"To know is nothing at all; to imagine is everything"
Anatole France

Frightful Stories of Humans in a Technological World

Analysing humans & technology as figments of
the technological imaginary

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Abstract

Within this thesis I will deconstruct the popular human/technology dichotomy that we see constructed and reflected in frightful stories about the future of humans in an increasingly technological world. Theories of identification, signification and imagination will explain how the technological imaginary can be understood as an important part of the discursive construction of the self. Within Western scientific and popular discourse, technology is often imagined as something external affecting human nature. When we imagine ourselves to be uniquely human, we will experience the 'dehumanizing' effects of invading, human-like technologies as a threat to our human nature. I argue that this conflict itself is a discursive construction based in false dichotomies including nature/culture, human/non-human, real/virtual, self/other and subject/object. By exploring the powerful, formative and political effects of the technological imaginary, I affirm the relevance of this research. We are all figments of materiality and of imagination and therefore never natural, or unalterable. I will critique the Western concept of a unified, autonomous and conscious self that is created from the reflection of the (technological) other and attempt to break with dichotomies and boundaries that have long legitimized power relations in Western history. By providing a technological understanding of human existence, this research will create room for revaluating the dominant ideas about what it means to be human in a technologized world.

Keywords:

Discourse, Technological imaginary, Subjectivity, Categorization, Power relations, Unconscious, Cyborg, Co-constitution, Anthropocentrism, Dichotomies, Deconstruction, Uncanny, Anxiety, Desire

Figure 1. Word Cloud: a visual representation of the word frequency in this thesis (www.many-eyes.com).

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Chapter 1. Introduction: imagining human-technology relationships

Collective imaginary

A perfume bottle shaped as a female body, talking to animals as if they could understand, giving names to hurricanes; the tendency of granting human-like characteristics to non-human, inanimate objects is common to humans and is referred to as *anthropomorphism*. Anthropomorphism often arises in technological design as technologies are traditionally designed to resemble human behavior in order to substitute for human actions. The industrial revolution even relied on machinery to carry out automated tasks that were traditionally performed by humans. These automated machines might have had 'arms' to carry out these human tasks, but that is where the resemblance with humans stopped. However, as technology and human evolved, they became more and more alike. Advanced technologies of the 21st century not only simulate human behavior but also human intelligence, appearance and personality. Databases have a remarkable memory, phones have become smart and robots have grown a familiar face. Furthermore, advanced computer programs simulate the processes of the human brain by interacting with its environment, learning from mistakes and recognizing a face and voice.

On the one hand we believe that these technologies will benefit humanity enormously. In the context of 'intelligent machines', Jeff Immelt, a successful American business executive, writes:

> "This Industrial Internet is not about a world run by robots, it is about combining the world's best technologies to solve our biggest challenges. It's about economically and environmentally sustainable energy, curing the incurable diseases, and preparing our infrastructure and cities for the next 100 years" (Immelt 2012)

On the other hand, what happens if technologies actually reach and exceeds human capacities? This possibility has urged many of us to become cautious and even fear certain technological inventions. The concern is that by giving human qualities to machines, these machines won't be just like us; they will be even better and in the worst-case scenario, replace humans (Turkle 2011).

This example proves that in an increasingly technological world, we tend to perceive technology as either providing opportunities or creating threats for humanity. Within the technological discourse we can roughly distinguish two camps; cyber optimists on the one hand and cyber skeptics on the other hand. The former believe that technical solutions are morally desirable improvements of the human kind and therefore technological developments are entrenched with ideas of social and individual progress up to the point that 'new' becomes a synonym for 'better'. The latter believes that technological involvement could pose a threat to the future of mankind and wants to protect that which is 'authentically human' against invading technologies that alienate people from some original state of humanness. Over the years, this binary division is reinforced by representations of new media technologies within the popular and academic discourse, associated with both utopian and dystopian statements about the (social) effects of technology (Schäfer 2011, 25-26).

In his latest work, Schäfer effectively demonstrates that technological discourse, consisting of the terminology, metaphors and associations that are chosen to represent and describe a certain new media technology, creates a certain meaning and thus reality of it (Schäfer 2011, 25). Discourse feeds a collective imaginary, the lens through which people perceive the world and novelties gain sense (Mordini 2007, 544). Through a specific use of language, one actually constructs a kind of reality. The study of discourse as a means through which a sense of reality is constructed has become an important scientific tradition and interdisciplinary approach that suggest that the framing of the public mind is accomplished by the construction of meaning through discourse. Discourse analysis has created new ways of thinking about reality as discursively constructive. The arguments that I will present within this thesis are therefore based upon the idea that discourse produces reality instead of representing it. This is why examining how discourse operates, also on the level of the collective imaginary, is crucial for understanding the meaning that we associate with technology.

Within this thesis I would like to take it one step further by suggesting that technological discourse not only creates a certain meaning of technology, but also influences how we imagine ourselves in relation to technology and vice versa. The technological Imaginary now becomes an important part of the discursive formation of the self and this is why it is important to examine what the technological discourse tells us about what it means to be human in a technologized world. In acknowledging the power of discourse to produce social reality as lived social relationships, I will examine the ideas, beliefs, values, expectations, and attitudes that this collective imaginary produces and explain what this means for the way we even begin to understand humans in a technological culture. The following headlines as part of the technological discourse are a good example of the discursive formation of human-technology relationships: "Could technology ultimately destroy human civilization" (Yahoo!7 2012); "Almost human: New era of robot tech edges toward reality" (Markoff 2012), "Will robots be our loyal servants or a threat" (Devine 2012) and "Is Facebook Making Us Lonely? (Marche 2012). These examples suggest that within Western scientific and popular discourse, technology is often theorized as something external affecting human nature and is therefore imagined in oppositon to humans.

The problem is that in general discourse produces relationships, ordering and categorization based upon arbitrary boundaries that appear normal, natural and innocent but aren't. Dominant conceptions of hierarchical differences between for example, the (human) self and all that is considered 'other' are generally confirmed within these dominant discourses. Although the term collective imaginary is commonly associated with being fictive or unreal, I will argue how imaginary identification can have real, powerful and political effects. People tend to identity with these so-called natural boundaries and hierarchical categories, which dominate how we define ourselves in relation to others and eventually produce inequalities that lead to suppressed and marginalized (social) positions. Social categories derive their meaning from their position within a series of binary oppositions in which all subjects and objects are classified into two groups until all are separated into their own unique category. Important for my analysis are the dichotomies that are a constituent part of this discourse and even so fundamental as to appear self-evident but nevertheless frame our way of looking at the world and ourselves.

What I will further demonstrate and at the same time critique with this research is the purely anthropocentric and instrumental way this particular discourse tends to deal with the world, and how this becomes a natural way of understanding and explaining ourselves in relation to others. The relationship between humans and technology seems to reflect (on) the relationship between self and other, nature and

culture and subject and object, all in which the other is perceived as resource for appropriation or incorporation by the self.

Living inside stories

This research will depart from Haraway's understanding of the world as living inside stories. Haraway claims that "there's no place to be in the world outside of stories" and that all objects are "frozen stories" (Haraway cited in Bell 2007, 121). Acknowledging the fact that I am part of the discourse that I will study, I do not pretend to provide a critical analysis as neutral outsider. As all scientific or popular research, this research will create a story and with this story I will enter the contest for meanings. My intention is to provide an alternative story to the accepted dominant stories about technology, in an attempt to expose and challenge basic assumptions about humans and technology and to overcome unjustified dichotomized thinking that separates humans from technology, nature from culture, subject from object and self from other. I will explain how the collective imaginary becomes really real as it produces power relationships based upon differences that create inequality in the material world. Seen the significance of stories in the production, maintenance but also change of power relations, it is important to create different stories that people can identity with, that undermine the dominant one. This research will therefore expose the effects of inequality and distance produced by the dominant Western myth and explore alternative stories that recognize differences and at the same time produce effects of connection. In this way I hope to provide a meaningful contribution to the discourse I investigate, which will be the aim of this study.

Before moving on, I will clarify my understanding of the concept discourse. A discourse includes not only written but also spoken texts, images and essentially everything that functions as a carrier of meaning and therefore plays a role in everyday communication and institutionalized forms of communications such a mass media (Berg, van den 2004, 30). In a narrow sense discourse refers to a semantic system that is constructed through the use of language, and in a more broader sense discourse refers to meaning that is (re) produced by more comprehensive social practices, such as through the designing and producing of technologies (Berg, van den 2004, 32). Acknowledging the interrelation between discursive processes and social context in which these processes take place, my intention is to analyze the production of meaning through written narratives.

Another common division is made between popular and academic discourses. According to Schäfer, the popular discourse is aimed at introducing and promoting new technologies to a broader audience and the academic discourse analyses and reflects on their social use and impact within society for the interests of experts within the field (Schäfer 2011, 25). Both the academic and popular discourse carry popular misconceptions, in which the latter is considered to be purely factual, scientifically substantiated information and the former lacks scholarly reflection and analysis and therefore represents a more rhetoric approach. This leads to the common belief that the ideas that are represented within academic texts would stand closer to 'the truth'. As with every opposition brought forward within this thesis, these two apparently separated discourses can easily overlap and may not even be fundamentally inseparable. Schäfer notes how both discourses have the tendency to trespass borders 'due to a lack of specialized scholarly discourse on the topic and the need to create attention for both the emerging media and its academic framing' (Schäfer, 2011, 25-26). What I will furthermore argue is that there is no such thing as objective science producing objective truth but only dominant stories that produce collective

imaginary. As I explained earlier, researchers of any kind construct a reality by the production of meaning through discourse, which makes a clear distinction between scientific knowledge and popular 'everyday knowledge' difficult to substantiate. Within this research, I will be exploring those texts that fall in between the above categories and are also referred to as popular academic texts; stories presented to an academic but general-interest reader that have become popular and thus influential in shaping the collective imaginary as it relates to technology.

Frightful stories

Hopeful and positive stories about technological progress and improvement have always fed our collective technological imaginary. On the other hand, we notice how frightful stories also end up being a popular way of organizing technology into a meaningful context (Mordini 2007). Stories about on perfection and controllability-oriented technology elicit feelings of fear and uncertainty about the future of humanity as we know it. Either based on hopes and dreams or fears and anxiety, popular stories about technology are founded on the same conceptual dichotomies, such as self and other, human and non-human, nature and culture and subject and object that separate humans from technology. Although utopians might have had their fair share of critique, dystopians seem to be somewhat ignored in their blunt positions and basic assumptions. Through a deconstruction of their dichotomous thinking, I want to provide a response to these frightful stories by revealing binary oppositions that are used in the construction of meaning and values, and exposing unargued assumptions about humans, our environment and the technologies that are undeniably part of and shape the relationship between the two.

I choose the latest work of Sherry Turkle, *Alone Together: Why we Expect More From Technology and Less From Each Other* (2011)*,* as being exemplary of this specific technological discourse. I argue that Turkle creates a social reality by discursive practices and that these constructions have become axioms, i.e. self-evidently true. Demonstrating Turkle's influence on the collective imaginary by studying the (more) 'popular' discourse with respect to similar semiotic references (metaphors, associations), affirms the relevance of this research. I will look critically at the descriptions of technology and its relation to human beings and explanations of events to identify binary oppositions presented as natural distinctions instead of creations as a result of normative thinking. By means of deconstruction I intend to provide a new reading of this text by exposing and problematizing the underlying assumptions and the persistent separation and opposition of categories that affords certain logic of dominance to prevail. By deconstructing and reworking the dominant dichotomies within this technological discourse, I aim to uncover the hierarchical, constructed and conflicting character of any opposition as opposed to its innocent and natural one. Following Derrida's "reading strategies", the opposing terms within the dichotomy must be reversed and displaced in order to prove that their position is neither natural nor unalterable (Grosz 1989, 30). By displaced I mean: "not *out of the structure altogether* but by positioning it within the core of the dominant term as its *logical condition*. This makes explicit the unacknowledged debt the dominant term owes to the secondary term" (Grosz 1989, 30). The apparent opposition between identity and difference will effectively illustrate this relationship. If identity marks the dominant side of the dichotomy, than difference is the absence of identity. This means that any primary term derives its identity from the suppression and absence of its opposite. For example, what we consider to be human depends on what falls outside of this category. Humans derive their identity from the suppression and absence of their non-human opposite.

Inspired by her recognition that humans and their non-human companions are intimately bound, Haraway's famous discursive phenomena of *cyborg, companion species* and *naturecultures* will serve as a source of inspiration and starting point for this research (Haraway 2003, 2006). With her *Cyborg Manifesto* Haraway provided new vocabularies and insights for the analysis of the interaction between people and technology that revealed the instability of natural categories and essentialist oppositions. Originally an icon of the cold war, the cyborg as a conceptual model belongs to other times. Although some might consider the configuration of the cyborg to be an obsolete concept, I argue that the cyborg is still a valuable and relevant conceptual model because of the continued need for new ways of thinking about human-technology relationships that undermine dichotomized thinking and hierarchical categories that remain dominant in Western academic and popular discourse. Haraway's work can be interpreted as a discursive intervention that counters the dominant human-technology stories of our time. According to Haraway, imagining concepts as polar opposites or universal categories is the popular and foolish way of explaining or understanding how humanity fits into the world and how we relate to non-humans and our objectified environment (Haraway 2003, 2006). Following in her footsteps, I intend to provide an alternative perspective to the accepted ideologies that continue to shape the way stories about humans and technology are told.

Chapter 2. Theoretical context: the power of unconscious forces

The following chapter will provide the theoretical framework of my research in which I will explain how reality and everything 'natural' appears to be constructed by the unconscious forces of language, desires, fears and normalized power. These unconscious forces are important for my analysis because they ultimately shape and determine our experience of the self and the (technological) other as separate entities. First I will elaborate on the concepts of the unconscious, the imaginary and the symbolic in relation to subjectivity and eventually conclude that any fixed identity, in this case human identity, is illusive, constraining and certainly not natural. I intend to further criticize the conceptual boundaries of human identity by discussing the exercise of power through the construction of power relations and marginalized positions.

Psychoanalysis

The assumption of unconscious mental processes has led me into the world of psychoanalysis; a psychological theory made famous by Sigmund Freud at the end of the 19th century. Psychoanalysis is a medical treatment also referred to as the "talking cure" (Mooij 1975, 15). The patient tells a story which the analyst tries to interpret and decipher. By doing this, the story interprets into something different to the initial story. The analyst is especially attentive of the gaps in the patient's narrative; what is left out or suppressed in what appears to be a unified or logical story. Freud claims that in these gaps, one can situate the unconscious or rather the unconscious meaning of the text (Mooij 1975, 15). Like the unconscious, the repressed within a story does not lose its power; it acts on the appearance of the whole:

> "Wat ontsnapt aan een bepaald verhaal blijft toch gestempeld door het verhaal waar het geen ingang vindt. (…) dit onbewuste levert toch, krachtens deze samenhang, een verhaal, *un discours de l'autre*. Dit verhaal is te interpoleren in de lakunes die het bewuste verhaal laat" (Mooij 1975, 130-131)

A theory of the unconscious provides insight into things that might appear invisible (natural) but nonetheless have determining and forming effects. Realizing that psychoanalysis as a medical treatment is now commonly considered obsolete, Freudian notions of the unconscious remain relevant for exploring the technological imaginary of today. In this way we might understand how unconscious impulses such as social and psychological desires and fears, feed the popular or collective imagination as it relates to technology.

Repression of deeper, unconscious impulses can be understood in the light of Freud's concept of humans as desiring creatures. In a reaction to the Enlightenment view of humans as essentially rational beings, Freud claims that humans primarily and originally desiring beings. Humans are driven by "unconscious wishful impulses that arise from the unconscious", which we instantly want to satisfy (Flax 1990, 53). Freud furthermore states that relationships made with others are always narcissistic because "others exist for us as means to satisfy our needs, to relieve frustration, or to restore equilibrium" (Flax 1990, 54). This means that the purpose of connection is "self-satisfaction, not concern for the other as an independently existing being (Flax 1990, 54). This insight could be relevant for understanding the

underlying motivation of most human-technology relationships in which technologies are increasingly cast in the role of the (subordinate) other that exist only to serve human needs.

The imaginary order

To better understand unconscious impulses in relation to discursive practices and collective imaginary, my research will draw on Lacanian psychoanalysis, which combines psychoanalysis with structural linguistics and perceives language as part of the unconscious processes that constructs the relationship between the self and the other. Jacques Lacan's main premise is that the unconscious is embedded in language and that the subject, its desires and experiences are in fact linguistic constructions in which our unconscious plays a decisive role. Challenging the idea of 'human nature' and the notion of the human as an autonomous subject with a fixed identity, Lacan theorizes the subject as a construct with a false sense of self.

The imaginary order is the first stage of the development of subjectivity in which the image forms the dominant basis for identification. The first 'self' appears to origin in something other than itself: an image in the mirror. In *the mirror stage*, a child sees itself reflected as a whole in the mirror and will begin to identify itself with his mirror being. Important to note is that the image is proposed as 'truth' and not as the 'sign' of one's own body. In a similar yet different context, an *imaginaire* or the *imaginary* may refer to a realm of images, representations and ideas of what people in an incomplete state of being long for and desire: completeness (Lister et al. 2009, 67). The imaginary is closely linked to the desire to be a self-unified and conscious human being. As a result of our split being (conscious/unconscious), one lacks the ability to fully express and know oneself in an immediate way. In the other, which is closely linked to the self and of which the mirror being is a metaphor, we vainly try to find a way to fulfil our lack of unity. In this way, the human becomes subject to an unsatisfiable desire for a fixed identity, identifying and internalising images in order to create a (false) sense of self.

The feeling of wholeness provided by this image is however an illusion because although the child sees itself as a whole, autonomous unity, it rather experiences itself as underdeveloped, dependent and incapable (Mooij 1975, 79-83). This split will continue to determine the human subject. The imaginary is therefore not only referred to as the field of images and imagination but also of deception. In his interpretation of the work of Lacan, Dylan Evans writes: "The principal illusions of the imaginary are those of wholeness, synthesis, autonomy, duality and above all, similarity" (Evans 1996, 82). This however does not mean that imaginary is anything close to the opposite of 'real', on the contrary, imaginary identifications have real (formative) effects. Furthermore, the imaginary identification that first appears in the mirror stage will always be part of the subjective experience of the self and the other. The identification is with the image (of the other) that is equated with the self and therefore the other is not recognized in his otherness. As any form of identity is shaped in relation to others that are recognized as reflections of ourselves, the imaginary identification is also experienced as alienating.

The mirror stage creates a tendency that will dominate in further life: the tendency to constantly try to find and capture the imaginary unity of an ideal self in the reflection of the other. The 'other' here doesn't only refer to human beings, in this case it can also refer to the 'technological other'. For example, one speaks of *technological imaginary* when "dissatisfactions with social reality and desires for a better society are projected onto technologies as capable of delivering a potential realm of completeness' (Lister et al.

2009, 67). The desire of human beings to know and articulate oneself is in this case projected onto technology. The imaginary identification with the technological other, as a reflection of the self, not only gives rise to feelings of completeness but also to feelings of uneasiness. Technologies and our technologized world full of non-human agencies, virtual companions and human-like robots, challenge our understanding of what it means to be human. In the mirror of technology our perception of ourselves is the same and yet different and what we understood to be human, has become unfamiliar and thus uncanny. In his essay *Reading Machines* (2005)*,* Fred Botting argues that "through fictional and media techniques, the uncanny spreads" (Botting 2005, 21). Building on the work of Freud, Botting reflects upon the uncanny aspects of technology through the process of identification with the technological other:

> "(…) the subject identifies himself with someone else, so that he is in doubt as to which his self is, or substitutes the extraneous self for his own. In other words there is a doubling, dividing and interchanging of the self" (Freud cited in Botting 2005, 19)

The symbolic order

As Botting effectively explains, stories are powerful tools for identification and (re)articulation of the self in relation to the other. The imaginary is closely linked to what Lacan refers to as the *symbolic order,* in which human subjectivity is further constituted in and through the use of language. Although the subject is essentially split between its conscious and unconscious agency and between the self and the other, both sides are embedded in language. The speaking man distinguishes, identifies, presents and affirms himself and his world by using words and telling stories (Mooij 1975, 93). On the other hand, like the imaginary identification, the symbolic identification is also associated with objectification and alienation. Because no one creates his or her own language, the speaking subject has to fit his story into a pre-existing system of language and uses the stories of others to create its own. The subject may refer to itself in terms of 'I' or by stating his or her first name, but it is never fully present to him or herself because there is no immediate expression possible as any expression is (symbolically) mediated (Mooij 1975, 92-97). Although man's desire is to express its 'truth' in words, any attempt to self-represent is ultimately doomed to fail. Words are incapable of capturing any human essence because it simply does not exist. In a strict sense, the subject is indeterminable in the symbolic order and therefore the identity that we have constructed with words also has an alienating effect on us. Simultaneously a process of objectification is put to work because the subject not only arises but is also labeled by the stories he tells (Mooij 1975, 128). The subject speaks and is spoken by language. He obtains an identity but loses himself because he is turned into an object within his own story and the stories of others: 'Je m'identifie dans le langage, mais seulemant a m'y perdre comme object' (Lacan cited in Mooij 1975, 93). This results in another split: the speaking subject represents itself as a subject, but is also an object of the speaking subject.

In the tradition of Freud, we need to understand speaking as both revealing and concealing. The unsaid is equal to the unconscious. While the unconscious doesn't have a voice of its own, "it can only speak *through* or as consciousness" as that what intervenes conscious discourse as "gaps, silences, moments of indecision and error" (Grosz 1989, 23). The repressed unconscious consisting of forbidden ideas, desires and impulses will continue to seek out conscious expression and translation into the

symbolic order. In his return to Freud, Lacan believes that we should read stories like the analyst listens to stories: between the lines. A return to Freud therefore means a return to the repressed (Mooij 1997, 18).

Within the concept of technological imaginary, language (symbolic), image (imaginary) and subjectivity (reality) are all closely connected to each other. This means that through the technological imaginary we can begin to explore the repressed ideas, desires and fears that are locked into the discursively constructed concept of the human self in relation to the technological other. Before moving on, I will reveal the relationship between conventions, power and the collective imaginary in creating subjectivity in order to argue that the technological imaginary is of political importance.

The binary logic of language

Thus far I have explained that the concept of the human as a fixed and unitary identity is not a product of nature, but that of language and the laws that regulate it. In his theorization of language as a system of signs, Lacan is clearly inspired by the work of linguist Ferdinand de Saussure. Lacan believes that the system of language should be understood as a social institution that is independent of external (human) influences and is built around an internal arrangement of differences (Mooij 1975, 43-46). To further explain this, I will first return to the linguistics of de Saussure which teaches us that the sign is made up of two components: the spoken sound and written mark (signifier) on the one hand and the concept (signified) on the other hand. What is important here is that the relationship between signifier and signified is not natural but arbitrary. There is no natural force that makes us use the word cat to describe this specific animal. A signifier (or signified) is defined by its difference opposed to other signifiers (or signified) (Mooij 1975, 46). For example: a cat is a cat, opposed to a dog. This means that a signifier isn't related to an object in the external world to which it means to refer; it's related to other signifiers as they form a systematic view of the world. In a very effective way, Nick Mansfield compares language to the pieces in a game of chess:

"You can use anything as chess-pieces, as long as it is clear to the players what defines the system of differences between the various pieces that allows them to move in specific ways (small identical pieces are pawns, larger individual ones are knights, bishops, the king etc.). It is not important what you use as a king, queen, rook, and pawn, as long as everyone knows which is which. In the case of signifiers, it does not matter which particular marks or sounds are used to denote a certain object", (…) it is "the complex web of differences which allows us to recognize the minute but crucial distinction between 'cat', 'bat' and so on" (Mansfield 2000, 40)

This set of differences and the arbitrary relationship between signifier and signified makes up the system of language that is thus governed by convention. Conscious discourse conforms to these rules of difference, logic, grammar, and coherence. The (Western) system of language and thus of though, is a binary system that forms and organizes human thought and experience through a logic of binary. Foucault refers to these practices as *dividing practices*; turning reality into a logic of binary oppositions that helps us to create order out of the complexity of our daily experiences with reality (Foucault 1982, 777). The opposing parts don't coexist peacefully because they are not equally valued. Dichotomous thinking allows us to categorize things into a certain order of domination. The dominant part of the dualism has the privilege of defining itself and defining its opposite other by all that it is not (Grosz 1989, 27). Important for my analysis is the

way in which Western language and thought creates a false sense of unity by reducing experience into binary and evidently natural oppositions or dichotomies that include identity/difference, self/other, nature/culture, subject/object, human/non-human (Flax 1990, 36). In all these common Western dualisms, humans occupy the first and dominant part of the dichotomy. As I already mentioned in the first chapter, popular stories about technology are often founded on the same conceptual dichotomies as mentioned here. These dichotomies suggest that humans should not only be imagined in opposition to, but also considered more valuable than technology.

Words as powerful instruments

As human beings cannot be immediately and truthfully articulated in language, knowledge is not an undistorted expression of reality in truthful representations. Based on the above reasoning, reality and (self) knowledge can be neither categorised as objective nor subjective but rather constructive or constructed. Moreover, each discursive formation is both enabling and limiting and the 'truth' takes on some forms, and not others. In this way, truth is an effect of discourse and knowledge can be understood as a source of power. This doesn't imply that through language we can make everything true, but rather as Marianne van den Boomen so adequately puts it: 'het gevecht om de inrichting van de werkelijkheid gebeurt met taal', and although each appointment, each creation is a lie, the fact remains that any appointment activates a chain of ascription, alignment, action and intervention (van den Boomen, 1994). This is how we can interpret words as instruments for enforcing meanings. How we speak, and equally importantly, what is left out when we speak, provides and limits the ways in which we *can* think and speak about 'reality'. Discourse is powerful as it shapes practices, relationships and attitudes.

In order to further elaborate on the concept of power in relation to discourse and knowledge production, I will now introduce Michel Foucault as one of the most influential philosophers who writes about the power of discourse to produce social reality. Foucault's theory leads away from an analysis of power as an instrument of coercion, towards the idea that power is embodied in realms of discursive practices in which knowledge or rather *regimes of truth* are formed and produced (Foucault 1991, 194). According to Foucault, knowledge is always connected to power, not only reflecting it, but also producing it:

> "Knowledge linked to power, not only assumes the authority of 'the truth' but has the power to make itself true. All knowledge, once applied in the real world, has effects, and in that sense at least, 'becomes true.' Knowledge, once used to regulate the conduct of others, entails constraint, regulation and the disciplining of practice. Thus, 'there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time, power relations" (Foucault 1977,27)

Grand normalizing discourses provide concepts and categories by which we structure experience and simultaneously suppress those discourses that differ with or undermine the supremacy of the dominant one. The dominant story of our time is the Western philosophy of man and history based on the logocentric system of thought and the dichotomous structure on which it relies (Grosz 1989, 31). This discourse produced the concept of a self-unified subject, considered as a rational master of truth and the logic of identity in which the subject can immediately know and represent oneself as a unified whole (Grosz 1989,

ix).

As Lacan and Freud already demonstrated the impossible and alienating character of these concepts by theorizing the subject as incapable of self-knowledge, radically split and therefore different from itself, Foucault continues to prove the oppressive character of any fixed identity by arguing that knowledge (of the self) is connected to normalizing and disciplining practices. Foucault demonstrates that every 'natural' identity is in fact a construction of production, signification and power, which means that we are much more determined by our environment and the prevailing norms and values, than we determine ourselves (Foucault 1982, 778). Power is exercised and distributed in a grid of discourse, institutions, architecture, instruments and classifications. An important feature of modern power is that it is not imposed on but rather power becomes a part of us when we subject ourselves to these institutions and processes of subjectivity (Foucault 1982, 777-795). The human turns into a subject that is "tied to his own identity by a conscience or self-knowledge" (Foucault, 1982, 781). Controlling behaviour and the sacrifice of a subject's own free will are, according to Foucault, the new *technologies of the self* that bring about power relations by complex systems of control and surveillance (Foucault 1988, 45). Foucault furthermore claims that ordering and categorization are inevitable part of what he calls *modern subjectivity*, but that should not be confused with some form of pre-consisting reality or natural order (Foucault 1982). It is however extremely difficult for us to be aware of the fact that there is a power mechanism at play, instead of a natural order, because of our impulsive acceptance of the social reality as it unfolds before our eyes. Stories and their dominant hierarchical dualisms are internalised, to mean that people accept them as natural ways of understanding how humanity fits into the world and how we relate to non-humans and our objectified environment.

In the same line of thought, Haraway examines how different kinds of social phenomena, such as the difference between masculinity and femininity, between black and white and, in this case, the impact of technology, are transformed into natural phenomena within scientific discourses (Haraway 2006). Haraway demonstrates that the Western classification system is a result of political, ideological interests and historically accumulated dominance and although this classification system is historically inevitable, it is not logically inevitable (Haraway 2006). "All knowledge is a condensed node in an agonistic powerfield", writes Haraway, and "all drawings of inside-outside boundaries in knowledge are theorized as power moves, not moves towards truth" (Haraway 1988, 577). Categories based on race, class and gender are a result of "the terrible historical experience of the contradictory social realities of patriarchy, colonialism, and capitalism" (Haraway 2006, 122). This means that knowledge doesn't spring innocently from the scientist's mind, but rather knowledge is controlled and manipulated by the worldwide techno science industry, which Haraway refers to as the "New World Order, Inc." (Haraway 1997, 57). She argues: "I think the conclusion that the technoscientific agenda for everybody is set by the economically dominant powers, especially the United States, is inescapable" (Haraway 1997, 57). Furthermore, Haraway reveals the political nature of science by showing how drawings of bodily, epistemological boundaries can be extrapolated to political boundaries. Categories have proven convenient tools for assigning and justifying social positions that are associated with certain privileges or disadvantages that have historically resulted in domination, radical exclusion, racism, appropriation, exploitation and even massacre.

Chapter 3. A story about humans in a technologized world

I have argued how the unconscious forces of discourse, desires and power produce social reality as lived social relations of domination. Technological discourse not only constructs how we experience technology in relation to ourselves and how we interact with it, but also how we experience and understand human existence in relation to technology and non-human entities. In the following chapter I will introduce the work of Turkle in order to further explore the technological imaginary. What does her story tell about what is means to be human in a technologized world and what attitude towards human-technology relationships does it cultivate. I intend to expose and deconstruct the existing dichotomies in order to address the divisions and differences they create. I will therefore keep a close eye on the relationships, ordering and categorization that through this discourse appear as 'natural' phenomena. How does this specific technological discourse organize categories such as 'human', 'technology', 'real', 'virtual', and 'natural' and how these conceptual categories have real, political effects. Finally I will explain how Turkle's story becomes part of something bigger by exploring the more popular discourse.

Technology substituting reality

During the past fifteen years, Sherry Turkle has dedicated her professional and personal time to observe humans in a technologized world. Not only, in her own words, as a "psychoanalytically trained psychologist", "anthropologist", "ethnographer" and "clinician" but also as the mother Rebecca, Turkle has told stories in which the relationship between humans and their non-human companions are been drawn (Turkle 2011, x, xiii). Turkle has come to observe how our human existence is interwoven with technologies and sets out to discover what 'they' do to 'us'. According to Turkle our use of technology not only changes our selves and our relationships, but also our sense of being human: "People reflected on who they were in the mirror of the machine xi "; (…) you could see yourself 'differently'" (Turkle 2011 x-xi). In her latest work Turkle argues that through technology, that which was 'authentically' human, has shifted (Tukle 2011)

Starting out with a positive view on the opportunities of virtual worlds for identity exploration and creation in her first book *The Second Self (1984),* Turkle's initial optimism had been put to the test as she was meeting more and more people who found *life on screen* not merely "better than nothing", a substitute, but "better than something" (Turkle 2011, 7). In *Alone Together* (2011), Turkle raises concern about the fact that technology has offered us substitutes "that put the real on the run" (Turkle 2011, 1). Thus her fairytale of the opportunities of virtual worlds full of connectivity and wonderful encounters has turned into a fearful story about how "digital creatures" like Tamagotiches, Furbies, AIBO's, My Real Babies etc. and communication technologies such as Facebook, e-mail and texting, offer an illusion of intimacy while in fact leading us into new solitudes.

The first section of the book deals with technology that imitates living creatures and is dedicated to Turkle's field research on the relationship between people and their robotic companions. It describes how in the "robotic moment", we as humans have passed to "post-biological relationships" as we are emotionally and philosophically ready to consider sociable robots as our companions, caretakers, friends and even romantic partners (Turkle 2011, 61). Turkle is concerned about the ways in which vulnerable

groups such as the elderly and children, are willing to get comfortable with the idea that a robot's companion, despite being in full knowledge of its flaws, is a good replacement for a human being. Robots are delivering where humans have failed and Turkle seems to find evidence of her claim all around us. Ten-year old Callie yearning to find comfort and love in her My Real Baby, which her parents are too busy and distracted to provide. "Disappointed by people, she feels safest in the sanctuary of an as-if world" (Turkle 2011, 79). An elderly man becoming attached to a robot and chatting with it as if it was a little girl: "You sound so good. You are so pretty too. You are so nice. Your name is Minnie right?" (Turkle 2011, 110). Also her twelve-year old daughter Rebecca, disregarding the "intrinsic value of aliveness", when she prefers a robot turtle instead of an imprisoned live one in the American Museum of Natural History in New York. "For what the turtles do, you didn't have to have the live ones", says Rebecca to Turkle's surprise (Turkle 2011, 3). But also those who (should) know better, are vulnerable to the lure of technology. Aaron Edsinger, designer / programmer of the humanlike robot Domo, is willing to believe that a touch of Domo's hand actually expresses care (Turkle 2011, 132). Turkle even finds herself fighting her instinct to react to a life-size human robot called Cog as if it was a human being, fighting for its attention (Turkle 2011, 840). Turkle concludes here that when disappointed in each other, we are so willing to engage with "the inanimate" that we are easily enchanted by what Turkle refers to as "moments of more", which eventually leads us to "lives of less" (Turkle 2011, 154).

In the second part of the book, Turkle finds parallels with our networked lives in which we are comforted to nurture the web, so we can easily pretend it nurtures us. Like robotic companionship, our networked lives draw us to "the comfort of connection without the demands of intimacy" (Turkle 2011, 10). In some way, communication technology is getting in the way of reality. Turkle interviews teenagers who are afraid of using phones but perform in front of an audience of 'friends' on Facebook, creating their digital, second self. Turkle: "It is not unusual for people to feel more comfortable in an unreal place than a real one because they feel that in simulation they show their better and perhaps truer self" (Turkle 2011, 212). Turkle shows how time and again we are choosing mediation over real face-to-face communication, a real voice: 'an incredible instrument … to communicate the range of human emotion? "Why", asks Turkle, "would we deprive ourselves of that?" (Turkle 2011, 207). One anecdote after another, Turkle provides the reader with evidence of how new communication technologies have allowed us to "dial down human contact, to titrate its nature and extent" (Turkle 2011, 15). In the end, Turkle is concerned that the virtual simulation has become more than second best, more alluring than "the physical real" because it provides us with the illusion of intimacy, access and control. All of which, according to Turkle, leads us to expect more from technology and less from each other (Turkle 2011, xii).

What makes human unique?

Turkle enters the contest for creating meaning out of human existence in a technologized world and defines and constructs the self by making clean distinctions with others. *Alone together* thus becomes a story of human identity that relies on limiting boundaries and categorization to include some and exclude others, thereby creating power relations and legitimizing structures of domination in which the human self is granted the privileged, dominant position. By first exposing the dichotomies that shape the human self within this technological discourse, I will then explain how this story can be understood as being part of something bigger.

In her work, Turkle critically explores the new, intimate relationships that exist between humans and the inanimate objects of technology. She notices how hopes, desires and meaning are being projected onto the technologies that we invent and at the same time feels threatened by the many examples of humanlike technology and technologized humans all around us. In claiming to acknowledge the relationship between humans and technology in which they are mutually constructed, Turkle laps into arguments wherein people and technology are radically separated and opposed to each other. Turkle finds it rather disturbing that we seem to treat our fellow humans like machines; while our machines are increasingly being ascribed lifelike characteristics like human intelligence and human emotion. In recognizing that "the boundaries between people and things are shifting", Turkle then asks: "What of these boundaries is worth maintaining?" (Turkle 2011, 135). This question sets the tone for her attitude towards human-technology relationships. Threatened by objects "on the boundaries of life" that cause "category confusions", Turkle feels urged to draw anew the traditional and in her eyes, helpful boundaries and thereby use the reflective power of these evocative technological devices to find out "what makes us uniquely human" (Turkle 2011, 112, 286). Turkle imagines us being specifically human and tries to capture what is unique about our human nature that makes us unlike machines. She argues the limits of artificial intelligence, emotion, and empathy because neither computers nor robots have both knowledge of mortality and an experience of a human life cycle, which, according to Turkle, are essential for humans in order to show empathy and authentic emotion towards each other. Moreover, having a human body is essential for bodily feelings of emotion and therefore mind and body are inseparable (Turkle 2011, 286-287). In the process of discovering the ways in which we are human in comparison to technology, the human self and the technological other are radically separated and opposed to each other. It however becomes clear that this conflict is based on the conceptual dichotomies between the real and the virtual, nature and culture where the opposed terms are supposably mutually exclusive.

Turkle conceives technology as a threat to humanity and is afraid that technology will stand in for the real and substitute humans and their "love's labor" (Turkle 2011, 103). This way of thinking entails a problematic distinction between the 'real' and the 'virtual', privileging the former over the latter. While criticizing the ways in which technology is experienced as "a welcome substitute for the real", Turkle claims that computer mediated communication, communities and relationships are nowhere near the 'real thing'. In the end, virtual spaces offer "cheap alternatives", "a world of weak ties" instead of what Turkle interprets as real community: "real life with real people" (Turkle 2011, 238, 288). This claim will not hold when considering the complex relationship in which the virtual and the real, and thus technologies and humans co-constitute each other. Turkle's arguments are also guilty of the modernistic separation of nature and culture. By considering ourselves as being natural, while technologies are artificial, one experiences the blurring of boundaries between humans and technology as either providing possibilities for the improvement of the human condition or in this case, as violation of our authenticity. The above contraposition refers to the dualistic discussion that Dutch techno-philosopher Peter-Paul Verbeek mentioned in his book *De grens van de mens* (2011) in which we should either embrace these technologies in order to enhance human condition or protect the nature of humans against invasive technologies (Verbeek 2011, 72). Turkle's defensive attitude becomes a popular way to respond to the phenomena of blurring boundaries.

Anthropocentric anxiety: a discursive trend

By exploring the more popular discourse, I signal a widely felt concern for blurring boundaries and changing positions in the light of technological innovation. We seem to be confused about what it means to be human in a technologized world and fear losing what is essentially human in the context of pervasive and intelligent technologies. As Turkle demonstrates, the intertwining of humans and technology therefore raises the anxiety to draw anew the line between humans and technology. While technology is traditionally perceived and used as an instrument for reaching human goals and regarded as an expression of the magnificence of human intelligence, I foresee a discursive trend toward portraying the technological other as a competitor who will take on roles that were traditionally preserved for humans and eventually make humans dispensable.

During the Industrial Revolution, all kinds of technologies were used for replacing human's labour. Factory robots worked quickly and accurately and saved humans the time and effort in getting the job done. Unlike most technology of today, these machines still needed humans in order to operate. Cybernetic machines, such as the simplest thermostat, are no longer controlled by humans but respond to their environment. They are said to reach a form of human intelligence, which allows them to make decisions and act more and more independently of humans. Here people are already starting to feel uneasy about blurring boundaries as machines are gaining human qualities such as intelligence. Robots of the new generation no longer work in factories and machines have become more complex and autonomous than ever before; they have become high-speed information processing machines with great memory capacity, that learn to make intelligent decisions based on past experience and huge amounts of data. Symptoms of life are manifesting themselves into technologies as massive data sets and algorithms are combined to build artificial intelligence. Artificial intelligence is used as an overlapping category that involves technologies such as robotics, control systems, data mining, speech and facial recognition, ambient technologies and many others.

As evolved programs have become more and more effective in accomplishing tasks in ways that humans never could, humans increasingly start to feel that technology will eventually make them dispensable. Dutch philosopher Jos de Mul associated these paradoxical feelings of awe and terror with *the technological sublime.* According to de Mul, technologies provoke a "negative lust" in which attraction and repulsion are synthesized into one experience (de Mul 2011). This means that technologies such as information technology, biotechnology and nanotechnology are Janus-Faced: "They reflect, at once, our hope for the benefits they may bring as well as our fear of their uncontrollable, destructive potentials" (de Mul, 2011). Anthropocentric anxiety has led to representations of technology and specifically robots, as a kind of imposter. "There is a danger", writes Turkle, "that the robots, if at all successful, will replace people" (Turkle 2011, 105).

Uncontrollable technology

This kind of fear for advanced, human-like technology 'taking over' becomes a popular narrative in late and modern science fiction. In the early days it was the threat of the Industrial Revolution that was reflected in popular culture. As early as 1818, *Frankenstein* became a symbol for the fear of creating human-like technologies that will eventually turn against their human makers. In *Metropolis* (1927) and Charlie Chaplin's *Modern Times* (1936) people are reduced to slaves of the industrial machinery, which has turned

them into numbed down creatures that lose their sense of humanity. With the movies *Blade Runner* (1982) and *The Terminator (*1984) technophobia has turned out to be a source of commercial success. *The terminator* predicts a daunting future in which robots take on the battle with humans for the leadership of the earth. In *Blade Runner*, robots are portrayed as human replica's, showing the same level of emotions, strengths and intelligence as humans. These 'replicants' seek their purpose beyond human labour and entertainment and start to take control of their own lives. More recently *The Matrix* trilogy (1999-2003) shows a world in which intelligent robots have conquered the world and use humans as a new energy source.

Intelligent robots are highly anticipated and feared in science fiction movies but according to some, fiction comes close to reality as *the singularity* is near. The singularity marks the moment that through ever-accelerating progress of technology, machines will achieve a greater-than-human super intelligence. In an interview about the book *The Singularity is Near: When Humans Transcend Biology* (2005)*,* the author Raymond Kuzweil explains:

> "Nonbiological intelligence will have access to its own design and will be able to improve itself in an increasingly rapid redesign cycle. We'll get to a point where technical progress will be so fast that unenhanced human intelligence will be unable to follow it. That will mark the Singularity. (…) It will be an era in which the very nature of what it means to be human will be both enriched and challenged, as our species breaks the shackles of its genetic legacy and achieves inconceivable heights of intelligence, material progress, and longevity" (Kurzweil n.d.)

The movie *The Singularity is Near* (2010) describes itself as "a true story about the future". Part fiction, part non-fiction, the movie intertwines a documentary based on Raymond Kurzweil's bestseller with a narrative about a robot on a quest of becoming human. Although Kurzweil's book offers a rather optimistic vision of technological progress and human development in the future, the idea of greater-than-human intelligence is often considered as a threat to humanity. Singularity therefore becomes a popular source of (techno) fear. In 1993 science fiction writer Vernon Vinge predicted that within thirty years, "we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended" (Vinge 1993).

This technological imaginary crosses over from science fiction to other forms of popular discourse, such as blogs. The weblog of Next Nature explores the changing relationship between human, nature and technology. In a much more nuanced way and in a greater and lesser extent, the content on this website seems to reflect the same kind of anxieties as science fiction. Although claiming to understand the co-evolution of nature and (techno) culture, there is the tendency to feel threatened by technological development and describe dystopian scenarios in which humans are at the mercy of uncontrollable technological systems. The aim of this weblog is to reconsider the traditional division and notion of nature and culture in which nature is associated with everything *born* and culture refers to everything *made* (van Mensvoort & Grievink 2011, 12). Concepts of nature and culture shift form a distinction between *born* and *made* to a distinction between *uncontrollable* and controlled. Koert van Mensvoort, who started the blog in 2005, writes how nature, in the sense of animals, trees, or climate, has turned into culture as they become increasingly controlled by humans (van Mensvoort 2005, 4). According to his theory, technological systems can be categorized as nature as they are less and less controlled by humans. Again, the uncertain and uncontrollable character of technology becomes a source of fear:

"Algorithms run the stock market. Computer viruses keep going long after their creators have set them free. Genetically modified organisms thrive in the wild. In this new world of wild, technological beasts, will humans be at the mercy of our monsters?" (Next Nature, 2012)

In the preface of the book Next Nature published in 2011 and containing a collection of the most inspiring contributions to the website, the editors pose the following question: "Will we be able to improve our human condition, or we will be outsourced for good"? (van Mensvoort & Grievink 2011, 2). The dualistic nature of this question reflects the dualistic relationship between humans and technology where the one is out to control the other. Should however, the day come that technology outgrows us and becomes "inaccessible", writes van Mensvoort, we will be forced to "re-cultivate" them, (van Mensvoort 2005, 6). Within this specific discourse we recognize the same anthropocentric and instrumental attitude towards human-technology relationship in which humans are thought to be distinct from, and superior to technology. Although we might recognize changing power dynamics, we aren't ready to surrender to them.

Intimate spaces

In the context of artificial intelligence, I have shown that we have become comfortable using technologies as instruments and recourses for appropriation but start to feel unease when power dynamics and traditional boundaries start to shift as 'they' come too close to 'us'. Technology not only comes close in simulating intelligence, they come even closer by entering our most intimate spaces and growing a familiar face. The Dutch Rathenau Institute that stimulates research and public debate on issues surrounding new media technology, raises awareness around *intimate technologies*, referring to those technologies such as social media, medical self-tests and sociable robots, that invade our private (human) sphere. On October 3rd 2012 researcher Rinie van Est form the Rathenau Institute gave a lecture at the Studium Generale at the university of Utrecht on the topic intimate technology. Van Est predicts a historical turning point; the arrival of the "intieme technologie moment", explicitly referring to what Sherry Turkle calls *the robotic moment* (van Est 2012). According to van Est, the confluence of biology, informatics, cognitive sciences and nanotechnology has resulted in an alarming trend of perceiving people as makeable and assigning human characteristics to technology (van Est 2012). These human characteristics not only refer to intelligence but also human emotion and physical appearance in the context of sociable or humanoid robots. These robots are not only used in various scientific areas such as biomechanics and human cognition, but also as forms of entertainment and personal assistance. For example the robot seal Paro; a therapeutic, interactive robot that is designed as companion and caretaker for the elderly (Figure 2.).

"We ask technology to perform what used to be 'love's labor': taking care of each other", claims Turkle (Turkle 2011, 107). According to Turkle, sociable robots like Paro provide us with simulations of love (Turkle 2011, 10). Science fiction also explores the idea of robots capable of developing human emotions such as friendship and (unconditional) love. The child robot David in Steven Spielberg's *Artificial Intelligence* (2001) is a wonderful replacement for Henry and Monica's sick son and is able to give the kind of unconditional love that only a child can give to its mother. Even when David is abandoned, he is programmed to always love its human mother. In the new Swedish series *Real Humans* that premiered in January of 2012, the wild *hubots* are less obedient to their human creators. Equipped with human

appearance, intelligence, emotions and desires, these robots are ready to substitute humans not only as workers but also as lovers and friends.

Figure 2. Paro the robot seal

Defending the human boundary

Throughout history, humans have built technological models of themseves. Among all technological artefacts, perhaps robots share the most in common with their human makers when it comes to visual appearance. This is perhaps why we are starting to regard technology as 'an other' instead of 'a piece of technology', writes Rick Berends as recapitulation of van Ests lecture (Berends 2012). This feeling increases as humanoid robots are starting to look exactly like humans. Anthropomorphic robots resemble human appearance, either remotely like ASIMO (Figure 3.) or down to the very flesh of the human face (Figure 4.). We imagine that robots want to become human because what else would they want to be? Anthropomorphism and anthropocentrism are two sides of the same coin that structure our human-centered perspective of the world.

Figure 3. ASIMO
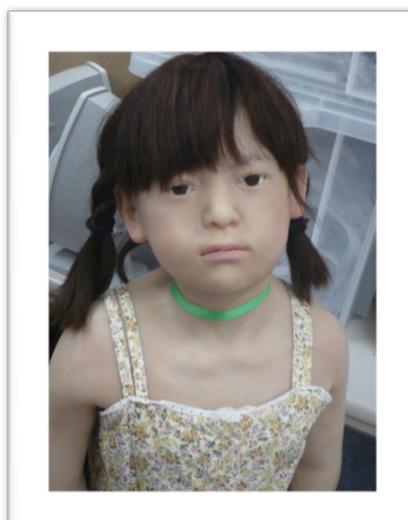
Figure 4. Repliee R-1

Human-like technologies such as the humanoid robot Repliee R-1, can cause feelings of empathy but also feelings of revulsion and unease. This phenomenon is known as *the uncanny valley*, a concept coined by

the Japanese robotic researcher Masahiro Mori (Figure 5.) This theory predicts that as a humanlike robot approaches but fails to resemble human appearance, a person's response to this robot would shift from empathy or affinity, to revulsion (Mori 2012, 98)
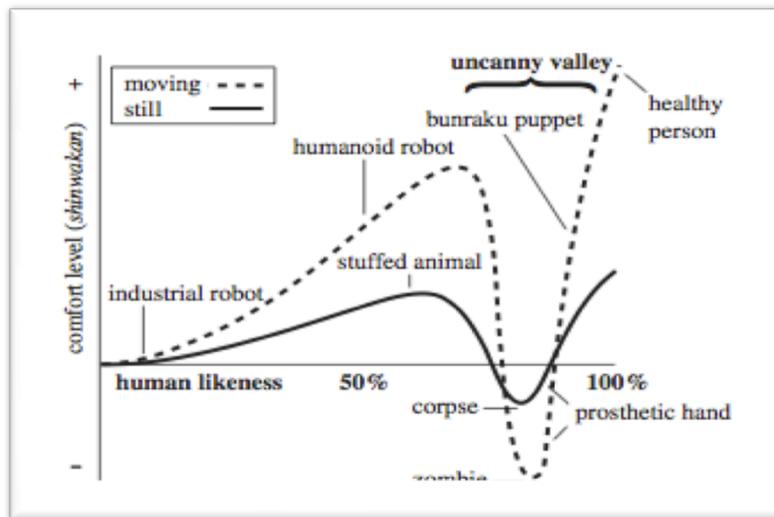

Figure 5. The uncanny valley

Freud also theorized the uncanny, which he connects to "doubts whether an apparently animate being is really alive; or conversely, whether a lifeless object might not be in fact animate" (Freud 1919, 1). Before I elaborate any further on this thought, I would like to point out that this kind of uncertainty causes the anxiety to draw boundaries and seek out guidelines in the context of development and design in order to control these boundaries. As a means to guide technological progress and to ensure the governance of robotics, humans come up with rules as the most common tool for domination. Perhaps the most well-known rules, which have become famous in the world of science (fiction) and cybernetics, are called the *three laws of robotics* that first appeared in the short story *Runaround* (1942) by science fiction author Isaac Asimov:

> *Powell's radio voice was tense in Donovan's ear: "Now, look, let's start with the three fundamental Rules of Robotics — the three rules that are built most deeply into a robot's positronic brain." In the darkness, his gloved fingers ticked off each point.*
> *"We have: One, a robot may not injure a human being, or, through inaction, allow a human being to come to harm."*
> *"Right!"*
> *"Two," continued Powell, "a robot must obey the orders given it by human beings except where such orders would conflict with the First Law."*
> *"Right"*
> *"And three, a robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."* (Asimov 1942, 27)

'Good' robots, like those in *I Robot* (2004), are obedient to their human creators and obey their rules. Science fiction has given us ideas of the types of control and rules we may need with robots entering our lives and homes. "Asimov's laws of robotics were, and remain, a fictional device" says Prof Alan Winfield, expert in the field of robotics. "But if not those particular laws, then in the far future there will have to be

something like Asimov's laws" (Winfield cited in Steward 2012). Based on the belief that the responsibility for robotics should lie with human beings, the Engineering and Physical Sciences Research Council (EPRSC) and the Arts and Humanities Research Council (AHRC) in the United Kingdom have come up with five principles that should guide designers and users of robotics:

1. Robots should not be designed solely or primarily to kill or harm humans.
2. Humans, not robots, are responsible agents. Robots are tools designed to achieve human goals.
3. Robots should be designed in ways that assure their safety and security.
4. Robots are artefacts; they should not be designed to exploit vulnerable users by evoking an emotional response or dependency.
5. It should always be possible to tell a robot from a human.

(EPRSC 2011)

According to the EPSRC, these rules are not intended as hard laws, but rather to stimulate discussions about issues of responsibility and authority when designing and using robots (EPRSC n.d.). Still these principles reflect the common assumption that humans and technology are in conflict. Boundaries are human constructions for staying in control and when we start to feel like these boundaries are being crossed, we fear our own position with regard to those objects we manipulate. In recognizing and perhaps even sharing this concern, the Rathenau institute organized a competition in July 2011 in collaboration with Dutch daily newspaper NRC Next, in which people were asked to design their own intimate technology: "Hoe ziet de techniek van de toekomst eruit, die naar jouw smaak akelig dichtbij komt? Wat is de app die jouw grenzen overschrijdt? Van welke techniek wordt je ongemakelijk?" (Rathenau Instituut, n.d.). As inspiration for their readers, the NRC Next identified several boundaries that people might experience in interaction with (intimate) technologies:

• Techniek mag ons niet beter kennen dat wijzelf.
• Een mens is verantwoordelijk voor keuzes, niet een computer.
• Je mag niet 'menselijkheid' uitbesteden aan techniek.
• Technologie mag niet van ons maken wat we niet zijn.
• Nieuwe technieken maken ons dommer.

(Houtekamer, 2011)

Inspired by several of these boundaries, the winning design was a mind-reading app that can interpret facial expressions from a photograph taken by a mobile phone (Figure 6.).

Before the boundary between humans and technology fades away, Turkle believes that we need to put technology back in its place. "That turns out to be very complicated", explains Turkle in an interview with Frontline:

"You can't put something in its place unless you really have a set of values that you're working from. Do we want children to have social skills, to be able to just look at each other face to face and negotiate and have a conversation and be comfortable in groups? (…) Well, if so, a little less Net time, s'il vous plait" (Turkle 2009)

Van Est also suggests we seek out and be guided by moral principles and values in consideration wether or not we even should use technologies in particular situations. Like diversity has value for ecological sustainability, van Est believes that there are values we should strive for with regard to human sustainability. We should only use technologies where they offer great opportunities for mankind, such as overcoming the fear of flying with the help of virtual flight simulation (van Est 2012). This means that technology is only considered valuable when serving some form of human purpose (Turkle 2011, 19).

Figure 6. Winning design 'intimate' technology

Chapter 4. Co-constitution of humans and technology

The technological imagination that I have explored is based on many assumptions about what it means to be human in a technologized world and urges people to feel and create boundaries in which humans and technologies fall into separate categories of existence. These boundaries, fixed positions and limits should be exposed for what they really are: constructions and effects of unconscious forces and not of nature. In the light of these forces, we can begin to explore our defensive attitude and anxieties towards technology in relation to humans.

The exclusive human category

By reducing the world into binary oppositions, one creates a false sense of unity. Boundaries give people the illusion of a stable reality in which humans have fixed identities and everything is ordered within neat categories of distinction, which I have explained before are far from innocent. The construction of dichotomies and boundaries both call on and reflect the desire of unity, stability and wholeness, which finds it origin in Western history. In this way, the technological narrative becomes part of the dominant narrative of our time; the Western philosophy of man and history based on the logocentric system of thought and the dichotomous structure on which it relies (Grosz 1989, 31). This story teaches us to desire that which we ultimately lack: an immediate and fixed experience and expression of ourselves and of our world. We strive to obtain a fixed identity as a being separate from other beings as a result of the Western demand for a stable identity. Through the process of identification and internalization, the human subject finds it identity reflected in the other, which in this case is the technological other.

Haraway critiques the Western tradition of reproducing the self from the reflections of others, not only because it leads to "self knowledge of a self-who-is-not" but more importantly, because of the dualistic differences and power relations that are produced between the self and all that are marked as 'other' (Haraway 2006, 126). The technological discourse as part of Western science and politics, sustains the logics and practices of domination of the other, "whose task is to mirror the self" (Haraway 2006, 143).

> "The self is the One who is not dominated, who knows that by the service of the other, the other is the one who holds the future, who knows that by the experience of domination, which gives the lie to the autonomy of the self. To be One is to be autonomous, to be powerful, to be God; but to be One is to be an illusion, and so to be involved in a dialectic of apocalypse with the other. Yet to be other is to be multiple, without clear boundary, frayed, insubstantial. One is too few, but two are too many" (Haraway 2006, 143)

It is however the (hu)man in Western sense, that is, "an ultimate self unified at last from all dependency, a man in space", who has invented these categories of and distinctions between the self and the other (Haraway 2006, 123). When we make a distinction, we always mark a positive (dominant) side and a negative (dominated) side. The human is granted, or rather, grants itself the dominant position of the self who decides which side of the distinction it occupies. In deciding what is unique about humans, Turkle for example directly decides who or what falls outside this category of distinction. This notion of the self

transforms women, blacks, nature and technology into the other: the non-human. This also means that dichotomies such as nature/culture, man/woman, white/black and human/non-human are simply a subset of the broader dichotomy between the self/other.

The exceptional role of humans as distinction makers is linked to enlightenment notions and intertwinement of reason, truth and knowledge that seem to structure and legitimate Western philosophy and science since the 18th century (Flax 1990, 7). This story assumes true and neutral knowledge as representing something 'real' that exists independent of the scientist and is grounded in universal reason as opposed to particular (political) interests and stakes. Most Western philosophers appoint themselves the role of self-conscious, neutral judge that has a privileged position of judging truth claims and revealing some form of absolute or final truth through science that makes further research unnecessary (Flax 1990, 12). To perceive oneself as a "heroic lawgiver, foundation builder" (…) "places the philosopher outside of a time in which un-self-reflective certainty seems more like a will to power, than a claim to truth" (Flax 1990, 12). Turkle takes on this exclusive role in assuming that she alone can tell the real (flesh and blood) encounters from the fake (technological mediated) encounters. She sees it as her place to "put technology back in its place"; there where it can serve our "human purpose" (Turkle 2011, 19-20). From an all-seeing position, Turkle assigns humans and technology fixed and separate positions in the social hierarchy of the world. This slightly reminds us of what haraway calls the "god trick": to see everything from nowhere (Haraway 1988, 581).

I conclude that this technological discourse as part of the Western system of myth and meanings produces relationships and ordering based upon arbitrary categories of differences, which are perceived as natural, undisputable and innocent. Techno science fabricates stories that tell who or what we are within the existing hierarchal power structure of Western culture in which technology falls in the same category as the artificial, non-human and objects, which are dominated by nature, humans and subjects.

The uncanny: when the familiar becomes unfamiliar

This system categorization and domination could explain why we feel uneasy about human-like and intimate technologies. What is most disturbing about these objects that lie on the boundary of human and non-human, is that they challenge this very distinction. Technologies and especially anthropomorphic technologies cause the fear of recognizing human characteristics in non-human objects, also called anthropomorphobia. According to van Mensvoort, its symptoms are "irrational panic attacks, disdain, revulsion, and confusion over things that change what it means to be human" such as robots, plastic surgery and intelligent animals (van Mensvoort 2011).

We now return to Freud's theory of *the uncanny*, which he also describes as the familiar becoming increasingly unfamiliar, or "that in which one does not know where one is, as it were" (Freud 1919, 2). In the psychoanalytic understanding of human beings being determined by unconscious processes, Freud interprets the uncanny in terms of repressed material in the unconscious that reoccurs as a source of anxiety. The uncanny is not something new or foreign, but rather strangely familiar to the mind, that has become strange only by the force of repression (Freud 1919, 13). In other words, the uncanny is the return of the repressed. This conclusion further explains the German philosopher Friedrich Wilhelm Joseph Schelling's definition of the uncanny as that which "ought to have remained ... secret and hidden but has come to light'" (Schelling cited in Freud 1919, 224)

What 'secret' is revealed through technology that causes an uncanny discomfort to arise? Haraway claims that through our new relationships with technology, we suddenly become aware of the fact that we might not be so distinct from and superior to technology as we initially thought. As technologies are built to imitate and augment human appearance and abilities, a kind of duplicating takes place that, according to Botting, threatens human uniqueness and reveals their "mechanical side" (Botting 2005, 17). People are afraid of the questions raised by the blurring boundaries between humans and technology. 'Aren't we all just machines'? And: 'What is still special about being a human'? What once was familiar (human identity) now becomes increasingly unfamiliar in our technologized world. In a world where clear distinctions are breaking down and where no creature is simply human, "human status" becomes "highly problematic" (Haraway 2006, 145). According to Haraway, the question today is whether human and machine can at all be regarded as ontologically distinct. We are and have always been *cyborgs*: hybrids of human and machine, nature and culture, reality and fiction (Haraway 2006). This notion thoroughly changes our perspective and attitude towards human-technology relationships:

> "The machine is not an it to be animated, worshipped, and dominated. The machine is us, our processes, an aspect of our embodiment. We can be responsible for machines; they do not dominate or threaten us. We are responsible for boundaries; we are they" (Haraway 2006, 146)

It becomes clear that Turkle and Haraway take a whole different attitude when confronted with category confusions caused by new human-technology relationships. Turkle amongst others feels threatened because our traditional understanding of the human subject is challenged. In protecting the traditional Western boundaries, she simultaneously sustains the power relations that arise from them. Haraway on the other hand, encourages the confusion of boundaries because it creates room for revaluating the dominant ideas of what it means to be human and what it means to be alive. It allows us to break with and take responsibility for limiting boundaries that underlie fixed subject and object positions that have long legitimized power relations in Western history. Moreover, Haraway challenges settled politics that assume that binary oppositions are natural distinctions instead of cultural constructions and than claims that there are no pre-existing subjects and objects. Technology and humans, like cyborgs, are the "products of their relating" and can therefore never be regarded as pre-existing, separate and / or opposite (Haraway 2003, 7).

Cyborg writing

Haraway encourages others to find the tools to describe new experiences that have "serious potential for changing the rules of the game" (Haraway 2006, 139). In order to resist the dominant myth of Western culture, one must become a writer to enter the contest for meaning. "Cyborg writing is about the power to survive, not on the basis of original innocence, but on the basis of seizing the tools to mark the world that marked them as other" (Haraway 2006, 141). This means that people should (re)tell stories about themselves their bodies and their histories, to undermine dominant stories such as for example, the founding myth of original wholeness (Haraway 2006, 141). Haraway aimed at creating a language where one could talk and think about the world beyond rigid boundaries that (re)produce structures of power and subordination. In acknowledging that the categories and concepts by and through which we shape

experience are culturally and historically situated, Haraway introduces the concept of the cyborg that represents the construction of identity that is revealed in our technologized world. The image of the cyborg as a political identity undermines the traditional dualistic framework, in which we have explained ourselves and others and which, according to Haraway, underlies the logic of any domination. In our current high-tech culture most of the dominant dichotomies are no longer sustainable:

> "Late 20th-century machines have made thoroughly ambiguous the difference between natural and artificial, mind and body, self-developing and externally designed, and many other distinctions that used to apply to organisms and machines. Our machines are disturbingly lively, and we ourselves frighteningly inert" (Haraway 2006, 120)

Opposed to the 'natural' identity, Haraway suggest the cyborg identity as "a kind of post-modernist identity out of otherness, difference, and specificity" (Haraway 2006, 123). The multiple and fragmented cyborg cannot be pinned down to any fixed category of identity because unlike the traditional 'Western identity', it doesn't seek out an essential unity. The idea of essential unity is an illusion because the self is in constant interaction with the other (Haraway 2006, 141). A cyborg perversely forms temporary, illegitimate relationships with everything and anything. These connections are not based on natural identification but rather on "conscious coalition, of affinity, of political kinship" (Haraway 2006, 123). "Cyborg unities are monstrous and illegitimate", writes Haraway. And "in our present political circumstances, we could hardly hope for more potent myths for resistance and recoupling" (Haraway 2006, 122).

In a moment of reflection, Haraway reminds us that the cyborg is far from innocent. In freeing itself from natural boundaries, the cyborg not only becomes a desirable configuration of subjectivity, but also a potential threat as it suspiciously refers to the Western ideal of the whole, independent and autonomous individual.

> "From one perspective, a cyborg world is about the final imposition of a grid of control on the planet, about the final abstraction embodied in a Star Wars apocalypse waged in the name of defense, about the final appropriation of women's bodies in a masculinist orgy of war (Sofia, 1984). From another perspective, a cyborg world might be about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory stand- points" (Haraway 2006, 122)

The future of the cyborg isn't written yet, but Haraway has already created her version. Instead of logical arguments, one must use evocative images to convince its readers. Where cyborg imagery suggest a social reality in which we relate in *significant otherness*, Turkle imagines a world of differences in which humans seem to dominate all forms of companionship.

Technology *is* the human condition

Turkle imagines a world where the other is regarded as merely the reflection of one's intention and where the purpose of any relating is self-satisfaction, instead of interest for the other as an independently existing being or apprehension of things as they are in themselves. This becomes very clear in the context of

sociable robots. These technological others are considered valuable only as surrogate humans to enable the illusion of reciprocal love, or as objects to serve our human purpose (identification, profits and resources). Interpreting human-technology relationships exclusively in terms of human values and from a human perspective sustains the technological relating to the world, and the purely instrumental way we consider and deal with others.

Inspired by Martin Heidegger, one of the most influential philosophers of the twentieth century, Dutch socio-philosopher Aweé Prins argues that our modern technological age is one of a peculiar enchantment by the seemingly infinite manipulability of our world and of ourselves (Prins 2007, 255-276). Prins interprets human existence in the context of *Dasein,* a fundamental concept of Heidegger's philosophical quest of what it means to *be*. Prins states:

> "(…) de mens is niet een object in de wereld, hij bevindt zich niet als water in een glas, de mens existeert: het menselijk bestaan voltrekt zich in en als een intentionele gerichtheid op de wereld, de anderen en zichzelf; een gerichtheid, die zich bovendien in termen van 'bewustzijn' niet uitputtend laat beschrijven" (Prins 2007, 151)

Our intentional focus on the world offers a limited perspective of the world; an anthropocentric perspective which strongly influences the way we interpret ourselves in relation to others. From an anthropocentric point of view, humans have greater intrinsic value than any other species in the world. To be human is to be special and different. By placing the human at the center of a world of objects and granting the human subject the dominant position of any dichotomy, we fail to understand the world from a non-human perspective and don't recognize non-humans as active actors in the constitution and evolution of the world and of humans. Haraway suggests that we need to pay attention to the multiple ways in which human and technology have shaped each other. Social reality should be about "relating in significant otherness, through which the partners come to be who we are in flesh and sign" (Haraway 2003, 25). In the same line of though, Verbeek argues that technology *is* the human condition instead of threatening it.

> "Zonder het vuur, het schrift, de bril, het vliegtuig en de telefoon zouden wij niet de mensen zijn die we nu zijn. Sterker nog: doordat we technieken zijn gaan ontwikkelen en gebruiken, hebben we de richting van onze eigen evolutie beïnvloed. De mens is een technisch wezen" Verbeek 2011, 28)

We need to regard others as our companions instead of our opponents or merely reflections of our selves. In this egalitarianism it is not about having the same rights but respecting and recognizing each other differences beyond fixed categories and not only living, but also becoming together.

In our world of inter-species relations, the cyborg is just a "junior sibling". In her more recent work, Haraway comes to see dogs as the most significant example of companion species. Within science stories and feminist theory the cyborg serves as a critical object to think with. Dogs on the other hand, are literally here to live with, which makes them a livelier example of companion species that bring together nature and culture (naturecultures) in many ways. Moreover, dogs are no projection of our intention; they are dogs, our companion species. Haraway takes dog/human relationships to illustrate how history matters in historically specific relationships, or "joint lives" of humans and their companions. We are bound in significant otherness; we co-constitute each other to become who we are, in story and flesh, but are "significantly

other to each other" (Haraway 2003, 3).

　　Our view on the evolution of humans and dogs are influenced by dominant stories of biological reductionism and / or cultural determinism. These are hierarchical stories of domestication in which the man appropriated the wolf and made him a submissive and servant dog. According to Haraway, these stories overlook the reciprocal interaction of many actors in what Haraway calls "a successful evolutionary strategy", which benefited humans and dogs alike (Haraway 2003, 30). With the idea that stories are stronger than ideologies, she hopes that human-dog stories will lead to a better understanding of the co-constitution of subjects and objects in and through their differences.

> "The recognition that one cannot *know* the other or the self. But must ask in respect for all time who and what are emerging in relationship, is the key. That is so for all true lovers, of whatever species" (Haraway 2003, 50)

The goal in exploring how companion species are historically linked to humans on a social, biological and behavioural level is to introduce new ways of thinking about relationships in terms of co-evolution and co-constitution. This insight leads to an understanding of humans as products of a dynamic network of technologies and animals.

Chapter 5. Conclusion: the future isn't written yet

Parts of a co-constructed whole

All the arguments I have presented within this thesis are based on the idea that reality is discursively constructed and that discourse forms the objects of which it speaks. I thereby argue against an objective, autonomous truth that can be discovered through science and explained how dominant accounts of reality or 'the truth' are produced by dominant stories that produce collective imaginary. The collective imaginary gives rise to socially constructed, historical patterns of assumptions, values, beliefs and concepts from which actors extract their very existence, organize themselves and others and give meaning to reality. This means that things considered natural, fixed and / or pre-determined, like human identity and the human body, are actually constructed by our ideas about them. This insight has led me to analyse identity as a construct of the collective imaginary and the accompanying unconscious forces of identification, signification and imagination.

Because frightful stories of humans in a technologized world remain a popular way of organizing humans and technology into a meaningful context, I conclude that the technological imaginary becomes an important part of the discursive formation of the human self. Parallel to the opportunities and benefits to be gained from technology, exists the unease about an increasingly technological world that alienates us from some original state of humanness. This anthropocentric anxiety regarding the threat that technology poses to human nature is echoed by Turkle and becomes a popular way of understanding humans in a technologized world. From science to fiction, the human/technology dichotomy not only separates humans and technologies into different and isolated categories of existence, but also gives rise to a certain logic of dominance that turns technology into the non-human other to be dominated, exploited and appropriated by the human-self.

Theories of psychoanalysis and of imaginary and symbolic identification have proven useful for understanding the unconscious processes leading to the dualistic relationship between humans and technology. Although some of these theories might be considered obsolete, I have shown how they remain relevant in revealing and understanding the power of unconscious forces that are invisible or repressed but nonetheless have formative effects. These theories have enabled me to analyse technology as mirror through which we identify with and internalise images of the technological other in order to create an imaginary sense of a complete, fixed and unified self. I argue that the construction of dichotomies and boundaries within the technological discourse both call on and reflect the desire of unity, stability and wholeness and the fear of losing it. Furthermore, Freud's theory of *the uncanny* has provided insight into the unconscious source of anxiety, caused by human-like or 'intimate' technologies.

Through theories of subjectivity and power I have demonstrated that self-concepts aren't one-dimensional or isolated, but embedded within conceptual frameworks in which they exist in relation or binary opposition to other concepts. What I would like to emphasize in this last chapter is that conceptual frameworks aren't limited to the mind or the mental region. Despite connotations of being unreal and / or imaginary, one shouldn't fail to consider the material, bodily and political effects of the collective imaginary. In chapter two I have argued that the technological discourse is embedded within the dominant Western system of thought and language that organizes the experience of reality through the logic of binary

oppositions including self/other, nature/culture, subject/object, human/non-human and identity/difference. In everyday live, these dichotomies continue to create power relations that result in inclusion, exclusion, appropriation and exploitation. When the conceptual boundaries that are created by the dichotomies are considered natural boundaries and one version of reality becomes a common view of the world, a successful hegemony has been established. Boundaries define, describe and classify things within discourse. Therefore, words can be perceived powerful tools for categorization that commonly result in dominant and marginal (social) positions and status.

This has proven to be a good explanation as to why some people experience anxiety towards invading, (human-like) technologies, which in general motivates them to hold on to and defend traditional concepts of the self and the technological other as polar opposites and universal categories. While technology is part of humans and vice versa, the Western man sees itself as distinct from it, standing outside if not above the rest of the non-human world. When humans recognize themselves in the mirror of technology, an uncanny feeling might occur. The uncanny is considered frightening because it is strangely familiar to the mind, yet has been repressed and now recurs as a source of anxiety. Inanimate, humanlike technologies remind us of the technological nature of human beings and challenge the distinction between human and non-human. The concept of human identity has become unfamiliar and one can feel confused about what is means to be human. When the mechanical side of humans is revealed through advanced technologies that imitate human life, the exceptional and exclusive human status becomes problematic. The human in Western sense, that is the autonomous, self-unified 'man in space', will experience the blurring boundary between humans and technology as a violation of its dominant position as distinction maker and not as the human condition. As demonstrated by Turkle, this defensive attitude has become a common and popular reaction to the anxiety and uncertainty caused by blurring boundaries and category confusions.

I like to assume that there are multiple understandings of human-technology relationship that don't rely on limiting boundaries and universal categories. In the tradition of deconstruction, the aim of this research has been to reverse the human/technology dichotomy by showing that this hierarchical relation is not logically necessary, natural or unalterable and by placing the dominated term within the core of the dominant term, as it logical condition. I argue that humans and technology are not to be categorically opposed as the human self and the technological other, but rather regarded as parts of a co-constructed whole. To substantiate this argument, I have explored the tension between the popular dichotomy of humans and technology and the technological understanding of human existence in chapter three. My intention was to illustrate how technology is and always has been in a dynamic, interactive and complex relationship with humans. In this attempt I have been inspired by Haraway's ideas of co-constitution and companion species. The main idea here is that humans and their companions aren't separate from each other but can only be understood in their mutual relationship. Man and technology constitute each other and they are what they are in relation to one another. This insight further challenges the Western, anthropocentric understanding of human autonomy and exceptionalism that is reflected and constructed in the technological imaginary. We have never been authentically human or autonomous regarding our technological environment. Because humans and their technological environment are fundamentally intertwined, it seems useless to act as neutral guard who determines how far technology can enter into the human sphere. There is no such place outside of technology. We are all technological beings; technology becomes us and we become technology.

Spreading confusion

Unlike Turkle, Haraway's stories undermine modern dualistic thinking and universalisms that produce traditional forms of subjectivity and objectivity. Her point of view provides a more productive and sensible basis for approaching human-technology relationships, not in terms of hierarchical differences based on natural, predetermined values but in terms of their significant otherness. With her stories and evocative images, Haraway offers a way to think differently about what it means to be human in a technologized world. It is a matter of a different perspective on yourself, your situatedness in this world and this time (van den Boomen, 1994).

Like Haraway, there are many other philosophers who oppose the modern thinking in dichotomies and who provide new vocabulary, and / or new insights for the analysis of the interaction between humans and technology. For example, Bruno Latour and the Actor-network theory that suggests describing reality by describing how the power in a network is established by looking at the effects as a result of the interaction between both human and nonhuman actors (Latour 2005). Instead of focussing on *parts*, Latour suggest gaining insight into *the whole*; the networks in which man and technology (hybrids) are located together. The ANT provides a useful new framework of thinking in relational terms, in order to break with self-interest that accompanies an instrumental, anthropocentric point of view. Important to note here is that actors are not valued on an ontological basis; non-human actors can also 'act' within a network. Another example is Peter-Paul Verbeek's research into the blurring boundaries between humans and technology in which he defines new frameworks that could serve as guidelines for the social-ethical discussion that is associated with this phenomenon (Verbeek 2011).

These examples prove that there are more fruitful positions than just technophobia or technophilia Although frightful and hopeful stories about the future of humans in a technologized world will always be part of the collective technological imaginary, it is always important to challenge dominant stories in order to undermine power structures and gain a more diverse and comprehensive perspective of the world and of ourselves. The point is that anyone can tell a story; only when that story produces meanings that others can find meaningful, does it have the potential to become what Haraway calls "a world changing fiction" (Haraway 2006, 117). The future isn't written yet and by creating different versions, we might push the boundaries of our understanding and spread confusion about what is means to be human.

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