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Cognitive and social interaction in cyberspace:

Prosthetic functions of the Internet

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This is a qualitative social constructivist research of individuals living in the area of Bergen and their daily Internet use. I argue that we are living in a prosthetic culture within the cyberculture. Cyberspace is influenced by offline environmental space and humans interconnect with the Internet and ICT-devices; humans interact with other humans through cyberspace, constructing what I have referred to as *social/wired cyborgs*. Moreover, humans may socially distribute their individual cognition online. I have studied informant's lives in cyberspace through the phenomenology of perception and how the Internet enhances and extended their cognitive, social, and motor skills/abilities. In addition my research consists of three individuals with reduced mobility and four able-bodied individuals.

Key words: Cyborg, Cyberspace, ICT, Phenomenology, Cognition, De-compartmentalize

Dette er en kvalitativ sosial konstruktiv forskning av personer som bor i Bergen og deres daglige internettbruk. Jeg argumenterer for at vi bor i en prostetisk kultur innen cykerkulturen. Kyberspace er influert av offline miljø og mennesker er Inter tilkoblet til internett og IKT-enheter; mennesker samhandler med andre mennesker gjennom kyberspace, og konstruere det jeg har referert til som *sosial/wired kyborgere* . Videre, så kan mennesker kan distribuere sin individuelle kognisjon online. Jeg har studert informanters liv i kyberspace gjennom fenomenologisk persepsjon og hvordan internett styrker og forlenger dere kognitive, sosiale, og motoriske evner. I tillegg så består min forskning av tre person med redusert mobilitet og fire funksjonsfriske personer.

Nøkkelord: Kyborg, Kyberspace, ICT, Fenomenologi, Kognisjon, De-kompartmentalisering

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1.0 Introduction

In the 21th century human relationship with information and communication technologies have increased. Humans are interconnected to these technologies in order to enhance our abilities and capabilities in life. In fact humans have always used tools or objects as extensions. These extensions have a prosthetic function; thus we are living in a prosthetic culture. The basic understanding of a prosthetic culture is that individuals use tools or objects from their contemporary culture as extensions to their physical or cognitive capabilities and abilities. Hence the interconnection between humans and objects is the prosthetic culture (Lury 1998). Celia Lury (1998) at the University of Warwick explains that changes in society constitute a prosthetic culture. From the perspectives of Euro-American societies of the Renaissance to the Enlightenment and beyond it is the "experimentation" of "self-identity" (1998, 1) that Lury calls a prosthetic culture. The essence of self-identity is that of free will, however this notion, as pointed out by Lury, is "historically specific" (1998, 1), which means that the definition of identity differs in various contexts. The *prosthetics* in prosthetic culture can be applied to use of objects. Prosthetics is an ambiguous term that refers to a device that extends or substitutes the body, either internally or externally. The term can be applied to medical terms or general terms, as well as in metaphorical contexts. Prosthetics used in a medical context is a device that substitute or replace a defective or missing limb, such as a leg, a tooth, artificial hip or a hearing aide. These prosthetics are either removable or integrated inside the body. There are different types of prosthetics, either limb, perceptual, or cognitive prosthetics. These prosthetics can extend or incorporate the body (Marquard Smith and Morra 2006, 4). The scopes of prosthetics have different purposes and should not be treated in the same manner. Examples of prosthetics are internal or external limbs, glasses, wheelchair, a computer, or digital communication. Prosthetics can be perceived materially and metaphorically and the latter use has previously been criticized for romanticizing the use of prosthetics. Marquard Smith and Joanne Morra, the editor of *The Prosthetic Impulse: from a posthuman present to a biocultural future* point out that we have a *prosthetic impulse*,

where human eager to "make (human) contact with a modern world that is ever more mediated and determined by communication technologies, biomedicine, and information" (2006, 4). In other words the prosthetic impulse drives a prosthetic culture. Individuals' impulses to mediate and adapt to modern technologies in order to extend our natural senses thus construct a prosthetic culture.

The cinema and media theorist Vivian Sobchack has written a chapter called "A leg to stand on: prosthetics, metaphor, and materiality" in the book *The prosthetic impulse* where she discusses how a romantization of the term prosthetics could defeat its purpose:

> Sometime, fairly recently, after the cyborg became somewhat tired and tiresome from academic overuse, we started to hear and read about the prosthetic - less as a specific material replacement of a missing limb or body part than as a sexy new metaphor that, whether noun or (more frequently) adjective, has become tropological currency for describing a vague and shifting constellation of relationships among bodies, technologies, and subjectivities (Sobchack 2006, 19)

The original definition of prosthesis described the English language, and the anthropologist Sarah S. Jain (1999) points out that the literary meaning of prosthesis is by "adding a syllable to the beginning of a word"; thus prostheses were originally grammar auxiliaries, but later added a medical approach as well. Jain argues that how the body's relationship with technologies is discussed as metaphorical prostheses easily become a trope representing the transition from "medical to metaphorical" which refers to bodies that are not "whole" (Jain 1999, 47-48). Ultimately, the trope may "elide or defer" (Jain 1999, 48) questions regarding the wholeness of bodies in our society. In other words, Jain is concerned that the metaphorical use of prosthesis will replace bodily discourses involving how the disabled bodied is discussed in society. The disabled body include "[r]aced bodies", "aged bodies" and "gendered bodies", in addition to the "physically disabled body" (Jain 1999, 48); and the prosthesis (tool) in this context is used as means to repair the body. This notion of the metaphorical prosthetic use is what Jain is criticizing. There is also a grammatical difference between applying the term prosthesis/es as opposed to prosthetics because the first is a noun while the latter is an adjective. So, while I am using the adjective, Jain is using the noun when discussing the term. The *meaning* of the prosthetics is essential and constitutes the individual as well as multiple purposes of the prosthetics. Sobchack points out that the modern interpretation of the prosthetic has less to do with the material prosthetic; rather it is typically

used metaphorically. Prosthetics are often connected to disability and the notion of an impaired body. Supposedly, prosthetics are meant to fix the disabled body as if the disability was a "problem" in the first place. As pointed out by the editors of the book *Corporealities: Discourses of Disability* David T. Mitchell and Sharon L. Snyder "[t]he perception of a crisis or a special situation has made disabled people the subject of not only governmental politics and social programs but also a primary object of literary representation" (Mitchell and Snyder 2000). The "crisis" and "special situation" referred to how disabled people have been treated as different in cultural aspects which have separated them from the society as whole. Furthermore there are two ways for the literary representation: "We term this perpetual discursive dependency upon disability *narrative prosthesis*. Disability lends a distinctive idiosyncrasy to any character that differentiates the anonymous background of the norm" (2000, 48). The norm of the disabled body is represented as a "materiality of metaphor" (2000, 61). In narrative literature the mind is often separated from the disabled body in order to describe the abnormality of the body, and the body is thus narrated "outside the norm" of society. Mitchell and Snyder (2000) explain that the body has typically been used as a metaphor in narrative literature to "form a textual embodiment" (2000, 62). "The desire to access the seeming solidarity of the body's materiality offers representational literatures a way of grasping that which is most unavailable to them" (2000, 63). The narrative prosthetic thus acts as an auxiliary to grasp knowledge involving bodily perspectives in society. Further, Mitchell and Snyder argue that this bodily metaphor provides the narrative literature a way to show the materiality behind the metaphor:

> The corporeal metaphor offers narrative the one thing it cannot possess –an anchor in materiality. Such a process embodies the materiality of metaphor; and literature is the writing that aims to concretize theory through its ability to provide an embodied account of physical, sensory life (2000, 63).

In this way the body is used to describe materiality in connection to contemporary societies. So elaborating further on Sobchack's definition of prosthetic metaphors above, as something that is distant from materiality; the metaphor might as well grasp the notion of materiality as something that is connected to the body through the society. As pointed out by Professor Tim Dant (2005) "[t]he materiality of society is usually engaged with on an individual basis because it is the meeting of body and object that constitutes the relationships" (Dant 2005, 3). This meeting of the body and objects is the embodied relationship between individuals and objects. Objects represent ideas of society to humans individually.

I will use the term *prosthetics* as a metaphor to describe how humans interact with non-humans and machines, in particular the Internet, in order to enhance our natural abilities and capabilities developed from our birth. In this respect I will not discuss the prosthetic as a material object that replaces impaired body parts or impairment in general, but rather used in a way that enhances our natural perceptive and cognitive abilities and capabilities in despite of body politics of disability. The body politics of disability and impairment involve concepts and issues involving *normalcy*. The disability studies researcher Lennard J. Davies (2002) points out that the term normality or what constitutes being normal, derived from modernity from the eighteenth century and onwards. Moreover, Davies (2002) links normalcy and language, "linguistic standardization", together which are connected to the modern period where the linguistic standardization homogenized "the modern nation-state" (2002, 101):

> Without this linguistic homogeneity, the notion of the modern nation-state would have had great difficulty coming into being. In addition, national literatures, both in prose and poetry, were made possible through the standardization of languages, the prescriptive creation of normal language practices (Davies 2002, 101)

Moreover, Davies takes the politics of modern linguistics in literature further by adding "that for the formation of the modern nation-state not simply language but also bodies and bodily practices had to be standardized, homogenized, and normalized" (Davies 2002, 101). By extension Davis draws parallels to the original meaning of *prosthetics/prostheses* with the modern practice of the term to construct body politics in relation to the society's modernized definition of ableism. Hence, society needs "to move away from the victim-victimizer scenario" of ableism and other –isms in order to increase knowledge about individual agency viewed "as an aspect of political and social practice that have both positive and negative implications" (Davies 2002, 102). So, how the agency of society as a whole function in practice may be more relevant than to distinguish between what should be standardized or normalized in society. With this metaphorical use he avoids the trope of "sexy metaphors" discussed above. The prosthetics in my thesis does not only involve the disabled body but also the abled body, because the Internet, which I believe to function as a prosthetic to human brains, enhance human's cognitive and perceptive skills. These skills represent our communication and information abilities. The modern prosthetic culture is thus intertwined with cybernetics. The body politics and social agency of Internet use viewed within a cyberculture can serve the purpose of understanding how digital technology…

Although Shobshack refers to prosthetics as a replacement for the *cyborg*, I disagree with this notion. The modern prosthetic culture is intertwined with *cybernetics*. A subcategory within the prosthetic culture is the cyberculture, and the *cyber* has derived from *cybernetics*. The term cyborg was coined by the scientists Manfred E. Clynes and Nathan S. Kline in the essay "Cyborg sand Space"*;* and was later interpreted by scholars and researchers such as Donna Haraway in her "Cyborg manifesto" from 1985. The cyborg is a shortened term of *cybernetic organism*. The concept of a cyborg was originally a way to describe how humans could live in hostile environments by constructing an "artificial atmosphere" in order to be able to survive "extraterrestrial conditions" in space, by altering human's "homeostatic mechanisms" (Hables Grey et al 1995, 30). Clynes and Kline pointed out that in order for the homeostatic mechanisms to function properly while traveling in space the machine must run automatically, so the human does not become "a slave to the machine" (Hables Grey et al 1995, 31). "The purpose of the of the Cyborg, as well as his own homeostatic systems, is to provide an organizational system in which such robot-like problems are taken care of automatically and unconsciously, leaving man free to explore, to create, to think, and to feel" (Hables Grey et al 1995, 31). Essentially the idea is to incorporate and augment the human nervous system in a manner that human and machine are intertwined but human should still be in charge of the machine. The concept of a cyborg can be applied to contemporary societies and humans relationship towards technologies. The scholar Donna Haraway defines the cyborg as "a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction" (Haraway 1991, 149). To elaborate further, a cyborg is a human who enhances their human natural skills with artificial modern technologies in contemporary societies. The interconnection between human and machine is the construction of hybrids. Although Haraway does not discuss the Internet in her Manifesto, parallels between the hybrid living in a social reality and humans interacting in cyberspace are possible to draw. Moreover, Haraway says that "the cyborg is our ontology" (1991, 150); which indicates that the interconnection between human and machine/non-human constructs human nature. Modern technologies blur the line between biology and the artificial thus constructing relations between humans and technologies. However, humans are not born cyborgs, but become cyborgs through the society we are living in which thus construct cyborgs. In my point of view the contemporary prosthetic culture we are currently living in is constituted by human interaction with digital technologies. Even before digital media, the media was described as a prosthetic or augmentation to humans. The media theorist Marshall McLuhan suggested in *Understanding Media: The extension of man* that the medium is an extension of

humans. By extension McLuhan defined the medium as modern technology from newspapers to light bulbs (10). Moreover, he suggested that the medium in itself changes and alters the society. However, McLuhan suggests that technologies are "pure information". "It is a medium without a message, as it were, unless it is used to spell out some verbal ad or name" (10). Elaborating further "the content of any medium is always another medium", such as written communication and information is the content of the Internet which is a medium, which may be extended further. Moreover, McLuhan claimed that the mechanical industry changed attitudes towards how humans perceive themselves in society. "It explores the contours of our own extended beings in our technologies, seeking the principle of intelligibility in each of them" (8). According to McLuhan electronic technologies extend humans individually, thus need to be examined on a deeper lever. The attitude towards technological extensions and enhancement are present in our Internet society as well. Humans tend to adapt and adopt technologies in order to conduct specific tasks more efficiently. Modern technologies function as extension of both mind and body, and the purpose of these technologies may act as embodiment. The most ground breaking technologies of them all, though, have been recognized as the human language. Language is a form of communication; oral, verbal and/or written language. Communication can be mediated through modern technologies, in previous years digital communication have been created. Mediated communication is often referred to as a contrast to face-to-face communication. Digital communication has developed from written communication and originates from "cave paintings from the prehistorical time" (Meinel and Sack 2014, 18). As explained by the social-scientists Christoph Meinel and Harald Sack "[w]ith language as the innate means of direct and indirect communication between people […], the human memory was initially the only aid in keeping and fixing communicated information" (2014, 18). The cave paintings were a means to "preserve messages […] visually" (Meinel and Sack 2014, 18), likewise to how we preserve written communication online which can be retrieved for later purposes. A transformation occurred "from the pictograph of the icon to the phonetic characters" of script (Meinel and Sack 2014, 18) used today. With the phonetic character the language arose, which is the utter form of human communication. Language is a cognitive tool which assists to communicate with individuals. Moreover, digital communication is an electric way to transmit information typically through the Internet and WWW (2014, 15), which connect individuals through a network. Hence, mediated communication or interaction embodies human social interactivity and skills.

In modern times, I suggest that humans are embodied through use of digital communication as a prosthetic in order to enhance and maintain contact with other individuals. As pointed out by the sociologist Manuel Castells (2004) the Internet has provided us with a (social) network society. The Internet originates from the 1960s with roots from U.S.'s Department of Defense's Advanced Research Projects Agency Networks, ARPANET, which was the earliest network to implement Transmission Control Protocol/Internet Protocol, TCP/IP, that interconnected networks (Waldrop 2008, 85). Moreover, the Internet allows individuals to connect by constructing networks consisting of individuals. According to Castells there were "three major features of networks that benefitted from technological environment: flexibility, scalability and survivability" (2004, 6) which allow the connection of the networks to function. Thus, networks can reconfigurate, change in size and consist of nodes with no center. The most important factor for networks to exist, though, is of course that humans maintain the networks. The network society is part of our cyberculture. Cyberculture has been defined by the American critic Mark Dery in this way:

> A far flung-loosely-knit complex of sublegitimate, alternative, and positional subcultures whose common project is the subversive use of technocommodities often framed by radical body politics… Cyberculture is divisible into several major territories: visionary technology, fringe science, avant-garde art, and pop culture (Dery 1992, 509).

This overview of cyberculture illustrates how the term arose through emergence of popular and mainstream subcultures connected to modern technologies, such as digital culture. In addition the editor of *Cyberculture Theorist* suggest that Dery's description of subcultures could be re-defined as cybersubcultures, and further adds an expansive definition of the term: "to denote a number of things simultaneously, as reflected in the breadth and diversity of topics and emphases stretched across the subject" (2007, 5). Bell also explains that "cyberculture is a way of thinking about how people and digital technologies interact – how we *live together*" in cyberspace (2007, 5). So, to elaborate further cyberculture describes how individuals socially interact with digital technologies in a network society. The term network society has been known through Castells with roots in capitalism and to build a new economy (2000). Castells also relate the network society to communication and interactivity through "electronic media use, including the Internet" (2004, 45) in "the construction of a shared cultural practice that allows individuals and social groups to live together" (2004, 46). When I use the term networks it defines the networked connection the Internet provides users

individually. Furthermore, human interaction in cyberspace has constructed what I will refer to as (partial) wired/social cyborgs that interact with other individuals through digital communication using ICT-devices such as PC/Mac, smartphone, and iPad. By extension cyberspace has an ambiguous and metaphorical use; a place individuals access through the Internet. I will use the term cyberspace to describe the space where humans interact with other individuals digitally. This space has influenced environmental/offline-space and is rapidly increasing because of portable devices used to access the Internet.

Although the presence of bodies in cyberspace is different than the environmental space, the body is still represented through phenomenological perceptions. Phenomenology of perception evolved from phenomenologists like Edmund Husserl and Maurice Merleau-Ponty, which describes how individuals perceive themselves in the world (). Since Merleau-Ponty's definition of phenomenology has evolved, today the concept of phenomenology is connected to perception as well as cognition. Both perception and cognition are connected to each other and perception is a cognitive process of human senses (Wang 2007, 1-2). Individual cognition can be distributed socially which connects individuals together such as in a social network (Hutchnins 2000). Frederique de Vignemont and Farnè Alessandro discuss how humans speak of tools as a representation of themselves, such as stating that "I am parked at the corner of […]" (2010, 2), when the car is parked there. Suggested by Vignemont and Alessandro "this may be more than a mere linguistic shortcut" (2010, 2); humans tend to confuse the "dimensions" of the tools, such as the car, with their own "bodily dimensions" (2010, 2). Essentially, "body representations can stretch to include allograft, prostheses, rubber hands, virtual avatars and tools". This indicates that "what is embodied can be in flesh and blood, in rubber, in metals, or even completely virtual" (2010, 2). Adapting this definition of bodily dimensions to Internet use thus suggest that our cognitive skills represent our bodies in cyberspace. Vignemont and Farnè's have interpreted tools as incorporated into our body schema, where our bodily dimension and the tools dimension are intertwined. The prosthetics culture sheds light on this bodily and cognitive interaction with tools in contemporary societies, such as the interactions in cyberspace.

There is a stereotypical tendency among lay individuals as well as scholars to de-compartmentalize disability on the one side and able-bodied on the other side when discussing use of technologies. Elaborately, use of modern technologies may often be perceived from an assistive point of view in cases involving disabled individuals, however, the case is typically different involving able-bodied individuals (Moser 2006, Freund 2010). With my study I want

to illustrate that the way individuals use the Internet is not defined by disabilities or abilities, however, personal factors of people's identity affect how they perceive themselves online.

1.1 Research topic

To sum up my research topic is the contemporary prosthetic culture of cyberculture. There are several concepts that constitute the cyberculture, such as "visionary technology, fringe science, avant-garde art, and pop culture" (Dery 1992, 509). I will discuss cyberculture as part of a cybernetic society within the prosthetic culture. The notion of a prosthetic culture is human's adaption to objects/technologies in a specific contemporary culture. Hence, human's relations to technologies are intertwined, likewise with the cyborg figure which is part human and part machine. Even if the Internet does not literally construct us into becoming hybrids of machine and flesh, as Internet users we are interconnected through cyberspace. My suggestion is that this interconnection has shaped us into becoming social/wired cyborgs. As a process of my research I have researched a group of individuals living in the area of Bergen as an inquiry to research their daily Internet use. The group represents both individuals with reduced mobility and individuals who are able-bodied. Deliberately, this is way to de-compartmentalize disabled bodies use of the Internet separately from able-bodied to avoid fixed assumptions that digital technologies are used in assistive ways to disabled bodied, but not to able-bodied individuals.

In my thesis I will start by discussing the background of our cyberculture to connect it with the network society which humans are living in. Moreover, I will discuss how the (inter)connecting between humans and the Internet/cyberspace have made us function as (wired/social) cyborgs and where the cyborg notion/concept comes from. In addition, how individuals connect through the Internet is a social phenomenon whereas we distribute our individual cognition online. This social distribution is important in connection to how humans interact through the Internet. In the third chapter my methodology will be presented and discussed in relation to a social constructivist perspective, which is the grounded methodology that is chosen for the analysis of the interviews conducted. The analysis chapter is separated into three sections which describe different approaches of Internet extensions and enhancement through cognitive, perceptive, motor and sensory skills, abilities and capabilities. In the last chapter I will provide/suggest possibilities my research offer; followed by a futuristic aspect of the Internet and other cyborg technologies. Lastly, I will sum up my results in a conclusion.

2.0 Prosthetic culture – cyberculture

The aim of this chapter is as an overall view on how our society is affected by the prosthetic culture in relation to the information/digital age. The prosthetic culture has been through a transformation, recently. As pointed out by the theorist Fred Turner (2006) our society has shifted from a counterculture to a cyberculture. In short there are several ways to view a counterculture; to some scholars it "is a culture antithetical to the technologies and social structures powering the cold war state and its defense industries" (2006, 3). This version of a counterculture resembles a technological determinist view. Technological determinism was originally coined by Thorstein Veblen, however many scholars and scientists have followed in his footsteps. The main idea of this reductionist theory is to explain social changes through technological developments in media and society as a whole. These changes are thus believed to affect society in various degrees, either on a negative or a positive level. If these changes are believed to have a negative impact on an individual with deterministic views, the individual will thus avoid use of these technologies (Baym 2010, 27). Another aspect of a counterculture is "institutions as living organisms, social networks as webs of information, and the gathering and interpretation of information as keys to understanding not only the technical but also the natural and social worlds" (Turner 2006, 4). This counterculture arose in the U.S. during the 60-70s as a result of mainstream American politics during the Vietnam War. However, some people broke away of this system and organized themselves in groups to demonstrate against this war culture. Essentially, the counterculture represented what Turner refers to as the New Communalists. "For this wing of the counterculture, the technological and intellectual input of American research culture held enormous appeal" (Turner 2006, 4). One man who influenced the people in the counterculture was the media theorist Marshall McLuhan, mentioned in my introduction above. "Through their writings, young Americans encountered a cybernetic vision of the world, one in which material reality could be imagined as an information system" (Turner 2006, 5).What inspired them was the utopian image of "global harmony" (Turner 2006, 5). The notion of cybernetics became popular amongst the community called the Whole Earth in the 1960s. Stewart Brand founded several organizations within the community. Turner quotes the sociologist Ronald Burt who refers to Brand as a "network entrepreneur". His reason for this is that "he began to migrate from one intellectual community to another, and in the process, to knit together formerly separate intellectual and social networks" (2006, 5). These networks expanded and started to include more groups, such as "scientific research, hippie homesteading, ecology, and mainstream consumer culture"

(Turner 2006, 5). Emphasized by Brand (1995) the "hippies" constructed the cyberculture. The "hippies" were nerds and computer hackers with an attitude of: "Ask not what the country can do for you. Do it yourself" (Brand 1995) retold by President J.F.K. The hackers represented three generations:

> In the 1960s and early '70s, the first generation of hackers emerged in university computer-science departments. They transformed mainframes into virtual personal computers, using a technique called time sharing that provided widespread access to computers. Then in the late '70s, the second generation invented and manufactured the personal computer. The third generation of revolutionaries, the software hackers of the early '80s, created the application, education and entertainment programs for personal computers. Typical was Mitch Kapor, a former transcendental-meditation teacher, who gave us the spreadsheet program (Brand 1995)

These three generations of hackers shaped the cyberculture as we know it today.Moreover, the network society that the Internet provided changed and shaped the mainstream society. In theory Brand functioned as a social prosthetic to these communities and connected all of them together. SPS (Social Prosthetics Systems) coined by Stephen M. Kosslyn (2006) illustrate how individuals function as prosthetics to each other and can be applied to Brand's networking skills. He extended the Whole Earth catalogue era and established relationships across communities, and created a social network of communities; each of them is a node in the network. To a certain extent he functioned as a cybernetic organism; hence a social or wired cyborg. As Haraway points out: "Cyborgs do not stay still. Already in the few decades that they have existed, they have mutated, in fact and fiction, into second-order entities like genomic and electronic databases and the other denizens of the zone called cyberspace" (1995, xix). The notion of a cyborg changes in time because technology evolves. The figure of a cyborg can now represent the social network society existing in cyberspace. The social network theorist Manuel Castells (2004) points out that a transition from industrialism to informationalism has occurred:

> Informationalism is a technological paradigm based on the augmentation of the human capacity of information processing and communication made possible by the revolutions in microelectronics, software, and genetic engineering. Computers and digital communications are the most direct expressions of this revolution (Castells 2004, 11).

Castells explains a shift in society where human's memory/cognition is augmented by ICT-devices. Thus, the electronic and digital technologies enhance human interaction and merge the human and non-human together. The cyborgs have mutated, as quoted by Haraway, into the era of informationalism. The upshot of informationalism is a cybernetic enlightenment. Within the cyborg society Informationalism is a part of the cyborg society, whereas technological interaction and interconnection is central. Cyborgs think beyond humans and are thus referred to as posthuman species. In essence cyborgs represent contemporary society's use of technologies. Human and cybernetic interaction started to take shape in the aftermath of the cold war, and cybernetic system eventually became intertwined into a postmodern society, represented by the cyberculture.

Brand's counterculture fought for individuality in the cold war era. They all feared a nuclear war and political decisions that would change the society into a collective of people all behaving the same way. "Brand came to appreciate cybernetics as an intellectual framework and as a social practice: he associated both with alternative forms of communal organizations" (Turner 2006, 43). An alternative to the war politics was presented through biological and ecological studies at universities. The alternative involved evolution studies. The professor Paul Ehrlich was an inspiration to Brand. He focused on "systems-oriented models of the natural world" (Turner 2006, 44). Ehrlich published a book called *The process of evolution* with Richard Holm. As Turner explains:

> Ehrlich and Holm deliberately de-emphasized taxonomic ideas such as species and subspecies. Instead of a world arrayed in Linnaean hierarchies, they offered a vision of life as a complex energy-matter nexus. Individuals, populations, and the landscapes they inhabited were entwined in constant exchanges – exchanges so pervasive that, as in the case of algae and fungi, individuals were sometimes hard to distinguish from whole populations. For Ehrlich and Holm, the classic dualities of mind and matter, actor and action, masked a series of more essential truths: individuals were elements within systems and were systems in their own right. As such, they both responded to and helped shape the flows of energy that governed all matter. This was also true for humans at the cultural level: according to Ehrlich and Holm culture had grown out of man's biological evolution and had become a force through which humans could recursively influence their biological development (2006, 44).

Hence Ehrlich and Holm offered an intellectual alternative to a possible third world war. This alternative involved a network of individuals who all cooperated on a greater level. As mentioned above by Manuel Castells a shift in society occurred. The system, which is described in the quote above, resembles a social network which has grown out of man's biological evolution and into a digital network by using cybernetic technologies. Several researchers and theorists, such as Marshall McLuhan were also interested in cybernetics and communication, which the art world was influenced by and grew fond of the idea of a global community. This community was connected through electronic media, which was believed to extend human space. At that time (1950-1970) the electronic media were first and foremost the TV and the radio. Electronic technology had the honor of changing the hierarchical society (Turner 2006). In the beginning the media was a one-to-many communication through mass-media, however social media changed the mass-media into a many-to-many communication platform. Today, the Internet and the World Wide Web have evolved human's social network and have created a global society, through digital networks. Castells points out that the network society is a "global society" although most people are not included. "But everybody is affected by the processes that take place in the global networks of this dominant social structure. This is because, the core activities that shape and control human life in every corner of the planet, are organized in these global networks" (Castells 2006, 33). Examples of the activities and organizations are NGO, economy, finance, "communication media, science and technology, culture, art, sports" (2006, 33). The network society is affected by the material world, and the boundaries of the network "change over time" (34). According to Castells there are three factors to take into consideration in the network society. The fact that it changes over time, "the core activities", and interaction between the networks which occur outside "the global networking logic" (Castells 2006, 35). In other words the core activities, such as work, spare time and change the structure of society as a whole. The material or the physical space is in certain aspects intertwined with cyberspace. Cyberspace is an ambiguous term and was basically coined by William Gibson in his novel Neuromancer from 1986. He referred to cyberspace as a cybernetic space in a virtual reality (1986). However, more recently the term is defined by the philosopher Michael Heim: "Cyberspace suggests a computerized dimension where we move information about and where we find our way around data" (1993, 77-78). This is a general definition, but describes the purpose of the Internet society. Today, cyberspace consists of several ICT-devices including the computer, such as smartphones and iPads. Informationalism and the social network society are part of this space. I will use the term cyberspace to describe and

refer to digital ICT-devices, the Internet, the World Wide Web and the network society as part of a virtual or material space. The cyberculture started out as a counterculture, which eventually changed into a mainstream society. Within the cyberculture, the notion of public and private space became blurred, because the Internet is a public space which can be accessed in the private space at home. It is important to know the background to how the cyberculture arose, because the cyborg concepts are also connected to politics and contemporary society. As illustrated by Haraway, in her *Cyborg Manifesto* a cyborg society confuses the boundaries between the material and the political society (1991, 153). Hence, a cyborg is affected by the contemporary society as a whole.

Social scientist Jacub Macek (2005) illustrate that there are four current concepts of cyberculture: "*utopian, information, anthropological,* and *epistemological concepts*" in his article *Defining Cyberculture*. These four concepts illustrate the most central features of modern cyberculture. The utopian aspect has roots in cyberpunk literature, which will be discussed further below in 2.1. The information is linked to cybernetics and ICT, as pointed out by Castells information and communication technologies show social implications to society. The reason is for these implications are explained as follows:

> [B]ecause information and communication are at the core of human action, the transformation of the technological instrument of knowledge generation, information processing, and communication has far reaching implications, which add specific social effects to the broader pattern of social causation (1).

The social process evolved through three decades from the1970-1990s. Although the social implication varies with degree depending on "countries, cultures, social groups", "all countries and all people, are directly or indirectly, exposed to the structural transformation mediated by this technological revolution" (1). Essentially, ICT affect the global society, and groups in society connected to the core activities of society, mentioned above. These social implications are factors of the contemporary prosthetic society of a networked society.

Living in a cyberculture, the scholar Sherry Turkle (2006) has pointed out that we review communication devices similar to the discussion of Vignemont's and Alessandro's linguistic discussion of how we express ourselves in relation to technology that we use, such as the car example of how we incorporate the bodily space of the car as our own bodily space. From the point of view of communication devices Turkle elaborates further that our relationship to communication devices "suggest a new placement of the subject" and "suggest a new place

for the situation of a *tethered* self' (2006, 2). When we talk about communication devices we typically express that we are on the Internet or on the phone, for instance, suggesting that we are connected or tethered to ICT-devices, likewise to my definition of social/wired cyborgs.

2.1 We are [all] cyborgs

Based on definitions and descriptions of the cyborg concept and how the figure changes in time as previously mentioned, I want to argue as expressed above that people who use the Internet are social or wired cyborgs. This notion of a cyborg figure is different from a person with physical prosthetics, such as a prosthetic arm or a hip; however I want to point out that the use of a cybernetic network can enhance people's cognitive and social skills thus the network extends our communication and memory. Humans and objects have always been interconnected, and humans have adopted objects as means of enhancement and extensions of the body and mind. The hybrid notion of the cyborg as part human and part machine is a means to describe how humans are adapting to new technology. The Internet connects humans together through social networks, at the same time the Internet connects humans and machine relations. Hence, I want to argue that this human and machine interaction is what makes us appear as what I have chosen to call wired or social cyborgs. This definition is different from the utopic concept of the cyborg where technology can separate mind and body completely and thus create a full disembodiment through use of modern technology. The ultimate goal would be to merge human intelligence with artificial intelligence, which would create singularity between the natural and the artificial world. Examples of the utopic or dystopic concept of technological disembodiment are presented by theorists and scientists such as Ray Kurzweil. He claims that the singularity is near and has published a book with the title *The Singularity is Near: When Humans Transcend Biology* where he discusses technological singularity. The technological singularity, which he describes suggest that in 2045 artificial intelligence (e.g. computer) and human intelligence will merge into each other. In short technological singularity is a hypothesis that suggests that at one specific point in time artificial intelligence will become greater than our intelligence which will change the human society. This artificial intelligence will thus enhance the human brain. Concepts like this hypothesis resemble a utopic or dystopic society such as the cyborg society. Technological singularity would merge human and machine and create cyborgs equal to how they are described and presented in the popular culture of science fiction, such as I,Robot, Robocop and Blade Runner. I, Robot is a short story collection published by Isaac Asimov (1950), and a movie based on the book was released in 2004. Robocop and Blade Runner are

dystopian films who involve artificial intelligence (Imdb). The cyborg concept is often illustrated through science fiction, where the perception of technological disembodiment is in focus and cyberspace is typically illustrated as a space that separates mind and body. The Internet as we know it today is often referred to as cyberspace or part of cyberspace, nevertheless it does not provide a technological disembodiment portrayed in science fiction literature.

Kurzweil has been criticized by other theorists and scientists. One criticism of Kurzweil's hypothesis is the exponential growth fallacy. According to the scientist Paul Davies "[t]he key point about exponential growth is that it never lasts" (2006, 421). "But this sobering fact has not stopped futurologist and author Ray Kurzweil from invoking exponential, and even hyper-exponential, growth in the realm of information processing" (2006, 421). Davies goes on to question what will happen when humans live in cyberspace. Kurzweil defenses his claim with the statement that we should "move into space". Davies on the other hand argues against this idea with "the laws of physics" which will not allow the information processing to be spread throughout the universe in the speed of light or defy gravity (2006, 421).

I partially agree with the criticism and believe that the Internet as we know it today will not change drastically in a short amount of time. Although cyberspace is increasing because of mobile technology that allows people to travel side by side with environmental space and cyberspace, we are not living in cyberspace permanently. However, as already mentioned we are living in a network society and the Internet allows us to interact with people in digital networks and to find information to increase our knowledge. Hence, the Internet connects humans and non-humans together. A bridge between the environmental space and cyberspace is created which enhances human connection. Cybernetic organisms live in networked societies of communication. Gray et al claims that we are living in a cyborg society and defines the cyborg society in this way:

> Even if many individuals in the industrial and post-industrial countries aren't full cyborgs, we certainly all live in a cyborg society. Machines are intimately interfaced with humans on almost every level of existence not only in the West and Japan but among the elite in every country of the world. Cyborg society also refers to the full range of intimate organic-machinic relations, from the man-machine weapons systems of the postmodern military to the rat-cyborg portrayed in [Clines and Kline's] article where the term was coined […], to the genetically engineered mice of today to

> biocomputers, artificial life programs, and any future extravaganzas like the plant-intelligent-machine symbiosis in Lois Gresh/ Digital Pistil (1995, 3).

When connecting the cyborg society to the network society I agree with this definition that we live in a cyborg society. The social network connects individuals globally, as discussed above, via "intimate organic-machinic relation". The counterculture which eventually evolved into the cyberculture wanted a society without bureaucratic hierarchies. Haraway's cyborg society is a concept of a community without bureaucratic distinctions. The early network society was a hierarchical society with a "one-way flow of transmission of information and instruction" (Castells 2006, 5). However, as pointed out in the introduction "[t]hree major features" changed the network society: flexibility, scalability, and survivability" (2006, 6). First, they can change; second they can expand or shrink, and third, there is no center but many nodes. The social network "[extends and augments] […] the body and mind of the human subject" (2006, 9). A social network enhances human's cognitive, motor and sensory skills. The enhancement provides an interconnection between human and the Internet, which function as a prosthetic to their natural abilities and capabilities. Hence, the prosthetic use of the Internet constructs what I define as social/wired cyborgs.

2.2 Em/dis/re-embodiment – (social) distributed cognition

A Digital network extends and embodies people's cognition socially. Some artifacts such as a hearing aid, a cane, and a telescope "[engage] in symbiotic relationship with the human body" (Brey 2000, 1). This relationship is what the philosopher Don Ihde refers to as "embodiment relations". Philip Brey points out that Ihdes theory "is to account for the various ways in which technology plays a role in human experience" (Brey 2000,1). Different types of this relationship exists, the "artifacts" above are perceived through the environment of the person who uses the artifact; however tools such as hammers are also considered embodied relations because the hammer gets "perceptual feedback about the world" (Brey 2000,3). Ihde was inspired by the phenomenologist Maurice Merleau-Ponty's original theory of embodiment relationship. However, Merleau-Ponty's view is broader than that of Ihde. Merleau-Ponty's theory, on the other hand does not just involve technology "but rather […] the nature of the human body and of perception" (Brey 2000, 5). Thus the world is experienced through bodies which act as a medium. To a certain degree I believe that the Internet can be seen as an embodied "artifact" as well. In addition to the embodied artifact which Brey and Ihde refers to, I would also highlight modern cybernetic technologies such as PC/Mac, smartphones, and iPads that can be perceived as embodied "artifacts" because these devices have the capability

of enhancing our cognitive/perceptual and motor skills, such as communications through social networks.

"The body schema can be changed, by the acquisition of new possibilities for movement" (2006, 7). Brey explains that Merleau-Ponty describes our body schema in two main ways, either through habit or skill. When we have learned how to perceive certain "tools", such as how to use scissors or a microscope "[these objects] become incorporated into one's body schemas" and are "direct extensions of ourselves" (2006, 8). However, not all "artifacts" become incorporated, such as "the light one switches on" (2006, 8). Likewise, Merleau-Ponty suggests that the typewriter incorporates the "skilled typist", but not the "un-skilled" typist. Thus, to an un-skilled typist, the typer fails to incorporate his or her body schema. Objects are part of our motor skills. Humans thus adapt to different objects in order to enhance and extend our own capabilities. Hence, the objects become incorporated as part of the body schema of a person. A body schema is a person's motor skills and changes as a result of relations between human and objects. Human body image, on the other hand, reflects on how a person perceives his or her bodily perception towards his/her own body; just like looking into a mirror. It can also be argued that the Internet is incorporated into our body schema when used to extend social and cognitive skills. Human perception and cognition are connected. According to Yingxu Wang (2007) at the University of Calgary perception can be defined in this way: "Perception is a set of internal sensational cognitive processes of the brain at the subconscious cognitive function layer that detects, relates, interprets, and searches internal cognitive information in the mind" (Wang 2007, 1-2). Hence, a person's perception constitutes his/her personality. By extension the cognition can also be distributed socially when interacting with other people or in the case of human/machine interaction where you interact through a machine with other individuals. In the network society, for instance, people are connected through a cybernetic system and represent themselves by distributing their cognition socially between the individuals in the network. Humans interact with and through the Internet, thus the interaction does not occur only between an object and a human, but interaction through an object with other humans. In this case the objects are a cybernetic machine (e.g. computer, smartphone) and the Internet. Moreover, *distributed cognition* is a term used when a person's individual cognition becomes social (Hutchnins 2000). Brey (2006) argues that objects mediate perceptual skills and motor skills. Perceptual skills can be mediated in three ways: "sight, hearing, and feeling" (2006, 9). Motor skills, which Brey refers to as *navigational skills*; "serve to enlarge one's body, and this enlargement has to be taken into account as one

navigates through one's environment" (2006, 9). In the first case perceptual objects can for instance be a telescope or spectacles; furthermore the Internet can also be a perceptive object or a perceptive prosthetic. An example of the Internet as perceptive prosthetics is how it can extend cognitive skills through social networks, for instance how two friends interacts and share mutual feelings. In the latter case examples of objects which are possible to carry around in the environment (e.g. a plank or a bicycle) that needs to be considered as part of a person's body space. Typically, the object is incorporated into a person's body schema. The body space is the space around you. In cyberspace, however, an example of motor/navigational skills could thus be what to be aware of when communicating on the Internet: where do you communicate with other individuals and where is your (body)space, for instance. Since cyberspace is rapidly expanding because of portable cybernetic devices another example could be a person who is using his/her smartphone while moving around in the environment; the smartphone is incorporated into his/her body schema and in order to not walk into someone s/he needs to be aware of the (body) space around him/her.

In other words the Internet can mediate perceptive/cognitive skills, which would not be possible otherwise; such as long-distance communication (although this is also possible on the telephone). The Internet can extend the sensory skills to disabled and able-bodied people. It could in some cases be argued that the mediated action of the Internet can re-embody the ableism of the body. The scholar Helena de Preester argues that in metaphorical senses a re-embodiment can occur through technological use. The notions of embodiment or re-embodiment are important when discussing Internet use, because these perspectives are often ruled out in favor of the idea of disembodiment which is so present in popular culture. Instead of focusing on how technologies fix or repair a "broken" body, the focus may be directed to how technologies, with an emphasis on the Internet, function as an embodiment or even a re-embodiment of cognitive, perceptive and sensory skills. In this way the Internet enhance, (re)-construct and connects natural skills and senses for every user.

2.3 Chapter summary

To sum up, the cyberculture started out as a counterculture to break away from mainstream cold war politics. The people in the counterculture wanted an alternative to the cold war politics and became interested in cybernetics. Eventually, the counterculture shifted into a cyberculture. Today, the cyberculture is part of our mainstream culture instead. The network society is part of this cyberculture, which connects individuals together. Furthermore, we are part of a cyborg era and the concept of a cyborg is to show how humans interconnect with

technology in contemporary societies. Moreover, we adapt to objects which become incorporated into our body schema. A cyborg is a hybrid that is part human and part machine and is a shortened term of a cybernetic organism. Humans have always been interconnected with objects; similarly we are connected through the Internet. Hence, we are wired/social cyborgs and the Internet enhances and extends our cognitive and social skills, thus allowing us to enhance our memory and communication digitally. Modern technologies are often connected to disembodiment; however some technological perspectives could question this notion. Essentially humans' relation to objects constructs an embodied notion based on the purpose of the object. These objects function as prosthetics in a prosthetic culture. The Internet takes part in the prosthetic subculture called cyberculture, whereas the Internet functions as prosthetics to human's brains, cognitive, perceptive and sensory abilities which further enhances social and cognitive skills. The cyborg concept of a human and machine hybrid is in this context the human Internet users.

3.0 Research methodology

As mentioned in the introduction I have conducted research of the prosthetic culture of Internet use. We are living in a prosthetic culture where humans are intertwined with objects that function as prosthetics to us. The objects become an extension of our limb or mind. The Internet functions as prosthetics to our brain and enhances our social cognition. I have conducted 7 interviews of individuals born in the digital era in order to study how their daily Internet use is like. Moreover, I have endeavored to enrich my encounter with informants and subsequent empirical analysis with theoretical perspectives from several disciplines, such as social science, sociology, and physiology.

To concretize such a process of interpretative iteration and engage in what has been called an inductive "analytical spiral", I have chosen a grounded theory approach. This approach is conducted through a qualitative research. Pedro F. Bendassolli concludes that "qualitative researchers tend to prioritize logic emerging from experience, preferring to expand their knowledge from it as opposed to using a priori, deductive, concepts " (2003 Bendassolli). By extension the Professor in the department of Media, Cognition and Communication at University of Copenhagen Klaus Bruhn Jensen has edited a book on qualitative and quantitative methodologies where he points out that there are three common features to qualitative research. The first of these features is to "focus on meaning, both as an object of study and as an explanatory concept" (Bruhn Jensen 2012, 266) whereas the meaning is interpreted through communication technologies. Essentially, humans "interpret" their own meanings and researchers interpret individuals and groups interpretations of themselves. Secondly, "qualitative research normally assumes that communication examined, as far as possible, in its *naturalistic* contexts" (Bruhn Jensen 2012, 266). This notion is based on "anthropological fieldwork" as well as "sampling – of cultures, communities, locales, informants, periods, and practices" (Bruhn Jensen 2012, 266). Researchers conduct inquiry on specific topics and groups in society to be examined as a "communicative phenomena", which cannot always be recognized before the process. Last feature is "the conception of researchers as *interpretive subjects*" (Bruhn Jensen 2012, 266), where the researcher shows a process of pervasive interpretation while conducting the research. These three features show how "analytical procedures" bring out "theory development". Moreover, qualitative research, particularly in relation to communication, is typically an "interative process" where the researcher gains knowledge while conducting the research (Bruhn Jensen 2012, 267). My qualitative inquiry was an interative process whereupon my theoretical framework was

conducted through several stages within the qualitative research. As further pointed out by Mills et al "Grounded theory is a methodology that seeks to construct theory about issues of peoples' lives" (Mills et al 2006, 2). The researcher typically analyzes data and evolves over time. Essentially this means that the theory is discovered inductively through the analysis. The mean to initiate and concretize is to code and categorize the data and compare it with data already existing. The method has also evolved since it was first discovered. The updated version, to which I subscribe, is a constructivist approach, which means that the theory and interview material the researcher acquires through the research is constructed rather than discovered. Constructivism does not have an objective approach, but rather rely on how society has contributed to construct the individual mind (Mills et al 2002, 3). On the Internet individual cognition is distributed socially. Distributed or social cognition is a "cognitive process" where individual cognition is distributed in and across social groups of individuals (2000, 1). As pointed out by Stephen M. Kosslyn (2006) individuals function as prosthetics to each other and connect with each other's brains. Moreover, we rely on other people in order to extend cognitive abilities. New/digital technologies, such as the Internet, have changed how people interact with each other, such as through social networking. Constructivism also has a social approach. In this spirit, the scholar Tom Andrews argues that "[c]onstructivism proposes that each individual mentally constructs the world of experience through cognitive processes while social constructionism has a social rather than an individual focus" (Andrews 2012, 1). Social constructivists thus argue from a well-articulated and defendable epistemological perspective. The phenomenon summarized by the term "cyberculture", for instance, was constructed during the cold war and was articulated a counterculture to the war society. Hence, this new form of counterculture expressed disagreement about how the society was perceived in the cold war era. As quoted above "Brand came to appreciate cybernetics as an intellectual framework and as a social practice: he associated both with alternative forms of communal organizations" (Turner 2006, 43). This social practice was constructed through the knowledge of cybernetics, which started to evolve into the society. The cyberculture started as a counterculture who wanted an intellectual alternative to the cold war era and eventually cybernetics became part of our society. In other words social constructivists claim that our individuality is constructed by the environment we are living in (Andrews 2002, Turner 2006). However, one should be aware of the possibility that some social constructivist approaches may rely too much on how the environment shapes individuals and groups of individuals, and as a consequence, may tend to disregard the fact that individuals may still think, feel and act with considerable degrees of freedom with our

own minds in relation to their environment. In these cases the researchers act upon and may rely too much on objective notions and stereotypes constructed by society as a whole.

Natilene Bowker and Keith Tuffin have conducted a social constructivist inquiry of disabled individual's daily online use. Based on the social constructivist inquiry in their research, Bowker and Tuffin conclude that we understand the world through "linguistic practices" which contextualize how the world is perceived. Thus online social interaction may suggest "challenging and reconstructing traditional beliefs about disability" (2010, 332) through written communication. As a result of an e-mail inquiry conducted, individuals with disabilities participated in a study about how they perceive their subjective identities "moved from impairment" (2010, 340). Elaborately, the study revealed that discussion involving individuals' impairments are associated to specific contexts. However, disabilities were disclosed when "personal details" were discussed and were "one of a number of personal details" disclosed individually (2010, 340). Moreover, it was also revealed that through online communications they were able to "engage in a non-disabled identity, without having to dispute the physical existence of their impairment" (2010, 340). So, in other words they were able to escape the compartmentalization of disability versus ability constructed by environmental societies. In my opinion a constructivist grounded approach may yield new ways to re-define the discourses of discussions involving able-bodied and disable-bodied in compartmentalized discourses. I discovered through inducting my qualitative research that to compartmentalize disabled individuals daily use of the Internet as one group in contrast to able-bodied individuals are not necessary in order to conduct research of daily Internet use as a prosthetic function. De-compartmentalization of disabilities individuals' use of technologies may be the way to conduct research of other types of technologies as well. The focus should be on the individual not the fact that he/she has a form of physical disability. In this way new information about technology use may occur, which benefit the society as a whole.

3.1 My role as a researcher

I conducted a social constructivist methodology where I had one idea of a topic I wanted to write about, however, while conducting data the topic was shaped on the way. The methodology is based on conducting structured objectivizing interviews. My starting point was to view the Internet as a prosthetic or extension to our brain, thus I needed to gain knowledge about the prosthetic culture. In addition, since the term prosthetics can be used

both in a material and metaphorical sense I had to find research and criticism to use of metaphors. Moreover, I also wanted to connect my research to Haraway's Cyborg manifesto and cyborg concepts, to show how humans and machines (objects in general) are interconnected. My interative research process was obtained through several stages, as pointed out above, by following the three common features. At first I focused on the meaning of Internet use in connection to physical disabilities whereas I interpreted the three informants in my research with reduced mobility's whereupon my interpretation of their meanings constructed my process which lead me in a different direction than first anticipated. My initial idea was to only conduct interviews of individuals with reduced mobility; however I made a decision to conduct interviews of able-bodied individuals as well. Essentially, my opinion regarding stereotypical compartmentalization of how disabled individuals use technologies as assistive technologies as opposed to how able-bodied use technologies for other purposes triggered my research process into including able-bodied in my interview research. To be fair even I may have assumed that differences between disabled bodied and able-bodied digital communication and information devices use would be more visible.

When establishing how I was supposed to conduct my research, I made a project description with a literature review, which I upgraded regularly while gaining more theoretical knowledge. So, as pointed out since I wanted to interview people about their daily Internet use I needed some informants. Since my direction as a researcher pointed towards interviewing both disabled bodied and able bodied people I had to apply for a license from NSD (Norwegian Social Science Data Services), pursuant to Norwegian regulations on privacy and protection of personal data in research, because I was going to collect and process some sensitive information. These aspects are addressed in greater detail and depth in chapter 3.3 below where I discuss the policy and ethics of my qualitative research in debt. My next step, after obtaining the permission to carry out these interviews was to contact several unions and associations involving people with reduced mobility. Using regular e-mail I presented my research and a template form to potential participants introducing my research project, and covering various issues, among others guarantee of explaining how potential informants will be anonymous in the research. Eventually, 3 people contacted me individually and we scheduled to meet for an interview. In addition to these 3 participants I also needed to conduct some interviews from able-bodied people. I contacted each of them in person, 4 individuals. This diversified approach, typical for a grounded method approach was necessary in order to construct a research process based on available information that I may be able to retrieve and

analyze under the circumstances of available information (2001 Bryman, 324), such as personal contacts and contacts through associations. This factor of available information is also how my research came to be regarding the analytical procedures.

Further different approaches to qualitative interviews can be obtained when conducting interviews, in addition to the three features discussed above. Bryman refers to two main ways of conducting interviews, unstructured interview and semi-structured interview (2001, 314); I obtained the latter method. Typical for semi-structured methods is to design an interview guide containing a list of questions to ask each interviewee. In addition follow-up questions which are individual to each interviewee can be added during an interview, because the interviews are unique and different answer may occur which will lead the interview in multiple directions. My interview guide is as follow (I also added a few additional follow-up questions):

1. How is your daily use of the internet? (Possible follow-up questions: When are you using the internet? Which devices do you use; PC, Smart phone etc. When are you not online?)

2. How can the internet help your daily life?

3. Can you describe situations where you use the Internet as means of aid?

4. What about the internet could you live without? Follow-up question: What would happen if you did not have Internet (access), how would that affect your life?

5. What are the greatest benefits with your Internet use?

6. What are the greatest disadvantages with your Internet use?

7. Can Internet function as a haven for you? Why? Why not? Follow-up questions: How do you separate your online activities with your offline experiences?

8. Do movement (motion)/ mobility have anything to say for how you use the Internet?

9. Do you behave in a different way when you are not online? If not, why? Follow-up: give examples.

10. Do you have anything you want to add about your Internet use which you have not mentioned? Would you like to make a comment about the interview?

- End of interview

- Show my gratitude to the participant

I constructed the questions in order to gain knowledge about a typical day of the informant's lives. I started with asking them how their daily use of the Internet is to establish aspects about their use in general. Question 2 was asked because I wanted to establish whether the Internet can assist them in certain ways. Question 3 builds on question 2, with the intention that the informant would need some time to think about the question (question 2) before forming an answer. Question 4 was asked in order to gain an understanding of their most important factors for using the Internet and also to learn possible factor for when they are not using the Internet. Question 5 and 6 were asked in order to receive information about positive and negative features with their Internet use; furthermore question 5 elaborated their answers to question 2 and 3. Question 7 was asked to establish their relations to Internet use and cognitive and social skills. The last question was asked in case the informants had anything to add, which I either did not ask them about or that they suddenly remembered. I wanted to construct a transition between each question to build a structured conversation between the informants and me. Additionally, these questions were used primarily as cognitive tools to trigger a discourse and the production of a narrative to endeavor a deeper notion of how Internet use extends and enhances aspects of our identity. The questions are constructed in a manner that generally may suit individuals who uses the Internet on a daily basis. For this purpose the questions are broad and it is to a certain extend up to the informant herself/himself whether they are willing to share personal details about themselves. My research resembles the theory of social practices as inquiry, which is a similar idea to the social constructivist concepts of society. Social practices as inquiry (Giddens 1986, 16-17) aim to show how social practice may influence individuals in relation to societal factors, as subjective and objective approach to view the environment in. Related to Internet use social practices may illustrate how the Internet functions as a prosthetic in various contexts. While conducting the interviews there are several factors to be aware of which affects the interview approach as a whole, as follows.

There are different types of criteria depending on which style the researcher approach. Bryman (2001, 318) show a list of these criteria, whereas some of them are quoted by Kvale. The criteria I used were structuring, gentle, sensitive, remembering and interpreting. The last question is an example of structuring where I finished the interview with asking if the

interviewee had additional comments etc. I also was sure to be gentle to let the interviewee make pauses to think about the question and I was also sure not to interrupt them. I endeavored to be empathetic, and listening carefully to what the informant said and how they explained things. I paid attention to the informant's non-verbal communication, such as gesture, smile, intonation, and environmental conditions. For instance, I noticed how some of the informant laughed when discussing the amount of time they spend online; which could indicate that they are aware of this mild addiction to the Internet. Furthermore, even if I interviewed them about their Internet use it was also valuable that they pointed out when they did not use the Internet. In addition I related my follow-up questions to previous things mentioned. Although I interpreted the meaning of what they told me, I did not impose an interpretation, while interacting with the informants. Hence, my interview process endeavored to reflect a fundamental sympathy to the informants. However, in spirit of my analytical process I endeavored to interpret the data material in relation to a theoretical framework concerning a literary approach which was not discussed the informants. If the research questions were constructed in a literary manner where terms such as prosthetics, extensions, and cyberspace were brought up while conducting the interviews this could affect the interviews as if I were actually imposing my own meanings as a researcher to adjust the answers given from the informants.

When starting each interview I informed the interviewee that I would record the process, asking his or her consent, which I obtained in all cases. After finishing the interviews I transcribed each interview on a computer, this establishing a corpus of transcription. While interviewing Bryman emphasizes the importance of how "an interviewer must be very attuned to and responsive to what the interviewee is saying and doing" (2001, 319). Hence I adapted all of the transcripts into forms with interpretations and notes attached, including self-reflexive notes to gain a better understanding of my position, role, and evaluation as researcher. After having collected, transcribed, annotated and interpreted each interview separately, I engaged in connecting all interviews together by drawing a "map" which would serve the purpose of discovering commonalities and differences between individuals and as part of this effort evolve a set of more analytical categories. Such categories will to be shown and discussed as part of the conceptual framework of the analysis in chapter 4.

3.2 The interviewees role

Although it is important to state my position in the research the interviewees are the main characters of my research, thus it is important to discuss their role as well. They presented me first-hand information that could not be acquired otherwise.

The common denominator for all interviewees is that they are all born digital in the digital era. According to the researchers John Palfrey and Urs Gasser individuals who are born digital "were all born after 1980, when social digital technologies, such as Usenet and bulletin board systems, came online" (2008, 1). All interviewees were born after 1980, and they have Internet access at home and use several different ICT- devices to access the Internet. If I were to conduct interviews from a wider age gap I would have to take into consideration that some of them did not grow up with an Internet access. There may be differences to how a person in his/her 20s perceives the Internet as opposed to an adolescent or a child, because of the rapid change of the Internet since the 1990s (2010, Lenhart et al). In these cases I would look at similarities and differences between the different age groups in addition to how their daily Internet use is situated. In this manner all interviewees have the same starting point, since they were all digital natives in their 20s. However, I have chosen to focus on the age group 18-30 because I wanted to conduct a research on individuals with the same prerequisites, regarding they all grew up with Internet access.

Another aspect of the choice of the interviewees is the aspect of geography or location. I wanted all the interviewees to live in the area of Bergen, so I could be able to meet them face-to-face for the interviews. The interview process being time consuming (e.g. transcribing, analyzing), if the interviewees they lived far away from Bergen the logistic aspects could become a concern to me. Moreover the economic costs of travelling could also become a concern to me.

I interviewed seven participants whereas three are disabled-bodied and four are able-bodied. Two of them have jobs, while one is unable to work due to his disability, and four are students (some of them with part time jobs). I have given all of them fictive names in order to hide their identity. A presentation and relevant information (in accordance to the analysis below) of each participant will follow in the order they were interviewed:

Tommy: Has a slight reduced mobility. Tommy has a job and does only use the Internet after work when he is at home. Usually he uses the Internet on his Mac; and sometimes on his iPad

when he is travelling. Furthermore, he has a smartphone, but rarely uses the Internet on this device. He also uses the Internet to become enlightened through news reading.

Kai: Has reduced mobility- and sight. Sometimes he uses the Internet, so he does not have to worry about his reduced mobility in environmental spaces. He also uses the Internet to enhance his social and cognitive skills.

Eva: Has reduced mobility and use a wheel chair. She uses the Internet after work when she is at home. Furthermore she uses the Internet for organizational purposes. In addition she uses the Internet to enhance her social skills.

Sara: Is able-bodied. She is a student and uses the Internet for her school work, and for leisure time. In addition she uses the Internet to socially distribute her cognition, and to enhance her memory artificially.

Lisa: Is able-bodied. She is a student and uses the Internet for her school work. Furthermore she uses the Internet for organizational purposes. In addition she uses the Internet to enhance her cognitive skills and to enhance her memory artificially.

Kaja: Is able-bodied. She is a student and uses the Internet for her school. Furthermore she is also a hobby photographer and uses the Internet to distribute her photos.

Ivar: Is able-bodied. He is a student and uses the Internet for his school work, and for leisure time, and to find information online.

The reasons why I included both disabled -and able bodied are because it is important to also include disabled people in the research, so it will not appear to be a research for only able-bodied people. A physically or cognitive disabled person is not part of one common group. Disabilities differ from each other and need to be discussed separately, so when interviewing both able-bodied and disabled bodied people; to include a variety of disabilities would separate them, although prosthetics (e.g. wheel chair, glasses, artificial hip, neural implant, in this context I also include the Internet) are supposed to have a normalized function.

I want to point out that able-bodied people can also have disabilities in certain contexts though. Several of the able-bodied people use spectacles, for instance, in order to increase their sight. In addition I also wanted to interview people who use ICT-devices without individual adaptations or customizations because of a physical, mental or sensory disability. Thus, I wanted to interview persons with (and without) reduced mobility. One of the

interviewees also have reduced sight, however he is able to use ICT-devices that are not individually customized for his benefit.

Furthermore, the informants have shown an insight of how they use the Internet and have thus narrated a non-stereotypical approach to how the Internet function as prosthetics to human brains which further embodied their cognitive, perceptive, and motor skills regardless of abilities/disabilities. The sociologist Peter Freund argues in his essay that society should not view individuals in social standards regarding the physicality of the body. This aspect does not only include disabilities and impairments, but also other "deviant" bodies, such as height, or size which typically may be "disabling" viewed in "particular contexts" outside of the standards of society (Freund 2001, 692). Furthermore, the scholar Ingunn Moser suggests that we should "reproduce boundaries between abled and disabled, normal and deviant, which constitute some people disabled in the first place" (Moser 2006, 374-375). In addition Moser claims that the normalization technologies tend to offer will increase the reproduction of normalcy versus other groups. Thus, technologies should not be reference to issues involving normalcy. I suggest that the Internet should be discussed in relation to particular purposes of individual use, which may or may not represent other individuals in society as well. The informants are the characters of the research in order to illustrate main features of Internet use in a prosthetic society. Thus, some personal details of the informants revealed during the interviews are related to their individual Internet use, which represent a part of our society where individuals use the Internet daily.

3.3 Policy and ethics

Since my research includes sensitive information about people with reduced mobility I had to apply NSD (Norwegian Social Science Data Services) to be able to conduct the interviews. My application was accepted and I was recommended to use NSD's template form when conducting an information form to my interviewees. The form will be attached in an appendix.

Furthermore, my interviewees need to be guaranteed absolute anonymity, and I have kept sensitive information in a separate file that only I have access to. The file will be deleted after my thesis is delivered. Thus, I have chosen to use fictive names for all participants. In addition I will not give any specific details about where they are situated. However, I have chosen to keep the gender and (approximate) age visible.

3.4 Chapter summary

My research is a qualitative research with a grounded theory and a social constructivist approach. Thus I have endeavored to collect and interpret data over a period of time that shaped and constructed my research up until the initial phase of the research process. I conducted a qualitative research of seven individuals living in the area of Bergen. The aim of the interviews was to conduct a study about their daily Internet use, which could be applied to a broader part of our society in Norway. My qualitative research may constitute an alternative approach to how technologies can be researched without the normalcy aspect in the way of the study, which is often not the case in social science studies.

4.0 Grounded Theory analysis: a qualitative research of Internet use

I have conducted a grounded theory of Internet use among seven individuals. As a result of this research I have analyzed and discussed the data, which has been structured into three sections: 4.1 Cyberspace as material space – cyberbodies, 4.2 Enhanced information – cognitive skills, and 4.3 Enhanced communication – social skills. The interview material is discussed and presented as best fitted in these three sections. In the first section I present information concerning how the interviewees perceive themselves in cyberspace, and how space and time intertwine. In the second section I present how the interviewees perceive information they find online and how this information may construct their cognitive skills and perception. In the third section I analyze how their social skills are affected in cyberspace. By extension the last section will sum up the analysis.

4.1 Cyberspace as material space – cyberbodies (and motor skills)

Cyberspace and the Internet are often perceived as an immaterial space, a space that is not part of the real world; however it is just as real as the rest of the world. The cyborgian notion of the Internet is that it disembodies human's mind and body. This notion has typically arose from cyborg non-fiction where digital technology, especially the computer, is presented as means to separate the body and mind or to merge human intelligence with artificial intelligence. This type of fiction is usually referred to as cyberpunk fiction. *Neuromancer* by William Gibson (1984), for instance, presented *cyberspace* as a virtual reality (VR) dataspace, which is called the "Matrix". Inside the "Matrix" people's consciousness exist leaving the body behind in real space. The editors of *Cybespace, Cybebodies, Cybepunk: Cultures of Technological Embodiment* Mike Featherstone and Roger Burrows (1995) use the term *cyberbodies* to refer to bodies in cyberspace. Cyberbodies have often been connected to disembodiment, especially because of cyberpunk literature. Deborah Lupton (1995) describes cyberbodies in this way:

> The idealized virtual body does not eat, drink, urinate or defecate; it does not get tired, it does not become ill; it does not die (although it does appear to engage in sexual activity, as all the hype around teledildonics and virtual reality suggests). The vision may be considered to be the apotheosis of the post-Enlightenment represented as earthly, irrational, weak, and passive, while the mind portrayed as spiritual, rational, abstract and active, seeking constantly to stave off the demands of embodiment (1995, 101).

Furthermore, Lupton points out that the cyborg, "is the closest to this ideal", because it represent a hybrid body, which is partially flesh and partially machine (1995, 101). However, humans have not reached this state of being, at least not yet. The Internet, does not separate our identity and flesh, but rather extends and enhances our cognitive and social skills. This suggests an embodiment or even a re-embodiment (Brey 2000, de Preester 2010) through our body schema. Objects are obtained through our body schema; the way we perceive the environment. Maurice Merleau-Ponty's definition of tools as extensions, such as the scissor that incorporates and extends the hand, can also define digital information- and communication devices as well. The information- and communication is perceived in the environment of cyberspace, however, it is also perceived beyond cyberspace creating a human-machine-human interaction.

The interviewees in my research were asked several questions that involved their Internet use and how they perceive their Internet use. When asked how their daily use of the Internet is; I received many of the same types of answers. They interpreted this question through a collective subject perspective, which indicates that the net(work) society plays a role in how each of them perceive their Internet use. The society as a whole has constructed their individual notion of how and why they use the Internet. Some of the answers I received were:

Tommy: "My daily use consists of newspapers and news and football and Facebook. That's it; and usually when I come home from work".

Eva: "Hmm, I use it regularly. Facebook and mail and…hmm news, and yes, such things… And I also have a board commission duty, that I use it [the Internet] for that purpose… Communication with the members and the like… Via our Facebook-page and these things, so… But, much time is spent".

Sara: "It's like… the day starts out…well…like… the first thing I do when I get up [in the morning] is to connect to the Internet on my cellphone, on social media or to check online papers. That is also the last thing I do before I go to bed. So, strictly speaking I kind of… I kind of use the Internet all the time".

Ivar: "My daily Internet use depends on what I am looking for. If there is a day where I have to work a lot with schoolwork, much use of Google is in use; but other than that I use the Internet much like ordinary people [lay people]: on YouTube, find music, watch video. Other than that I just; in general use the net to find some information that is intr… that interest me,

or catch news, whatever happens around in the world; and other than that I use… I chat, keep in touch with people I know from other places [than Bergen] … this is pretty much how I use it [the Internet]".

The other interviewees had similar answers as well. To sum up they all use the Internet to find information and news, thus to stay enlightened; to stay in touch with people they know; and also to engage in interests and activities they are involved in. Thus, they use the Internet to extend activities in environmental and offline space. Typically, both offline and online space interconnect. They all use the Internet to contact people they already know. One notion they all seem to share is how the Internet enhances their social skills. To some of the interviewees, their net use creates a paradox between enhancing their social interaction as opposed to decreasing their social skills instead. This paradox is pointed out by Ivar when asked if he is less social when he is online than offline:

Ivar: "It depends on how often the people I talk to on the net are people that I know on beforehand, but which I do not have the opportunity to talk to [offline] since I am… Because of distances. It ain't that easy to stay in contact with someone who live on the other side of the country unless you do it [stay in touch] through the Internet; while I am probably less locally social because of the Internet, which means that I am not meeting people in the local community".

Essentially, the Internet enhances his long distance connection with family and friends, but there is also an anti-social factor to extensive use of the Internet. Information- and communication devices, with an emphasis on the smartphone can also create a paradox between social and anti-social behavior. When asked what about the Internet Sara could live without; she replied:

Sara: "Eh, I think I would feel very isolated, eh that I, like, I would miss out on things that happened, but it would mean that I would be more present in the real world"

Interviewer: "Would you perhaps become social in a different way?

Sara: "Yes, I try to be conscious of, when I am hanging out with people that I am not using my phone [smartphone] … I try to do, although it isn't always easy, but… I try to be conscious of not using the phone when I am hanging out with my friends".

Sara also admits that she, sometimes, become antisocial because of her smartphone use. The Internet connects her to the rest of the world; however, Internet's portable smartphone functions can enable her to interact in offline settings. This interconnection between her and her phone indicates that the Internet incorporates her accessibility. A common assumption is to view the Internet as a virtual or imaginative space which is separated from the outside world, as Sara refers to "the real world" and the Internet as to separate spheres; when in fact she herself and other interviewees as well do not separate these spaces in reality. The distinctions between cyberspace and physical space tend to blur. Hence, this interconnection between spaces causes some side effects in social contexts. Sara's use of the social object..

These interviews suggest so far that we are living in a cyborg society where digital technology and humans interconnect. Haraway (1984, 149) points out that fiction and our social and bodily reality are coupled together. "The cyborg is a condensed image of both imagination and material reality, the two joined centers structuring any possibility of historical transformation" (1984, 150). The imagination is our subject (and) individual mind where we construct our thoughts. Our subject minds are affected by the society we are living in, the material reality. As already pointed out we are living in a cyberculture. The network society and the informationalism of the cyborg era are both part of the cyberculture. These factors affect the way we think and act in society. Hence, cyberspace affects the outside/environmental space and both are part of a material reality. Thus, the answers about the interviewees' daily Internet use clearly show how the outside space is condensed by cyberspace. Kaja, is a hobby photographer and she uploads her photos online to her blog, Facebook and other social media. Hence, Kaja extends her visual skills through the (digital) camera, which is extended further by the Internet; thus, creating a human-machine-machine interaction. Celia Lury (1998) suggests that we are living in a prosthetic culture and discuss this culture through the lenses of a camera. Re-defined by Lury the late poet Johann Wolfgang Goethe's point of view on vision, "is an irreducible amalgam of physiological processes and external stimulation" (1998, 159). Furthermore; "[i]n this reconceptualization of vision, the observer is repositioned in an undermarcated terrain where the distinction between the internal sensation and external source is irrevocably blurred and the body of the observer is constructed as a surface of inscriptions on which plays a promiscuous range of effects" (1998, 159). Lury cites Johannes Crary's epistemological view on vision and claimed that vision is a "temporal" process within the subject body and he pointed to the contemporary culture (nineteenth century) as a factor for "an increasing *embodiment* and *subjectivisation* of vision"

(1998, 159). In Kaja's case her external vision interconnects with the camera lenses, thus the camera functions as prosthetics to her vision. Moreover, cyberspace extends her vision from her internal space and body space to the external space of the Internet.

While Eva, on the other hand, has a board commission duty in an organization which occupy much of her leisure time. Hence, she spends much time online to send e-mails, rather than sending letters in the traditional way, and sending e-mails saves her a quite amount of time. When asked what the greatest benefits with here Internet use is, Eva replied:

Eva: "Hmmm, that I am updated on news and that I stay in touch with people…. Hmmm, if I had to, yes, eh… You become more efficient with the work you do, at least I am a member of an association, so the organizational work interaction with associates; aaand you get to send out things to your members much faster when you have a mail [account] … then you won't need to fold envelopes all the time".

In this way the software and Internet access that allows her to send e-mails extends her communication, and the e-mail software incorporates her sensory information as a "skilled" user of the software. Philip Brey (2000) suggests that our body schema, which is (the subject perception) of ourselves changes when interacting with new objects in the environmental space. The environmental space is outside of our body, but nevertheless affects or body schema. Merleau-Ponty (2005) describes the perception of our body schema as our "body image". He related the body image to phantom limbs, which are feelings of limbs that have been removed for medical purposes, but the feeling of the limb remains. In these cases the body image is still experienced through the structure of the natural body before the limb was removed. Furthermore, Merleau-Ponty (2005) refers to our body in a spatial and external sense whereas our body image is "dynamic" and "this term means that my body appears to me as an attitude directed towards a certain existing or possible task" (2005, 114). Moreover, this dynamic aspect constitutes a "spatiality of situation" (2005, 115), which means that the action that a body part executes is in focus. For instance when leaning on a table with both hands, the hands are in focus although the rest of the body is still positioned or present. Merleau-Ponty calls this "bodily space" and distinguishes this space from "external space". Importantly, "the body image is finally a way of stating that my body is in-the-world" (2005, 115). Hence, you connect to your situation and surroundings around you. "When I say that an object is *on* the table, I always mentally put myself either in the table or in the object, and I apply to them a category which theoretically fits the relationship of my body to external

objects" (2005, 116). How can this perception of the physical body be connected to e-mail use? In Eva's, case she uses her hands to write the e-mails and the keyboard and PC-screen extends the perception of her motor skills; her writing skills. The Internet connection, on the other hand enhances the communication between her and the members of her organization. Thus, the Internet becomes her prosthetics, or cyber-prosthetics. She is situated in both cyberspace and offline space at once and her bodily space are intertwined with her cyberbody. Similarly, Kaja's visual perception interconnects with her smartphone or Mac when her photos are published online.

Another aspect of how cyberspace condenses the offline-space is, as Sara already spoke of above in relation to the Internet and social affects, that portable devices such as smartphones and iPads allow humans to access cyberspace in offline-spheres. Bellow follows a part of the interview conducted with Ivar where he points this out:

Interviewer: Do movement (motion)/ mobility have anything to say for how you use the Internet?

Ivar: No, not really. I am… thanks to the smartphone it is quite possible to use the Internet wherever you are, provided you have Internet access, or that you have a possible access via your phone. So you can go for a walk outside and check the news at the same time… But, of course if you are jogging or something like that, than it becomes much harder though… My mobility does not have a … My mobility is in some degree influence by… when I have a net connection, but not in the same degree as without a smartphone".

Interviewer: Right. How so?

Ivar: Well, when you are outdoors, you are of course… When you are running, you are moving that much so, if you are standing… the ground will be quite uneven and… this will cause your arm to move that fast that it will be difficult to focus on, to focus on what's actually on the [smartphone] screen. You actually have to watch the road to know what you are doing, but also if you are too focused on the screen it is easy to just run straight at somebody… hit other people… Instead, you are [literally] running into them".

Moreover, when asked if it is harder to maintain a distinction between *offline* and *online*, because the Internet is portable, he replied:

"Yes, it is more difficult in a greater degree than before; to me it is not so hard because I rem… Pretty much, unless there is a news case that is of greater interests to me, that's no problem".

Cyberspace and offline-space do not completely merge into each other, creating a partially cybernetic and partially natural world, however as stated cyberspace condenses offline-space and both are part of a material-reality with different contexts. Ivar then extends his offline-space with cyberspace and becomes, as I would call it, *partially wired*. The net connection on a smartphone makes it easier to connect online while occupied with other things at the same time, thus switching between being wired and offline. Sara also points out that even when she is connected to the Internet on her PC, she is occupied with multiple things at once. Moreover, she also points out that because of her smartphone she can also follow a conversation about a video someone saw online, for instance, in offline-space; just by accessing the Internet on her phone. She also says

Sara: "Yes, this is how it spreads… That like, we watch things on the Internet and then it becomes a topic to discuss outside of the Internet too… and suddenly it's like, oh now you have to go watch it because you like it yourself and then maybe you share it, and then it kind of becomes a talking point".

In this sense cyberspace connects with the offline-space creating social interactivity. Hence, the offline environment and the digital environment are bridged together. Sara and her friends or acquaintances are *partially wired*. They interconnect with the Internet and are what theorists and scholars like Haraway and others would call cyborgs. Cyborgs are human-machine hybrids; in this context the interconnection happens on a phenomenological level through extensions of their social interaction, creating what I will refer to as *social/wired cyborgs*. Social/wired cyborgs are humans who use digital devices to connect to the Internet in order to interact with other humans and to find external information which function as prosthetic knowledge. The prosthetic knowledge in this context is the collective information available online, such as Google and Wikipedia, which exists because of human collaboration. Social/wired cyborgs thus interact through or with machines (non-humans). This definition differs slightly from the original definition presented from Clynes and Kline, and the re-definition presented by Haraway. However, Cyborgs evolve along with how the society changes. Clynes' and Kline's concepts of a human cyborg is as already pointed out that humans should be able to survive in extraterrestrial environments through a technological

device incorporated into humans homeostatic systems. It was also emphasized that this machine would have an automatic function and would conduct tasks humans would not be able to do while flying a spaceship; however the machine should not have a conscious of its own, because that could oppose a threat to humans. Ironically, cyberpunk literature often describes robots which possess their own subconscious, which seems to be the opposite of Clynes' and Kline's concepts. Moreover, my interpretation of Haraway's modern/contemporary cyborgs is how the cyborg concept can change the notion of a patriarchal society, from the point of views of the twentieth century, to a liberal society where women can speak their minds. So, Haraway uses the notion of a cyborg to show how cyborgs construct politics, whereas she is pointing out that "[t]he cyborg is or ontology; it gives us our politics" (1991, 150). The social/wired cyborg, on the other hand, augments and mediates his/her cognitive and social senses through the computer and the Internet. These cyborgs show that human's individual cognition is social or distributed and reach beyond the human mind. If my research were a purely ontological study based on pure objectivism, I would not need the interviewees because their subjective minds would not matter, and I could base my research on assumptions. However, my research needs subjective as well as objective views to function. Moreover, ontological perspectives function in other types of studies.

The social neuroscience scholar Cade McCall has this assumption of the contemporary cyborg:

> As cyborgs we use technology to extend our abilities beyond what the natural world has provided. But unlike the cyborgs of science fiction that possess superhuman physical abilities, we use our powers to tweet or consult Wikipedia. At this point, the cyborgs of the Internet seems to have left the body behind" (2013, 314).

This is a common assumption to make in accordance to cyborgs in cyberspace. However McCall does not imply a full disembodiment of mind and body with this assumption; rather he seems to settle for a midway between disembodiment and embodiment. Our digital representations suggest that "we [are] extend[ed] beyond our bodies" (2013, 316). Social interaction differs in online environments as oppose to offline environments where visual representation in some degrees replaces physical action. To illustrate how online social interaction trigger social cognition; MacCall suggests that "[o]nscreen representation, most commonly cursors act as digital extensions of our bodies" (2013, 316). To a certain extend

"cursors become incorporated into our body schemas" (2013, 316). This social embodiment can have a positive effect because symbols represent positive stimuli.

Similarly, the informants in my research relate to Internet use as a relaxed space. One common denominator amongst all the interviewees is that all of them associate Internet use with their home environment, or home space. I asked all interviewees the following question: Can Internet function as a haven for you? Why? Why not? There was only one of the interviewees who did not agree to this notion, Tommy; however like the other interviewees he also uses the Internet to relax, especially when he is at home. The interviewees replied to the question in several ways. Kai's body schema changes when he is at home using the Internet:

Kai: "Well, I feel that my arm and foot, it well… and also that my sight is bad, I can only see, eh approximately 50 per cent or a side vision on the right side, and weaker [sight] on the right and left [eye], so this is why it [the net] feels like a haven; because then you don't need to think of it [the reduced mobility and sight]. I don't have to tell… I don't have to avoid walking into someone and similar things… Ehhh, and it's the same with my hand; I try not be embarrassed but sometimes I do; if I bump into different people aaaand. So, to me to be on the net is quite a sense of freedom. Then I don't think about it at all…".

Kai's phenomenological perception of his body, his body space, thus consists of external factors. At home, on the other hand, he can create a relaxed space by connecting to the Internet. Thus, his body image changes in cyberspace where his body is not in focus, however this notion does not suggest that the Internet creates a full disembodiment between his physical body and mind; perhaps his body rather is transcended into a cyberbody which then transcends his emotions towards his body. His emotional cognitive process seems to have a positive effect when he is online, similar to McCall's example of how cursor use have a positive effect to our body schema. Likewise other interviewees' use the Internet to relax, thus their cognitive process is more relaxed in cyberspace. Although, Ivar points out that his Internet use can cause the opposite effect as well. There are different studies of cognitive and perceptual emotions, which the philosopher Louis C. Charland (1997) discusses in an essay, where he proposes different cognitive and perceptual approaches to the process of emotion. Typically, *emotion* is analyzed from a philosophical and a physiological view. Charland states that "cognitive theories of emotion generally assert that some kind of evaluative judgment or appraisal is required for emotion. In the perceptual case, emotion is usually held *not* to require judgment or appraisal in any such sense" (Charland 1997, 556). Perceptual *emotions* rather

focus on "feelings" (Charland 1997, 556). Both approaches can thus be intertwined. The theorist Ronald Alan Nash (1989) highlights how an emotion can be processed from a perspective of *Pure Cognitive Theory*, which "analyzes an emotion solely in terms of beliefs, desires and other intentional states" (Nash 1989, 484). Another approach is the *The Hybrid Cognitive Theory* which adds "fundamental descriptions [that] refer to bodily disturbances: trembling, blushing, perspiring, and so on" (Nash 1989, 484). The theorist Ronald Alan Nash (1989) argues that neither of these theories are valid enough alone, methodologically speaking an emotion is not an objective process, but a subjective process. Thus, I will add *relaxation* as part of an emotional process. Other interviewees, such as Eva and Lisa, answered that they use the Internet to relax when they are at home. The environment at home can also trigger a relaxed atmosphere provided there are no stressful disturbances in the background, such as noise or chores that have to be done. Eva and Lisa stressed that they perceived the Internet as a haven in cases where they were at home and could relax while watching TV-shows for instance. Kai's *emotion* towards his physical disability thus is a cognitive and perceptual process, whereas cyberspace constructs a relaxed atmosphere towards his body schema.

Another aspect of cyberspace is that it extends our geographical space and presence, thus allows us to alter time. You can pretty much travel in cyberspace regardless of geographical boundaries and time (zones). Hence, the boundaries on cyberspace are different than in offline-space. Sang-Hee Kweong et al (2011) emphasize that "cyber media, such as the Internet and mobile communication has reshaped spatial and temporal boundaries" (2011, 25). Sang-Hee Kweong et al suggest that cyber-space is a "mental space" or a cognition space, and this space "provides a new way for people to associate from different geographical location" (2011, 26). The tradition of space has changed because of the Internet. As already stated by the interviewees, the Internet extends their communication with people who live far away from Bergen, thus blurring the geographical boundaries otherwise not possible; except by calling from a phone though. Lisa's greatest advantage using the Internet is her availability, especially internationally because she can read blogs from across the world and access them immediately. Private and public spaces collide, because Lisa's private space at home and the public space of the Internet collide allowing her to alter time and space altogether; suggesting that both cyberspace and (cyber)time intertwine. Other factors showing that cyberspace is used as a material space in line with offline-space is the material goods which are possible to buy online. Several interviewees highlighted that they often bought material goods online, because of the variety of goods online and also because it tends to be cheaper to purchase

these items online as opposed to offline. However, most of them pointed out that the reason why they bought things, such as books online was because of the availability rather than the mobility aspect. They also admitted to buy tickets for public transportation to save time. When Kaja was asked if her movement (motion) was a reason for why she uses the Internet; she replied:

Kaja: "Yeah, well, one might have become lazier [laughter] because I remember before, you went to the movie theatre to buy tickets, while now you can buy them online. And you often chose the net version, for instance, I often buy train tickets online, you know, but it is… You ain't got a choice anymore; one is almost forced to buy it [tickets] online."

Kaja confesses that some of the benefits with her Internet use might have contributed to a lazier lifestyle; however she makes a valid point when reflecting on why it is preferable to her and other people to buy tickets online. The marketing strategies have changes recently, which, in this case also altered time in the sense that Kaja; as well as other interviewees; saves time to choose the net version that Kaja refers to.

Time, actually constructed a paradox to the interviewees, because they use the Internet to save time, but equally spends too much time online. The interviewees told me that they used the Internet for multiple purposes related to time. When asked if Internet use is timesaving to Lisa, she replied:

Lisa: "Yes, very much, very much… It takes much shorter time to make a poster, for instance, advertising the student group I am leading… eh when I can publish it on… to make in on a PC and to publish it on the net; in that way I get an information spam, what is the name, informations… ehhh. I reach out to much more people than if I physically have to give it [the advertisement]… One might become lazier, but you reach out to, you reach out to, one reaches out to much more people and saves time".

In contrast, when Ivar is asked what the greatest disadvantage with his internet use is, he replied following:

Ivar: "It's probably that it becomes… can easily be sitting in front of the computer screen from quite a long time… because it's… well,, you are going to check news for some case that's of interest to… that you are following, and then, oh suddenly here is a.. oh, did that happened there, then I move on to read another news article, and what you planed would be a quick [news] update, would take less than 10 minutes, then you can be quite taken by other

cases/feeds too, and suddenly you've been sitting there an hour or two. But it's also a lot of information, so if you are searching for specific information for the school work, and you find something with general information, and you just want something specific".

On the one hand the Internet constructs more time, but on the other hand it consumes the time as well. This indicates that cyberspace, with an emphasis on how the Internet is used in relation to time, have reconstructed human's perspective on time. There are both positive and negative aspects to cybertime. Considering how time and space connects and depend on each other cyberspace has an impact of human's social lives. Even I notice how tempting it is to get lost in cyberspace with all the temptations like Facebook, celebrity gossips and the like, when I am supposed to be disciplined in order to do important school work for instance, nevertheless these side-effects do not overshadow the positive aspects of travelling in space and time, so to speak. Kweon et al discuss time in relation to different media, and point out that time on the Internet differs from time in other media. Suggested by Kweon et al "[t]he new media shapes our cognition of time and space: reality time, cyber time, real world, and cyberspace" (2011, 27-28). Although I agree that new media, in particularly the Internet shape how we perceive time in relation to space, I do not distinguish between real world and cyberspace. On the contrary I am arguing that cyberspace is a part of our "real" world, however the Internet provide a different perception of time, which will affect offline activities, such as illustrated by Lisa and Ivar. On the one hand, the Internet allows you to alter time and space, and on the other hand this alteration of time and space may interfere with how you spend your time.

To sum up, offline-space is condensed with cyberspace, which affects how humans relate to time and space. Although cyborgian notions of modern technology, especially the Internet, often point out that mind and body are separated in cyberspace; this notion is often condensed by cyberpunk notions of cyberspace. Thus, when digging deeper into the notion of cyberspace, it reveals individuals who socially distribute their cognition to interact through and with a cybernetic system while at the same time residing in offline-space. This interconnection allows them to use their cognitive skills to find information otherwise difficult to obtain. Furthermore, this prosthetic knowledge extends humans natural cognitive knowledge constructing social/wired cyborgs.

4.2 Enhanced information –cognitive skills

The information received online was another factor that the interviewees highlighted as part of their daily Internet use. Information accessed online is collaboration between humans. The author Pierre Lévy refers to this collaboration as "collective intelligence" (Lévy 1999). Collective intelligence "is a form of *universally distributed intelligence*, constantly enhanced, coordinated in real time, and resulting in the effect mobilization of skills" (Lévy 1999, 13). In other words the universally distributed intelligence represents everyone who uploads information online. One example of universally distributed intelligence is the website Wikipedia.org. The aim of Wikipedia is to publish vast information about different topics (e.g. related to hobbies, countries, terms and more), whereas the texts can be revised multiple times by everyone with an account. Hence, the texts are "constantly enhanced", as defined by Lévy. Moreover, as mentioned above offline-space and cyberspace collide; in this case real time (offline-time) is perceived online.

In this notion of collaborated knowledge and information, the Internet functions as prosthetics to the human brain and mind. The knowledge perceived from the Internet stimulates human cognition and extends human's natural intelligence with multiple intelligences, similar to *intelligence amplification* (IA); also referred to as intelligence *augmentation*. IA use technology to alter the human brain. Considering the disembodied and dystopian notion of a cyborg, especially from a fictional point of view, IA could offer further augmentation than what the Internet provides its users today. The Internet is still not physically augmenting our intelligence, although it does seem to function as an extension metaphorically speaking, because we can connect to the Internet and find information, but this information is no uploaded directly into our brains. Cognitive scientists connect the collective intelligence to *distributed cognition*. Distributed cognition, also referred to as *social cognition* connects individual cognition. The cognitive scientist Edwin Hutchins (2000) defines distributed cognition as "distribution of cognitive process" (Hutchins 2000, 1). There are three kinds of distribution:

> [C]ognitive processes may be distributed across the members of a social group, cognitive process may be distributed in the sense that the operation of the cognitive system involves coordination between the internal and external (material or environmental) structure, and processes may be distributed through time in such a way that the products of earlier events can transform the nature of later events (Hutchins 2000, 1-2)

Distributed cognition applied to digital information and communication is thus a social distributed cognition where individual cognition is distributed to other individuals. Hence, the online information is perceptive through multiple cognitions at once. Methodologically speaking the Internet society has reconstructed cognitive perception. From the view of social constructivism, this is the sum of individuals representing the society of collective intelligence. Although the interviewees and other individuals as well are not necessarily participating in the collaboration per se; they are still part of the collective intelligence. As a result of the term collective intelligence similar terms have been coined, such as Henry Jenkins' (2006) *participatory culture*. The participatory culture provides an understanding of how individuals participate in publishing things online, such as videos on YouTube, for instance.

When the interviewees were asked what the advantages to their Internet usage are, some of them pointed out that the available information the Internet provides them is a positive factor that enhances their knowledge. Lisa was asked if she uses the Internet as a means of assistance and gave me the following answer:

Lisa: "OH WIKIPEDIA, I LOVE WIKIPEDIA, when I was a child I always checked things in the encyclopedia, but in the encyclopedia, it was like.., okay an article about cats, was very short. But on Wikipedia the articles are quite long and then you can click on links and then, well, ehh, just with the information, ehh, and maybe it's not that much knowledge; much more knowledge, but well I read an article that we approach knowledge in a completely new way, because we, ehh, we don't need to cram [the information] that much anymore, because the information is available; so it's like if you need some answers on something you can just check it out, which means you don't have to memorize it."

Lisa shouted out her enthusiasm for Wikipedia and is a diligent user of the net-encyclopedia. Even if the website supplements her with additional information, she is unsure of whether she approaches additional knowledge as well. Likewise she does not need to memorize the information by heart because Wikipedia memorizes it for her. In contrast, Ivar is less enthusiastic about the information flow and sometimes experience an over exposure of information from the Internet. Studies show that extensive Internet use can have a negative impact on the users' brain. The media theorist Nick Carr discusses how "[m]ore information can mean less knowledge" (Carr 2010, 214). He highlights his claims by citing Christof Van Nimwegen's puzzle experiment. In short the experiment were conducted in two groups

whereas the aim was to solve a puzzle where one group used assistant software in order to solve the puzzle and the other group "used a bare-bones program" (Carr 2010, 214) with no assistance: "In the end, those using the unhelpful program were able to solve the puzzle more quickly and with fewer wrong moves" (Carr 2010, 215)

Similarly to Lisa, Sara admitted that she experiences the Internet as an extension to her brain. Sara uses first and foremost Google to find information, although she often ends up at Wikipedia by googling topics. Sara replied following when asked what her greatest advantage with her Internet use is:

Sara: "Ehmm, that I can easily get an answer to something, eeh, I feel quite social; ehh, well to me the Internet functions as an extra brain because; I don't need to know everything, it's so easy to just look it up… I don't need to always be with my friends because we talk on social media, we send each other photos and…".

Google and Wikipedia are interpreted as valuable and important tools for schoolwork among the interviewees. These tools help us to find valuable and useful information online. However, as pointed out by the Robertson Professor Siva Vaidhyanathan in *The Googlization of Everything* extensive use of such tools also has a downside, because we forget to remember things that we otherwise would have remembered or known without extended help (2011, 174-176). Vaidhyanathan also points out that this side effect of the Googalization age is often overshadowed by the romaticization of how efficient and time-saving Google is. However, Vaidhyanathan states "I do not need my memory any more", whereas Google has the answer for him. As an example he uses the song, somewhat ironically, "I forgot to remember to forget" by Elvis Presley, which he Googled the other day and a Wikipedia link showed up telling him when the song was created. This took him a few seconds, although he could have looked through his album-collection where he would find the same information. "I don't need my own memory anymore" (2011, 174) he reflects. Essentially, we rely on other people's knowledge because Google allows us to do so. Prosthetic memories are different than individual memories which are constructed from lived experience; these memories are constructed by other individuals and are external memories. These external memories are distributed socially, and function as prosthetic knowledge to the human brain. These memories function along the same lines as prosthetic limbs that are moveable, because these memories are accessible when needed (provided you have net connection of course). Lisa and Sara essentially rely on the Internet to "remember" things. Prosthetic memories occur through

other modern technologies as well, such as photography. The professor at University of Warwick Celia Lury (1998) suggests that the photography extends our memory and vision and is part of a prosthetic culture.

> "In adopting/adapting prosthesis, the person creates (or is created by) a self-identity that is no longer defined by the edict I think, therefore I am; rather he or she is constituted in the relation I can, therefore I am. In the mediated extension of capability that ensues, the relations between consciousness, memory and the body that had defined the possessive individual as a legal personality are experimentally dis- and re-assembled" (1998, 3).

Prosthetics redefines the natural body schema and incorporate the extension into the bodily space of motor and cognitive skills, such as vision and memory in the case of a photographer and her photos. Prosthetics, such as the Internet, reshape and reconstruct the ways of perceiving information. Kaja is interested in photography and the Internet helps her to share her photos. Her memories and visions are extended through human-machine interconnection; and the Internet incorporates her cognitive skills. To put it bluntly, the Internet enhances her capabilities to succeed as a photographer because the Internet extends her visions and memories and shares them with the outside world that she cannot achieve otherwise. She says following when asked about her advantages using the Internet:

Kaja: Well, me on the Internet is that I, I, there are many advantages for me that I for instance am doing photos and the Internet does help to spread my photos in a faster way, so that is an advantage.

She continues:

Kaja: Yeah, it is an advantage because my photos can actually achieve something, and I want to work in the media and then the Internet is a great advantage to me (hehe). If it were not for the Internet, the media would be a tuff place to work in.

In this case the Internet mediates her self-identity, as Lury refers to, or her cognition. Moreover, her cognitive process (vision, memory) is distributed socially through the Internet. Ultimately, this interconnection between Kaja and the distribution on the Internet suggest an embodiment where Kaja becomes closer to achieve her recognition as a photographer. As a matter of fact this recognition would be much harder otherwise.

Nick Carr, on the other hand, claims that new technology often have a dissociated effect on humans. This distance he believes to create a disembodiment between mind and body; thus he is especially concerned with what consequences the Internet has to our brains. "While this cybernetic blurring of mind and machine may allow us to carry out certain cognitive tasks far more efficiently, it poses a threat to our integrity as human beings" (Carr 2010, 214). To elaborate further he claims that all the information that is available online overload our brains and that humans rely too much on this information; hence this will limit human's cognitive abilities. Although his concern is a common notion of how the Internet functions the interviewees seem to be aware of the overload of information and show no indications of his deterministic views. Instead, they tend to use the Internet as an extension to their own brains in order to provide additional information to their own knowledge. Technological determinism is a term coined to describe negative phenomenological feelings towards new technology (Baym, 2010, 25). However, the phenomenon of interconnection between humans and non-humans can be traced back a long time ago (Lury 1998, Lévy 1999, and Merleau-Ponty 2005). The society changes in line with technological and political changes. If used as means to assist, the Internet and collective intelligence possess no threat to human's cognitive skills. In the long run the cybernetic blurring of mind and machine that Carr refers to in the quote might assist to grasp a better understanding of human and non-human interaction; on the other hand the *cybernetic blurring of mind* should not be confused with cyberpunk literature a la William Gibson's *Neuromancer*. Although it is true that the interviewees embrace collective intelligence some of them conceded to use print literature when possible. Kaja, actually seems to prefer print literature over Google when doing her school work. When asked if she uses the Internet in a school context she replied following:

Kaja: "Yes, I often use the Internet to search for different things… topics, but often I just use the books [textbook on her curriculum] because that is exactly what the class is about, but if I want to study it in debt, for instance if there is something I don't have a clue what is all about, then I use the Internet. "

Moreover, the Internet is used as an extension to her textbooks, as opposed to a replacement. The dystopian fear that new/modern technology will replace pre-modern technology or humans' altogether is often portrayed by technological determinists (Baym 2010, 27-28). Ultimately, the digital information is simply a means for Kaja to enhance her school work. Furthermore, as already mentioned Ivar's cognitive information processing is twofold, on the

one hand he is satisfied with the information available online, but on the other hand the information flow overwhelms him. As quoted above in chapter 4.1 Ivar said:

Ivar: "[…] But it's also a lot of information, so if you are searching for specific information for the school work, and you find something with general information, and you just want something specific".

In other words, the Internet functions as an extra brain in cases where Ivar is able to navigate through the information flow and find the specific information that he is looking for. The new ways of approaching knowledge through human-machine interaction is a cyborgian concept. Cyberspace is expanding through new means of digital communication and information, thus expanding the cyborg society as well. The information society is "becoming a cyborg society as our relationship to our tools […], has gone from tool invention through machine construction to the present stage of intimate human-machine integration" (Grey 1999). Because of this integration between human and machine I define Internet users as social/wired cyborgs, as already argued above. The cyborg society is also a social society where we still interact with other humans; however, the interaction is to a greater extent portrayed in cyberspace through ICT-devices. Chris Hables Grey concedes that the cyborg body politics has a metaphor that can be embedded into our information society to better grasp human-machine relations (Hables Grey 1999, 1). The human body image is thus reconstructed in cyberspace. Hables Grey et al points out that "one of the most fruitful metaphors is to conceptualize the human body as a rhetorical and material construction of the discourses and cultures of technoscience, the mass media, and the military; a creature that combines informatics, mechanics, and organics: a cyborg" (Hables Grey 1999, 2). In this manner the social/wired cyborg does not fully become disembodied online; the cyberbody is yet another metaphor for how to perceive bodies in cyberspace. Moreover the mind is not uploaded to cyberspace, even if mind and machine interconnect. Carr refers to this interconnection as blurring of mind and machine; nevertheless I will rather refer to mind and machine as interaction or interconnection because blurring imply that the mind and the machine have already become singular as discussed in chapter 2.

Despite the notion that the Internet and new technology in general disembodies and distance mind and body, scholars such as Helena de Preester (2010) and Don Ihde (2011) suggest new ways that the Internet can function as an embodiment. Where technological determinists see obstacles, Preester and Ihde see opportunities. They present this type of embodiment as re-

embodiment (de Preester, Ihde). de Preester (2010) argues in her essay *Technology and the Body: The (Im)Possibilities of Re-embodiment* that perceptual and sensory extension can extend the human subject through phenomenological principles and therefor has the capacity of re-embodiment. Moreover, "the experience of technology and its conditions of possibility" "requires the capacity of *re*-embodiment" (de Prester 2010, 120). de Preester distinguishes between incorporations and extensions. Objects that are incorporated into the body are defined as internal prosthetics whereas extensions are external prosthetics. On the contrary, I have applied incorporation of prosthetics in a different manner, because I have argued that the Internet is a prosthetic that extends our cognitive and perceptive skills, thus the Internet incorporates our mind and cognition. Nevertheless, this incorporation does not suggest a separation between mind and body; rather another way to perceive individuality.

The body metaphor illustrated through the cyborg society can shed light on how a possible interpretation of how different prosthetics can be related to notions of re-embodiment. The incorporation of objects and interconnection between humans and technology illustrate how humans' adaption to prosthetics may suggest a reconstruction of human capabilities. In this term the prosthetic knowledge does not construct dissociation from individual cognitive skills, rather a new way to approach knowledge. Likewise the collective intelligence which connects participation from individual minds distributes individual knowledge to social knowledge and constructs a new way to enhance natural knowledge and memory individually.

The Internet provides different types of information, and the availability of information is also connected to the aspect of time (and opportunities). The availability of information was a factor all interviewees brought up as a positive aspect of how their Internet use matters. When asked how the Internet can help Tommy's daily life he replied:

Tommy: "Eh, help my daily life…ehm… it keeps me enlightened. I rarely watch TV, heh, so it's almost a replacement for my TV-use."

Basically, he keeps himself updated on news through Norwegian online tabloids and papers. In this sense the Internet has replaced another media to him; which seemed common amongst the interviewees. Similarly, Ivar also keeps updated through online information:

Ivar: "I use the net as means of aid to find out where there are okay deals on different grocery food, and… where do I find bread and fruit and the like. It can also be a means of assistance to find deals on furniture if one is in need of that, or where… generally find out

where there are deals on goods one need without checking a paper or.. can't think of anything else."

Furthermore, he was also asked why he prefers to use the Internet to find deals on groceries and other goods, and stated that the immediate updates online is the main reason. In this case Ivar has replaced print ads in favor of digital ads. The net society in cyberspace constitute of individual participation, which thus connect minds together to provide prosthetic knowledge. Collective intelligence through cyberspace thus describes the Internet through a social perspective. Eugene F. Provenzo jr, which has written the foreword in Lévy's *Collective Intelligence* points out that collective intelligence is a knowledge space referred to as *cosmopedia*. As explained by Provenzo cosmopedia:

> [G]oes beyond the image and text characteristic of print-based encyclopedias. Instead it combines static images, video sound, interactive simulation, interactive maps, expert systems, dynamic ideographs, virtual reality, artificial life, etc. Taken to its most extreme form, the cosmopedia contains as many semiotics as exist in the world itself (1999, x).

Moreover, because of cosmopedia's interactivity it "dematerializes the artificial boundaries between disciplines" (Provenzo1999, x), thus the collaboration of knowledge makes it possible to hyperlink different "fields" together, through a collective intelligence. The Internet allows humans to enhance our own cognitive skills through obtaining prosthetic knowledge which extends our cognitive knowledge. However, individual cognition is distributed in cyberspace connecting humans together. Although, the Internet can extend our brains and stimulate it with memories obtained from various websites; the collective intelligence behind this extension also illustrate how our social skills may be affected by the Internet.

4.3 Enhanced communication – social skills

As discussed in chapter 4.1. cyberspace diminishes geographical boundaries, thus connecting individuals together. This is an important factor to all interviewees, because cyberspace allows them to hold the contact with friends and family and diminish long (term) distance. In this respect they maintain their contact through the Internet, instead of creating a distance as technology ever so often has been blamed of. My notion of social/wired cyborgs is especially apparent in the case of enhanced communication. The principle of communication is twofold: formal communication and aspects of social bonding, which creates and maintains social ties. A networked society has arisen in cyberspace. Although humans have always been interested

in constructing social relations, social networking constructed online is a unique way to maintain relations across continents. The network society, exists because individual cognition is distributed socially across groups of people. It is a network of individuals who interact through machines (e.g. computers, smartphones) in order to stay connected with other individuals. Castells (2004) refers to networked individuals as "nodes" and these "nodes" are connected across cyberspace, moreover, the nodes have week and strong ties depending on the relations between each node or individual. Social networks change over time; typically these week and strong ties change positions and sometimes become redundant. The communication in these networks thus mirrors the communication in offline-space. This flow of information differs from traditional one-way communication provided by the mass media. By extension the communication is a two-way-interaction (Castells 2004, 1-5). Social media, such as Facebook and Twitter, are the most common types of social networking. Hence, the cyborg concept of a society where humans and non-humans interconnect constitutes a cybernetic system of connections; in other words human and machine relations. As already discussed, cyborgs change in tact with society and have gained a stronger position in society after the network society arose. Humans have adapted to the technological change in society; in this case the cybernetic (inter)connection.

The social aspect of the Internet was a consistent and constant topic amongst the interviewees:

Kaja: "Well the Internet, I feel like when I am there I have control on what happens and if I am not, If the Internet [connection] doesn't work; then I feel that I lose the perspective of what happens in the world, what happens with my friends now you know. It is sort of like a channel I use to see what happens".

Eva: "Hmmm…eeh…at least… at least you become social…but, I'm social otherwise too but it's more… You probably talk to people more often when you know…via the Internet, then you see them [offline] in a way".

In these two cases the Internet functions as an extension of their connection to the environments around them. The Internet becomes a channel or a portal where they extend their social cognition and at the same time connect with friends and family through their social cognition. Moreover, cyberspace in general enhances their social abilities and extends their offline communication. Below, a part of the interviewee conducted with Sara will follow to illustrate how she uses the Internet to enhance her offline life.

Interviewer: "Can the Internet feel like a haven to you?"

Sara: "Eh, haven, yes and no, eh it's very nice to disconnect [from chores, school work] with for instance playing games on the Internet and the things like that; but what I especially feel with social media is that the Internet feels like an extension of my identity, increasingly, that I in a way, that I become visible in several channels, that I am quite present…"

Interviewer: "Yes, so… the Internet and or, your Internet life and your offline life become one"?

Sara; "Actually, yes, I am not one of those who… I usually don't talk to strangers on the Internet, I don't; I talk mostly with people that I also hang with on my spare time [offline]".

Interviewer: "Is it just kind of a part of your life?"

Sara: "Yes, it is a part of my life, it is a faster and more efficient way to talk to people who live further away [than Bergen], I do have friends from Oslo and other cities".

"Interviewer: "Yes.."

Sara: "So, it's kind of, well it's easier to maintain the network I have, so I can talk to them in social media and use the Internet to stay in touch".

Similarly to Kaja and Eva, Sara also uses the Internet as a social channel. Moreover, she emphasizes her use of social media which she believes to extend her identity. In other words this extension enhances her communicative skills as well. Hence, her social network is maintained through her social networking online.

Stephen M. Kosslyn (2006) who coined SPS (social prosthetics systems), which is a term used to explain how humans act as prosthetics to each other; as already mentioned above, claims that "we rely on other people as extensions of ourselves. Specifically, we rely on other people to extend our cognitive and emotional capacities" (Kosslyn 2006, 546). In other words, SPS explains how individuals mutually rely on each other to socially distribute their cognitive skills, just like a network. However, some individuals functions as prosthetics in a larger degree than others depending on the context of the situation that they are in (e.g. relationships, computer help from a clerk, counseling session). By extension, SPS and social (media) networks have the same goal to show how individuals are connected in networked systems. Similarly, actor-network theory (ANT) developed by the scholars Bruno Latour, Michel

Callon and the sociologist John Law provide an interpretation of how humans and non-humans are intertwined that could assist to explain how networks in general function and how central aspects of human bonding involve awareness about artifacts/objects, their manipulation and their mediating power of humans relations. Additionally, this theory could also assist to illustrate how the cyborg concept as a cybernetic organism is illustrated. The locus of ANT is the nature of things where human and non-human interaction constitutes of social agency. The social agency means that human and non-human actors occur in a collective network, a social network (Kirsch and Mitchell 2004, 688). Zoe Sofoulis stresses that "Haraway makes no secret of her indebtedness to actor-network theory and particularly Bruno Latour, a long-term colleague of hers, especially for the idea that agency is not confirmed only to human in sociotechnical systems" (Sofoulis 2002, 87). Sofoulis points out three aspects that Latour's ANT and Haraway's manifesto discuss about the boundary between human and animal, and the machine. In the Manifesto the boundary between human and animal is transgressed whilst in ANT animals and machines are non-human actors. The relation between human/animal and the machine are blurred and are "part of a lifeworld of sociotechnical hybrids" (2002, 89). Moreover, "the distinction between physical and non-physical is broken down in electronic technology, and through miniaturization" (2002, 89). Latour explains social agency with an example of the door. In order to use the door a network of non-human or human agency is needed. He discusses the options for how to close the door at a building in France. For this purpose someone's purpose need to be to close it. Latour lists several names for this agent, such as a "groom" or a "turnkey" (Latour 1992, 155-156). In this case a human and a non-human, the hinge, have solved the issue. However, according to Latour they have not quite solved it, because it depends on how reliable the human agency is to conduct his/her assignment in the first place. If the human groom were replaced with a non-human groom, a door-closer this would be an advantage "because you now have to discipline only one non-human and may" (1992, 157) leave other human and non-human factors aside. This is an example of an Actor-Network agency. According to A. Hepp et al, ANT can provide an understanding for "how various technologies come to be embedded in social life" (2004, 3). Hence, the wired/social cyborgs discussed in relation to ANT maintain their social life through the Internet and are thus embedded in social life through the Internet. To put it bluntly, Latour (1992) emphasizes that you should think of what humans would have to do if the nonhumans were not present. In this sense ANT can provide a deeper understanding of the notion of technology and how we are all depended and interconnected to technology to assist our cognitive and physical abilities. Nevertheless, the Internet functions as a prosthetic to

individuals regardless of cognitive and physical disabilities or abilities. Thus, I propose that it is not necessary to distinguish between use of technologies and assistive technologies, or to analyze disabled versus abled in connection to the purpose of their use of the Internet and ICT-technologies. In my opinion disabled versus abled may force a conceptual labelling of the analysis of Internet use among individuals with highly varying forms of skills and competences, as well as highly varying cognitive and physical constraints/abilities. However, humans use the Internet individually whereas sharing common factors to the use, regardless of disabilities and abilities, so the Internet has a prosthetic function to everyone's social and cognitive skills.

A good illustration of what happens when the non-human, in this case the Internet, is not present or disconnected is the question the interviewees was asked: *What would happen if you did not have Internet (access) and how would that affect your life?* Some responds to this question is already discussed above, however I would still like to highlight the following responds:

Eva: "Well, than it [daily life] would be very different, I was without [net connection] a weekend some weeks ago; I was able to do many other things [laughter], but it was …well… it was quite unaccustomed aaaand… a bit boring".

Interviewer: "Yeah, you become a bit dependent and…"

Eva "Yeah, you do, you have to check Facebook, and you have to check the mail and…

Interviewer: "Yeah, it's a bit like, it's fine to have connection all the time, you know".

Eva: "It wasn't a very social weekend, and it was a bit quiet (hehe), but it's not a big deal, it is fine, but I did notice it though".

Sara gave a similar answer where she pointed out how isolated she would feel, which is discussed above. Moreover, Lisa also illustrated how it would be like without a net connection by describing a day when she lost her net connection:

Lisa: "Although (hehe), if you are settled that you kind of have, okay now I'm going on a vacation, now I'm like in the middle of nowhere and I don't have an Internet [connection], than that's fine. But, if like the Internet is lost at home one day, than it's like NO, WE DON'T HAVE INTERNET [CONNECTION], WHAT DO WE DO!!?? (Laughter)... And it was so funny, because the Internet was lost at the student home where I live and we are like, I think

we were 12 people that lived there at the moment, or something like that, and then suddenly everyone sat around the kitchen table in the evening; and that was super nice, because everyone was like, everyone was more social then; there's nothing to do on the net."

In these cases there are two scenarios, one where the Internet connection matters for social interactions and another where not being able to connect to the Internet creates social interaction. So, individuals have adapted to a daily life with digital communication, however humans are also able to adapt to a situation where we normally would interact with non-humans to perceive certain tasks, and (then) to rely on just humans instead. In the latter case the flat mates relied on each other's social interactivity and constructed a network around the kitchen table. Each person around the table thus acts as a prosthetic to each other and connects by distributing their cognition socially. Furthermore, Kosslyn (2006) proposes two motivations within SPS. The first one is referred to as short-term SPS while the other is referred to as long-term SPS. As, mentioned in the introduction the first related to "specific tasks", while the latter relates to relationships.

> When another person assumes the role of a long-term SPS, he or she has gotten to know you, and has learned how to behave in ways that help you. What this comes down to is that his or her brain has become configured to operate as extension of yours! All learning involves changes in the brain, and this particular sort of learning involves changing a brain so that it operates well in conjunction with another brain. According to this view, then, to the degree that you become imbedded in a network of SPSs, your self is not confined to the neural tissue nestled between your own ears; rather, the self extends into other people's brains (Kosslyn 2006, 548).

I agree with SPS when it comes to how individuals connect and how long-term friends, for instance, can extend each other's brains thus become imbedded in a network. However I want to extend Kosslyn's ideas of a social prosthetic system further. Ironically, to a certain extent he acts as my prosthetics too; not in a long-term SPS though. By extension, the network society connects individuals together; typically family, friends, and acquaintances, which are connected in varies degrees. Moreover, as pointed out by the interviewees they maintain long distance friendship online whereas it is important for them to hold on to their relationship. Friends become imbedded in a social network that enhances their communication, and at the same time they are connected in offline-space. However, if it were not for all of the individuals who use social networks these networks would seize to exist, because the network

relies on individuals to stay connected. In social media individuals distribute their cognition onto Internet's public space; friends who chat in social media, for instance, depend on each other's cognitive and social skills. Similarly, Sara who points out that she does not have to meet her friends (offline) every day, because of the Internet and social media, in particular Facebook. So from a social constructivist point of view our minds are constructed due to social factors, especially in relation to other individuals, these factors play a role in how our cognitive and social skills evolve.

Another matter of how to distribute your cognition is through blogs, such as Kaja's blogs about her photography, as discussed in the previous chapter section. Kaja says following about how the Internet functions as a haven to her:

Kaja: "Yeah, it can do so, for instance, if you had a bad day, than it's a bit fun to read about other people who had a worse day than you to be fair (laughter). It is a haven, well for me who loves to explore that about media and to work with graphic… graphic design and the like; the Internet is a haven to me (hehe), and to blog, and to express my feelings."

Kaja uses her blog to express her feelings, thus she distribute her cognition socially where other humans can respond to her posts. Likewise, to Sara who sees her presence in social media as an extension of herself. Sara also says following about why she uses the Internet:

Sara: "It is the social aspect and that I love talking to people and kind of get attention… if I am alone, to get attention and answer to things I watch immediately".

Hence, cognitive and perceptual emotions such as *attention* are important factors to both Kaja's and Sara's online presence. In a sense individuals who give them attention act as their prosthetics because it helps their self-esteem and the sense of being isolated. Kai, also use the Internet for emotional reasons and point out following:

Kai: "Actually, what I often do in the evenings iiis tooo watch… oh, now I'm a bit embarrassed… eeeh, well, I'm watching sex-sites and the like… Well, there I feel that I have a bit, different roles, in a way, well there; I really want to, but I can't… Well, I have…".

Interviewer: "So, it becomes a haven?

Kai: "Yes, you could say so; I really want to and I have, I have been in different relationships, but I know that it doesn't work much… I am able to do it, but…well…it doesn't work much, but I really want to".

To watch sex websites is a common phenomenon. The researcher Julie M. Albright (2008) conducted a research where she conducted "an exploratory study of sex and relationship seeking on the Internet" (Albright 2008, 175). As a result the study shows that there are differences between sexes when it comes to who prefer what, females prefer to chat about sex, while males prefer visual images and videos (Albright 2008, 185). Either way there are several reasons for why someone would visit these websites, and in Kai's case these websites can help in relation to extending his social and intimate interactions. A quick Google search about *sex and disability* shows that this is a hot topic among Internet users. Below is one of the websites who provide discussions about sex as a disabled person: http://www.sexualityanddisability.org/. However, many websites provide this entertainment regardless of disabilities or abilities. The Internet enhances Kai's perception on sexuality and function as a platform which connects him to sex websites. Like *attention*, *sexuality* is also an emotion connected to motor and cognitive skills. The researchers Michael S. Kimmel and Rebecca F. Plante (2007) explain that sexual behavior is similar to other human behaviors. "We learn it from the people and institutions and ideas around us and assemble it into a meaningful narrative" (Kimmel and Plante 2007, 64). So in today's modern society sexuality can be perceived in online contexts. Kai, like many other humans, seeks sexual emotions and behavior in cyberspace whereas his cognitive skills are stimulated. This social behavior can be compared to how Kaja expresses herself through blogging, and how Sara uses the Internet to extend her identity and how she obtains attention from her friends when she is alone. How individuals orientate themselves in the world and in their life by means of technologies and evolving practices have been discussed in phenomenological terms as *life-world* coined by the phenomenologist Edmund Husserl in 1917 called *lebenswelt* in German (Zelić 2007, 413). The life-world is the world in which we perceive ourselves. We all have our own life-world; however the life-world is a world for everyone. Don Ihde's embodied (Ihde 1999) relations to tools show and insight to how humans and technology have an embedded relationship, and phenomenological experiences are not purely subjective (Ihde 1999, 22-23). The concept of life-world is embraced by epistemological constructivist theories where the focus lays on how individual perceptions are influenced by the environment, likewise to Ihde's definition. The analytical spiral of how individuals perceive themselves in cyberspace is thus based on subjective/objective experiences of the Internet and offline-environmental experiences. Kai's use of the Internet as a social sexual prosthetic is perceived as part of his lived experience from the social practices of life-world. Likewise, Kaja's and Sara's social prosthetics is

constructed in order to pursue attention from the live-world of friends and acquaintances. The Internet enhances social communication in various ways which connects individuals together.

4.4 Chapter summary

My aim in conducting this grounded theory analysis is to show how individuals' daily experiences in cyberspace function. People's individual Internet use is constructed by society we live in. Thus, this social constructivist research is shaped through a subjective and objective notion of the individual in society. Through the analysis I suggest that cyberspace can function as a material space, and cyberspace has been influenced by society, shaped and constructed to fit individual and societal needs. We emerge in cyberspace through our digital-devices when we interact with cybernetics. Typically humans interact through cyberspace with each other as human – machine – human relations or as human-machine relations. In this sense we are interconnected with the Internet and ICT-devices when we use them. It is in this notion I propose to define us as (partially) social/wired cyborgs.

The lay attitudes towards how people define and describe cyberspace could change in accordance to how ICT-device and the Internet are connected. I hope that my research can contribute to an awareness of how the Internet provides a material space to interact in. Moreover, the material practice is also embedded into our language, when we are on the phone, on the net, or on Facebook and other social media.

In addition we use our cognitive, social and motor skills when we are connected to the Internet where we perceive our individual and social cognition while interacting with the Internet and other people. As a result the enhanced information and communication may propose ideas of embodiment or even re-embodiment.

5.0 What can my research offer you?

With this research I want to provide a different way individuals can perceive themselves in cyberspace. My point of views is that cognitive skills function as a representation of you as an individual. Bodies are present in cyberspace through individual cognitive senses, which may be referred to as cyberspace. My study could show a modern way to discuss how the Internet may have a positive affect to our social factors in/of our brains, because the Internet allows us to maintain long distance relations. Moreover the social prosthetic function provided by the Internet may offer an opportunity to embody the social ties between friends who interact with each online. The notion of disembodiment can thus be reconstructed and redefined in modern

research of social online interaction. The cognitive processes of our mind/brain may also be affected by social interaction, and to a certain extent these cognitive processes represent our bodies as well. Additionally, I find it interesting how the informants and individuals in general speak of the Internet as a material space (e.g. on the net, on Facebook etc.), but at the same time they do not acknowledge the Internet as a material space. This material notion would be interesting to research further, especially in relation to how we perceive ourselves in social media contexts and practices. By extension I have discussed the cyborg concept in relation to our contemporary cyberculture and use of digital devices and the Internet as an alternative to the futuristic and dystopic image often presented by social scientists and other media theorists.

When including a variety of individuals representing part of our contemporary society, I hope that my research can provide an alternative way to discuss use of modern technology in relation to disabilities and abilities. The Internet may function as prosthetics to cognitive and social skills which affect people individually and socially, personal and societal factors constitute to grasp these notions. Thus, analytical aspects of researching use of ICT-devices and the Internet may illustrate that a de-compartmentalization of disabled-bodied and able-bodied use of technologies are possible. Individuals with physical disabilities tend to use the Internet for the same purposes as able-bodied individuals. By extension my research shows that the Internet assists humans in various ways and thus has a prosthetic function.

In addition to the features discussed in the analysis chapter, I did not analyze every detail of the data material thus some details were left out with the intension in mind that the data of the analytical process may not be that central to the research as a whole. However, the data

I would like to expand my research further by including other types of digital devices and to conduct interviews of individuals who use these devices on a daily basis to establish how and why they use these devices. Possibly the research would include a much broader target group of individuals who live in different parts of the world. If expanding the age as well this could affect the outcome of my research further. In addition it could also be valuable to elaborate further on cognition and the term *active externalism* coined by philosophers Andy Clark and David J. Chalmers (1998), suggesting that we live outside of our "skin and skull" (1998, 1). The philosophers argue that cognition can be extended through a "core cognitive process" (1998, 9). Although, the active externalists have been criticized because some theorists claim that "consciousness" cannot exist "outside of the head" (1998, 7), it could be valuable to

apply active externalism to illustrate how people perceive themselves in relation to use of modern technologies. One could perhaps argue that cognition is distributed socially, thus your cognition may be extended online and even traces of the cognition could remain in cyberspace; however this notion could easily construct an unintentional description of the mind in cyberspace.

5.1 Futuristic aspects

In addition to using digital devices discussed above (e.g. PC/Mac, smartphone, iPad) in order to connect to the Internet there are other technological devices which provide similar options. Some of these technologies are still in the initial phase, although human's curiosity to these devices is increasing as we speak. One example of this fascination is the Google glasses, which are "wearable computers" which provide "an optical head-mounted display (OHMD)" . In short wearable computers, as the name refer to, are small digital devices that humans can wear on their body, such as *smartwatches*. Smartwatches are actually an older invention than Google glasses. According to the web site *smartwatch.no* (Smartwatch) the first smartwatch was called *I'm Watch* where the users could connect to their smartphone via Bluetooth which could provide conversations, SMS, e-mail, music, app's, and more. Today, they have been upgraded and the company *Samsung* sells smartwatches where you can check your pulse when you work out, watch Net-TV and more in addition to what I'm Watch could provide (ref). Hence, they function as prosthetics similarly to smartphones. OHMD is a wearable display which reflects projected images which the users can see through. Another example of an OHMD is MicroVision, which brings "enhanced visibility to the world of mobility" (MicroVision Inc.). So, Google glasses' combination of wearable computers and OHMD, thus extends people's cognitive and motor skills as well as allowing them to expand their body schema because Google glasses expand their bodily spaces. The Google Glasses are thus incorporated into their cognitive and motor skills, especially in accordance to vision and prosthetic knowledge; which is a factor to Google and Google maps as well, as illustrated in chapter 4 above. Devices such as illustrated above may be the embodiment of human vision and knowledge.

Other ways to perceive embodiment is through *telepresence*. The philosophy researcher Luna Dolezal (2009) has defined telepresence as "a relatively recent term, coined to describe a wide range of experiences that pervade human life in the technologically advanced and affluent developed world" (Dolezal 2009, 208). Perhaps the aim of telepresence, in the first place, is for individuals to be close to each other even if they are not in the same room. As social

beings telepresence take social media software to a new step because individuals do not only connect through the Internet they can also feel the presence of individuals they are communicating with. Telepresence create a virtual presence of being somewhere else similarly to Virtual Realities, although telepresence reaches further than this because it extends, or in a way tele-transport human senses in order to simulate the presence of being in the same room as the people you are interacting with. Today telepresence software is used in business connections (Cisco), but will probably be available in domestic homes in the near future. In certain aspects telepresence embodies natural senses and stimuli. By extension, the future of telepresence may include tele-transportation of humans and objects. However, tele-transportation is yet a dystopic/utopic idea of human capacity.

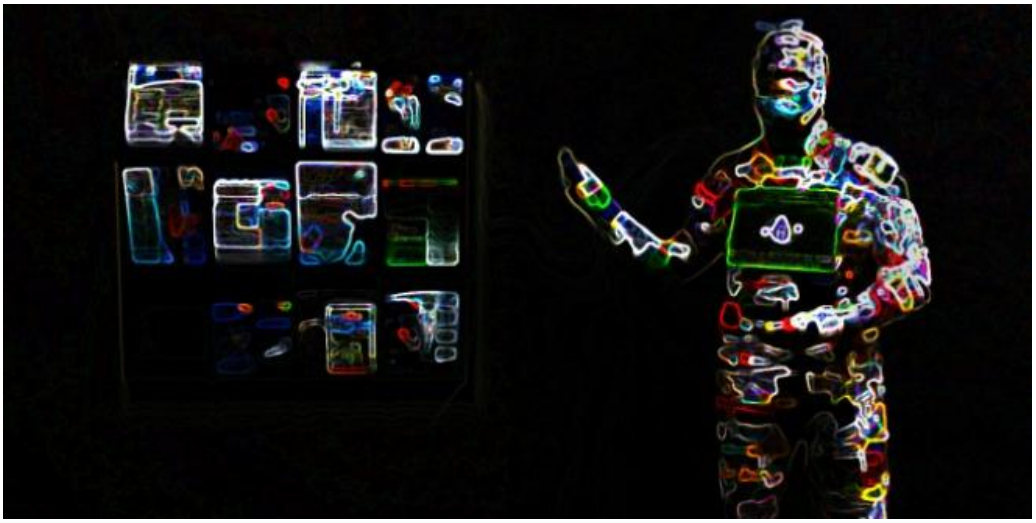
Modern technologies are often referred to as cybertechnologies. These types of technologies are built for various purposes and are meant to augment or extend the body or cognitive abilities. Cybertechnologies are prosthetics/prostheses which function as a material prosthetic externally or internally placed for medical purposes as well as other purposes. Typically these devices interconnect human and machine and construct cyborgs which may appear closer to the cyborgs of science fiction than the wired/social cyborg discussed in the chapter above. Some examples of cybertechnologies are "AWAK A Wearable Artificial Kidney", "Bone marrow stem cell artificial skin", "Otto Bock C-Leg Intelligent Prosthetic Leg", "Tooth and ear cellphone implant", "Cochlear Implant", and "Vision Enhancing Contact Lenses" from the website *Object a curations creation* (Galbraith). To elaborate further some of these objects are still in the initial phase. However, as society changes so do modern technology; humans' relation and need of technological enhancement will increase in the near future. Chris Hables Grey et al point out that "[t]here are many actual cyborgs among us in society. Anyone with an artificial organ, limb or supplement (like a peacemaker), anyone reprogrammed to resist disease (immunized) or drugged to think/behave/feel better (psychopharmacology) is technically a cyborg" (1995, 2). So, essentially our society is full of cyborgs a la Manfred E. Clynes and Nathan S. Kline with homeostatic devices assisting them to function properly.

Rapid technological changes also affect the Internet. One proposition is that the Internet will be influenced by use of objects, and is referred to as the Internet of Things (IoT). IoT "usually refers to a worldwide network of interconnected heterogeneous objects (sensors, actuator, smart devices, smart objects, RFID, embedded computers etc.) uniquely addressable, based on standard communication protocols" (Fortino and Trunfio 2014, v). The editor of the book Internet of Things Based on Smart Objects: Technology, Middleware, and Applications

Giancarlo Fortino and Antonio Trunfio (2014) propose several ways to construct IoT. The concept of IoT was introduced by Kevin Ashton in 1999. The vision of IoT is to connect "everyday objects to the Internet", which are referred to as "smart objects" (Fortino and Trunfio 2014,1). These smart objects will be distributed through middleware systems, such as "smart environments" of "Robot Operating Systems" (ROS) (2014 5). "The fundamental concepts of the ROS implementation are nodes, messages, topics, and services" (2014, 6). Such a smart environment is supposed to function in an office as a "cognitive office" (2014, 6). The concept of IoT may also evolve into the Internet of Everything (IoE). Dave Evans from the company of Cisco explains that IoE is meant to connect the unconnected. By definition:

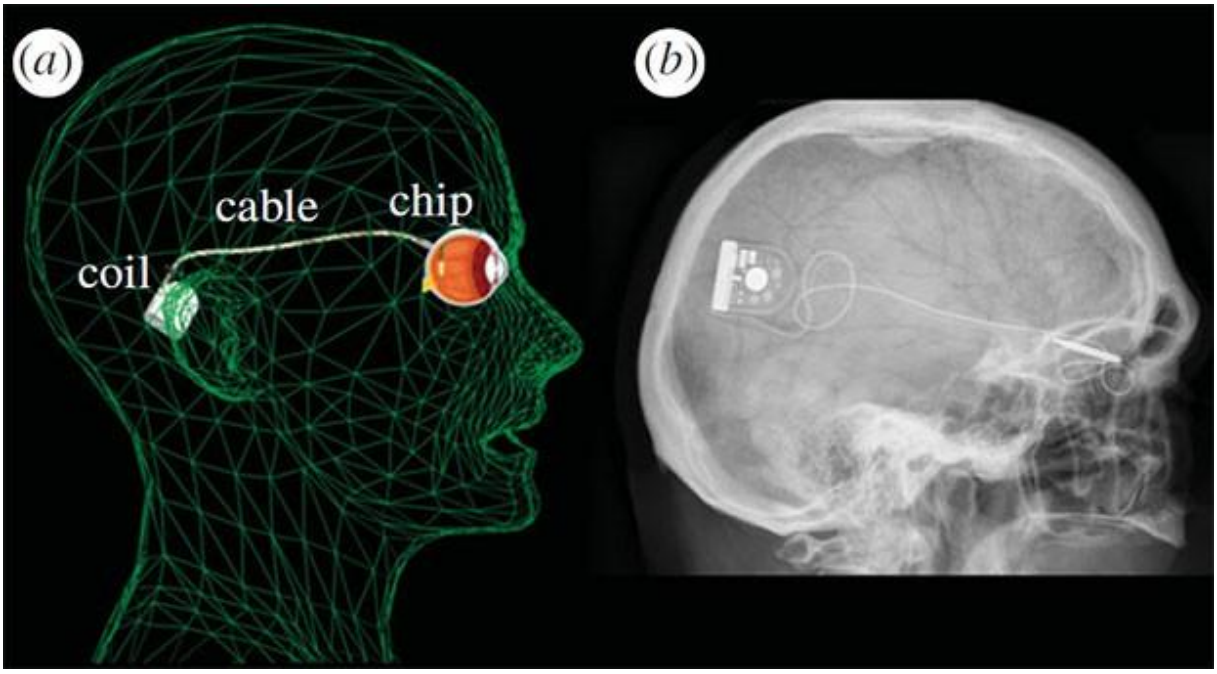
> As the Internet evolves toward IoE, we will be connected in more relevant and valuable ways. For example, in the future, people will be able to swallow a pill that senses and reports the health of their digestive tract to a doctor over a secure Internet connection. In addition, sensors placed on the skin or sewn into clothing will provide information about a person's vital signs. […] [P]eople themselves will become nodes on the Internet, with both static information and a constantly emitting activity system (Evans 2012, 3).

In this sense humans will live in a post-cyberspace world where the boundaries between offline and online spaces are obsolete. Cyberspace as we know it today will be completely blurred with the offline/environmental space, and a new space of networked networks will emerge. IoT and IoE, will thus take the meaning of the network society to a whole new level. To illustrate how IoT may function, below is an image which gives a good illustration of how we will be connected and incorporated into things, if IoT emerge in the near future.



Image/Kanu101Flickr

Even more drastic concepts of how the Internet will change occur to transhuman thoughts. Transhumanism is a movement of scientists, scholars and other thinkers who believe humans will be transformed into posthuman beings. Ray Kurtzweil is one of these thinkers and as already pointed out he believes that at one specific point in time, in 2045 to be exact, computers will blur human's natural mind with artificial mind and will become one singular mind, like a supermind (Kurtzsweil). Blurring of human and artificial minds is described in different ways, which are nothing like the Internet that we know today. The ultimate goal to some scientists is a networked computer chip placed inside the human mind. Computer chips are already in use, thus for a different manner. These chips usually have the same function as prosthetic limbs; however the chips control the mind, and in some cases can control robotic-arms. These types of chips are used in cases where a patience has "quadriplegia" (2012, Templeton) for instance. In such cases the mind control their bodily space and the body image changes in a way that I will suggest the chip actually function as a re-embodiment of an impaired body; however I do by no means suggest that the body become normalized. To illustrate how such a device function here is another image illustrating how computer chip may function:



Steve Dent 2013

The reason why I chose to include these photos is because both technologies illustrate how humans and technologies are interconnected, likewise to the cyborg. New technologies typically show a more literal sense of incorporation than what the Internet as we know it today can offer. Computer chips

According to Klint Finley from Wired Magazine "Google is building its very own artificial brain" (Finley 2012). The mind behind this artificial brain is Andrew Ng who emphasizse that to emerge an artificial brain with human brain can only be processed on children, because the brain is still not fully developed (Hernandez 2013). Apparently Google will continue to create cyber technologies in the future. To elaborate further from Googles Notion of artificial mind is the concept of transhuman transcendence into cyberspace. J. Jeanine Thweatt-Bates points out that there are fundamental differences to transhumansists point of view on posthuman concepts than cyborgs point of view posthuman concept. Transhumansism is often perceived as an "extension of Enlightenment humanism" (Thweatt-Bates 2011, 102). The key transhuman notions are to extend life for as long as possible with or without the human body. Likewise to Haraway's concept of a postgendered society without patriarchal stereotypes (Haraway 1991), transhumans do rarely see the point in gender distinctions as illustrated in society. In accordance to this transhumanists want to create postgendered humans that are "biotechnological" because genders may "limits the potential development of the human

person [and] is a kind of inverted essentialism, whereby the biological traits seen as formative for a gendered identity are resented rather than celebrated" (Thweatt-Bates 2011, 103). Thus transhumans wants to transform humans into posthuman species.

Possible future technologies, as mentioned above, suggest that the mind will be in focus and may suggest a full disembodiment or even a re-embodiment of humans mind and body. While technologies will continue to enhance humans in the future as well as, a new technological human race may be the result in the end. With the rapid adaption of the Internet it is natural to speculate in how these adaptions will affect human races. Maybe in the end humans will take the emergence to cyberspace into a whole new level and will not need his/her body anymore. Modern technologies evolves regularly

6.0 Conlusion

To sum up I conducted an epistemological research of individuals representing personal and societal perspective of Internet use. This approach is a grounded research method where I entered the role as a social constructivist in order to illustrate how the informants in my research base their own Internet use of factors constituted by society. Essentially, my research was constructed through inductive and analytical research of the informants' experience of using the Internet, as well as theoretical perspectives supporting features evolving Internet use. We are connected to a society where use of different physical and cognitive tools and objects are central to our everyday life. This central notion of an interconnected society is a feature of the prosthetic culture. Prosthetic cultures illustrate how contemporary cultures are interacts with modern technology. Typically, the 21th century is influenced by cybernetics and the network society as means to enhance people's communication and information capabilities. The essence of my research was based on how the Internet functions as a prosthetics to our brains. As part of a prosthetic culture we are living in a cyberculture where we interact through digital devices. The interaction takes place in cyberspace and with the emergence of portable technologies, cyberspace is increasing in size and the lines between cyberspace and offline environment tends to blur to a certain extent, especially because of the social influence of the smartphone, as pointed out by some of the informants such as Ivar and Sara. All informants have smartphones, and with the exception of Tommy, all of them use their smartphones to connect to the Internet. For most of them their smartphones are used every day for the purpose of online connection. However, all of them frequently use their PC/Mac when connecting to the Internet. Ivar, for instance prefers to use his PC instead of his smartphone, which he only use when he does not have an access to his PC. Some of the informants also owns an iPad, but rarely uses this device unless when travelling, such as Tommy expressed.

When conducting the analysis of my research some features of Internet use were striking, these features are the information they perceive online, to maintain social networks, and for leisure activities. There are several evidences for how the Internet functions as a prosthetic to our brain. These notions arose from a phenomenological analysis of the informants' Internet use. When retrieving online information, the Internet, is typically the first choice for most of the informants, especially to find news. They all favor the Internet when retrieving news, which is an interesting factor to how the media has changed in recent years. However, print books are still valuable in addition to the information space of Google and Wikipedia. The

reflections evolving Google and Wikipedia use among the informants stress how they use these websites to extend their own memory and information space, which they highlighted to be impossible otherwise. Sara even admits that the Internet, with an emphasis on Google function as an extra brain to her, so essentially the Internet may extend society's cognitive skills. My interpretation of the informants is that the Internet is used to retrieve information faster and more efficient than possible in offline environmental spaces. Another aspect is the availability of information, and these two factors combined are valuable features to how the prosthetic function is constructed. Typically, when retrieving information online, the person is looking for a specific detail, such Ivar who find offers on goods online. Moreover, if the information was useful and he actually managed to save time, the information was successfully incorporated to his memory space. In this case the Internet functions as a prosthetic to him, as well as other individuals in similar cases. However, Ivar argued that there is too much information to perceive at once, which is an obstacle to his school work in certain cases. I will argue that the Internet does not always have a prosthetic function, such as in Ivar's case where the information is lost in space, in figure of speech at least.

To elaborate further the Internet can also function as a social prosthetic in various cases. The interconnection between a person and cybernetics may extend his/her social interaction with other individuals. When humans interact with other humans in social networks online and also in offline environments, we distribute our individual cognitions. Moreover, the informants stressed that when they interact with other people through the Internet they become more social. This could actually indicate that in previous years a change in people's attitudes towards face-to-face-communication as social and online communication as more or less anti-social, and people may have been influenced by the culture of social media, in particular Facebook. Although many individuals interact with strangers online, this is rarely the case with either of the informants, however, they prefer to maintain contact with friends and family through Facebook, but also through Skype. The Internet maintains individual's relationships online, and the social prosthetics may embody social ties to maintain the relationship. Indeed, social interaction in cyberspace enhances our social abilities and skills, and our cognition is distributed among our social ties. Sara revealed that the Internet extends her own identity; to elaborate further she is influenced by the opportunity the cyberculture and cyberspace provide her. By extension one could argue that her extended identity is embodied by cybernetics when traveling in cyberspace. Furthermore, Internet as a social prosthetic can also offer ways to perceive emotions, such to seek attention from other individuals. As social beings, humans

typically seek attention from other people, similarly to Kosslyn's Social Prosthetic Systems, and through cyberspace people can give each other attention. Three ways the Internet function as a social prosthetic is through Facebook, through blogging and through visiting sex websites. When Sara is alone she uses Facebook as a practice in order to contact her friends to pursue attention from them and to give them attention as well. Kaja uses her blog primarily for the same reason as Sara, to pursue attention; however she distributes herself in a different way through personal photos and texts, and her blog is an extension of her perceptive cognition through vision and personal revealing of her as an individual. Kai uses the Internet as a sexual social prosthetic in order to express his emotions through perceptive cognition of his senses. The Internet can provide social practices as inquiry where social practices emerge in cyberspace, as shown above.

Additionally, the Internet is often perceived as a relaxed space, and all informants but Tommy confessed to perceiving the Internet as a haven where they can relax. Moreover, the haven factor essentially revolves around the home space of each person. So, to a certain extent cyberspace emerge into the home space, where the two spaces influence each other in various aspects. Lisa and Eva perceive the Internet as a haven when they are at home watching Net-TV, such as Netflix. To Kaja her blog functions as a haven where she can relax and express her emotions, similarly Kai's impression of the Internet is also that of a have, because he does not have to worry about his bodily space when relaxing at home in front of his computer screen connected to the Internet. Although Ivar agrees that the Internet may function as a haven to him, there are still features with the Internet which may be a stressful experience to him, such as watching Net-TV while chatting with friends on Facebook. Essentially, why the Internet is a haven to them is based on specific contexts related to where they are and who they are with. Elaborately, social factors play a central role to the concept of a haven in the first place. The haven is supposed to be a peaceful and quiet place, thus the fact that most of the informants emphasized that their home space as central to obtaining this state of mind and peace.

The cyborg figure represents individuals who are connected to cyberspace and cybernetics. The cyberculture has roots from the cold war era, and it is important to know about this background when discussing cyborg figures. As discussed previously Haraway claims that "The cyborg is our ontology: it gives us our politics" (1991, 150) suggesting that since cyborg figures are constructed through contemporary societies they constitutes the politics of society. Furthermore, the way that I have used the concept of a cyborg to illustrate how humans are

social/wired cyborgs, and may suggest that our ontology is derived from the cyberculture and the phenomena of information and communication-devices.

Futuristic aspect of the Internet and cyborgian aspect have, as illustrated, occurred through cyberpunk literature as well as in non-fiction literature; however there is no need for me to speculate any further. The time will show whether we will turn in to cyberpunk cyborgs or remain human as we know individuals today.

References

Asaro, Peter M. 2008. "From Mechanisms of Adaptation to Intelligence Amplifiers", In *The Mechanical Mind in History*, edited by Phillip Husbands, Owen Holland, and Michael Wheeler, page 149. Cambridge, Massachusetts: MIT Press

Bendassolli, Pedro F, 2003. "Theory Building in Qualitative Research: Reconsidering the Problem of Induction". *Forum Qualitative Social Research* Vol 14 (1) http://www.qualitative-research.net/index.php/fqs/article/view/1851/3497

Baym, Nancy K, 2010. *Personal Connections in the Digital Age*. Cambridge: Polity Press

Brey, Philip, 2000. "Technology and embodiment in Ihde and Merleau-Ponty". *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology* Vol (19): pp. 1-14

Bryman, Alan, 2001. "Interviewing in qualitative research". In *Social Research Method*, London: Oxford University Press

Bowker, Natilene and Keith Tuffin, 2002. "Disability Discourses for Online Identities". *Disability & Society* Vol 17 (3) pp. 327-344 http://www.tandfonline.com/doi/abs/10.1080/09687590220139883

Carr, Nicholas G. 2010. *The Shallows: What the Internet is Doing to Our Brains*. New York: Norton

Castells, Manuel, 2004. Informationalism, Networks, and the Network Society: a theoretical blueprint. Northhampton, MA: Edward Elgar

Castells, Manuel, *The Social Implications of Information and Communication Technologies*. http://glotta.ntua.gr/IS-Social/Knowledge-Social/castells_social-implications-info-comm-tech.pdf Accessed 05.29.14

Cisco http://www.cisco.com/

Charland, Louis C. 1997. "Reconciling Cognitive and Perceptual Thoeries of Emotion: A Representational Proposal". *Philosophy of Science*. Vol 64 (4) http://www.jstor.org/stable/10.2307/188561?Search=yes&resultItemClick=true&searchText=louis&searchText=c&searchText=charland&searchUri=%2Faction%2FdoBasicSearch%3FQuery%3Dlouis%2Bc%2Bcharland%26amp%3Bacc%3Don%26amp%3Bwc%3Don%26amp%3Bfc%3Doff

Clark, Andy and David J. Chalmers, 1998. "The extended mind". *Analysis* Vol, (XXI) pp. 1-22

Dery, Mark. 1997 *Escape Velocity: Cyberculture at the End of the Century*. Grove press

Dent, Steve. http://www.engadget.com/2013/02/22/microchip-implant-lets-blind-patients-see-light/ (30.05.14)

Davies, Lennard J. 2002 "Bodies of Difference: Politics, Disability, and Representation". In Disability Studies: Enabling the Humanities, edited by Brenda Jo Brueggemann, Sharon L. Snyder, and Rosemarie Garland-Thomson, 100. New York: Modern Language Association

Featherstone, Mike and Roger Burrows 1995. Cyberspace/Cyberbodies/Cyberpunk: Cultures of Technological Embodiment. London: Sage

Freund, Peter, 2001. Bodies, "Disabilities, and Spaces: The social model and disabling spatial organisations". *Disability & Society*, Volume 16 (5) http://www.tandfonline.com/doi/abs/10.1080/09687590120070079

Gray, Chris Hables, Steven Mentor, and Heidi J. Figueroa-Sarriera 1995. *The Cyborg Handbook*. New York: Routledge

Hutchins, Edwin, 2000. "Distributed Cognition". *IESBS Distributed Cognition* *http://www.bitlib.net/e/edwin+hutchins+university+california+san+diego.html*

Jensen, Klaus Bruhn, 2012. A Handbook of Media and Communication Research: Qualitative and Quantitative Methodologies. London: Sage

Kosslyn, Stephen M. 2006. "On the Evolution of Human Motivation: The Role of Social Prosthetic Systems, *In Evolutionary Cognitive Neuroscience*, edited by Stephen M. Platek, Todd Kennedy Shackelford and Joseph P. Keenan, page 541. Cambridge: MA: MIT Press

Kurzweil, Raymond, 2005. *The Singularity is Near: When Humans Transcend Biology*. United States: Viking

Haraway, Donna 1991 Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century". *In Simians, Cyborgs and Women: The Reinvention of Nature*. Routledge.

Lévy, Pierre, 1999. Collective Intelligence: Mankind's Emerging World in Cyberspace. Translated by Robert Bononno Cambridge, Mass.: Perseus Books

Lury, Celia, 1998. *Prosthetic Culture: Photography, memory, and Identity*. London: Routledge Morra

Mitchell, David T. and Sharon L. Snyder, 2000. "Narrative Prosthesis and the Materiality of Metaphor" In *Narrative Prosthesis Disability and the Dependencies of Discourse*, edited by David Y. Mitchell and Sharon L. Snyder, page 47. The University of Michigan Press

MacCall, Cade, 2013. "Social Cognition in the Cyborg Age: Embodiment and the Internet". *Psychological Inquir: An International Journal for the Advancement of Psychological Theory* Volume 24 (4) 314-320 http://www.tandfonline.com/doi/abs/10.1080/1047840X.2013.839921

McLuhan, Marshall, 1964.*Understanding Media: The extensions of Man*. New York: McGraw-Hill

Merleau-Ponty, Maurice, 2005. *Phenomenology of Perception*. Translated by Colin Smith. London and new York: Routledge

Mills, Jane, Ann Bonner, and Karen Francis, 2006. "The Development of Constructivist grounded Theory". *International Journal of Qualitative Methods Volume* 5 (1) pp. 1-10 http://ejournals.library.ualberta.ca/index.php/IJQM/article/view/4402

Moser, Ingunn, 2006. "Disability and the promises of technology: Technology, subjectivity and embodiment within an order of the normal". *Information, Communication & Society*, Vol 9 (3), pp. 373-395 http://www.tandfonline.com/doi/abs/10.1080/13691180600751348

Lenhart, Amanda, Kristen Purcell, Aaron Smith, and Kathryn Zickuhr. 2010. "Social Media and Young Adult". *Pew Research Internet Project*. http://www.pewinternet.org/2010/02/03/social-media-and-young-adults/

Nash, Ronald Alan, 1989. "Cognitive Theories of Emotion". *Noûs*. Volume 23 (4) pp. 481-504 http://www.jstor.org/stable/10.2307/2215879?Search=yes&resultItemClick=true&searchText=ronald&searchText=alan&searchText=nash&searchUri=%2Faction%2FdoBasicSearch%3FQuery%3Dronald%2Balan%2Bnash%26amp%3Bprq%3Dronald%2Baan%2Bnash%26amp%3Bhp%3D25%26amp%3Bacc%3Don%26amp%3Bwc%3Don%26amp%3Bfc%3Doff%26amp%3Bso%3Drel%26amp%3Bracc%3Doff

Joanna, and Marquard Smith, 2006. *The Prosthetic: From a Posthuman Present to a Biocultural Future*. Cambridge, Mass,:MIT Press

Palfrey, John, and Urs Gasser, 2008. *Born Digital: Understanding the First Generation of Digital Natives*. New York: Basic Books

Preester, De Helena, 2011. "Technology and the Body: The (Im)Possibilities of Re-embodiment". *Foundations of science*, Vol. 16 (2-3) pp. 119-137 http://link.springer.com/article/10.1007%2Fs10699-010-9188-5

Turkle, Sherry, 2006. "Always-on/Always-on-you: The Tethered Self". Forthcoming in *Handbook of Mobile Communications and Social Change*, pp. 1-19 *http://www.academia.edu/3129923/Always-on_always-on-you_The_tethered_self*

Turner, Fred, 2006. *From Counterculture to Cyberculture: Stewart Brand, the Whole Eart Network, and the Rise of Digital Utopianism*. Chicago: University of Chicago Press

Vaihyanathan, Siva, 2011. *The Googlization of Everything (and why we should worry)* Berkley and Los Angeles, California: University of California Press

Vignemont, de Frederrique and Farnè Alessandro, 2010. "Widening the body to rubber hands and tools: what's the difference". *Revue de Neuropsucologie* Volume (2) pp. 203-211