those writing academically – to outline a suitable and relevant empirical project to better substantiate the claims made in the literature, and to explore further the various mediating roles of AmI. This could take the form of a data-collecting exercise into the use of an already-existing product in a controlled study with two users, where significant variables investigated include the users' perceptions of 'intimacy' with the technology and whether this changes or develops over time. Second, I have been interested in particular to stress the public roles of new technologies; however, there is also little new data surrounding AmI in particular and the public's response to this technology. Again, a simple data-collecting exercise in the form of a questionnaire, sent to a relevant sample of the population, might be useful in assessing general attitudes

towards AmI in general and perceptions of intimacy and the formative role of technology more specifically.

This thesis has stressed in particular the idea that intelligent technologies can mediate identities in new and significant ways. To explore this in relationship to the idea of intimacy further, more theorization is necessary, in particular based on empirical data.

Finally, it is possible to agree with Foucault that there is nothing wrong with using technologies on an individual level to aesthetize oneself in a 'care of the self'. However, new questions about technology must be posed in a way that goes beyond the individual and individual experience in isolation from society. Therefore, I have premised the *irreducibly social* function and aspect of new technologies and I urge a more protracted and genuine *public* discussion about how they are used and what they mean.

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Appendix

1 Cd-rom with word-file including active links to the online research archive.

http://playstudies.wordpress.com/?s=living+tomorrow

http://playstudies.wordpress.com/?s=ambient+intelligence

http://playstudies.wordpress.com/?s=internet+of+things

http://playstudies.wordpress.com/?s=latour

http://playstudies.wordpress.com/?s=artificial+companions

http://playstudies.wordpress.com/?s=persuasive+mirror

http://playstudies.wordpress.com/?s=house_n

http://playstudies.wordpress.com/?s=placelab

http://playstudies.wordpress.com/?s=evidence+locker