Media literacy is often focused on evaluating the message rather than reflecting on the medium. Bringing together postphenomenology, media ecology, posthumanism, and complexity theory, Richard Lewis offers a method for such a reflection and shows how our everyday media environments constitute us as (post)human subjects, always in a state of becoming. An original interdisciplinary effort and a must-read for everyone interested in how we become with and through technologies.

Prof. Mark Coeckelbergh, University of Vienna

We are mediated by and immersed in a world where information and communication technologies (ICTs) are undergoing accelerated innovation. From hardware like smartphones, smartwatches, and home assistants to software like Facebook, Instagram, Twitter, and Snapchat, our lives have become inextricably entwined with a complex, interconnected network of relations. Scholarship on media literacy has tended to focus on developing the skills to access, analyze, evaluate, and create media messages without considering or weighing the impact of the technological medium and the broader context.

What does it mean to be media literate in today’s world? How are we transformed by the many media infrastructures around us?

These issues are addressed through the creation of a transdisciplinary approach that allows for both practical and theoretical analyses of media investigations. The author proposes a framework and a pragmatic instrument for understanding the multiplicity of relations that all contribute to how we affect—and are affected by—our relations with media technology. The increased awareness provided by this posthuman approach affords us a greater chance for reclaiming some of our agency by providing a sound foundation upon which we can then judge our media relations.

This is the author-approved edition of this Open Access title. As with all Open Book publications, this entire book is available to read for free on the publisher’s website. Printed and digital editions, together with supplementary digital material, can also be found at http://www.openbookpublishers.com.

Cover image: Albert György, Mélancolie (2012). Photo by Marieke S. Lewis (2019), CC-NC-ND. Cover Design by Anna Gaëlle.
4. The Posthuman

Situating the Subject in Human-Tech Relations

I take the posthuman predicament as an opportunity to empower the pursuit of alternative schemes of thought, knowledge and self-representation. The posthuman condition urges us to think critically and creatively about who and what we are actually in the process of becoming. (Braidotti, 2013: 12)

After focusing on the technological relations in the previous chapter, I now bring the discussion to the human side of the human-technology relation, trying to better understand what makes up the human subject under discussion. I first give a brief historical account of the humanist subject, consider the transhumanist subject, and discuss how they each are involved with the human enhancement debate. I then make the case for a philosophical posthuman subject that is complex and emergent. Through a contemporary approach to the human, I use complexity to understand our selves not as standalone individuals but as complex and interrelational beings who are always becoming through the relations in our lives. This chapter will finalize the background and theoretical underpinnings for the framework developed in Chapter 5.

It is difficult, if not impossible, to fully comprehend the effect of information and communication technologies (ICTs) without first having an accurate understanding of the human subject. While we have made great advances in developing technologies, it is surprising...
how challenging it remains to answer the question, *what are we?* While it may be simple to ask the question, contriving an answer is much more complicated. Finding the answer to this question has been one of the primary concerns of philosophers (and humankind) throughout recorded history.

In order to understand how the technological relation discussed in chapter three constitutes us, it is helpful to understand what is this ‘us’ we are talking about. While understanding the human subject has changed throughout history, it is further complicated by the wide range of cultures with radically different ways of interpreting the human. My main focus remains on the contemporary, Westernized world. This is not to discount other cultures that have beneficial contributions and perspectives, but simply to limit the scope and stay embedded within my own situated knowledge so as to avoid ‘appropriating the vision of the less powerful while claiming to see from their positions’ (Haraway, 1988: 584).

**Humanists and Transhumanists Debating Enhancement**

As ICTs encroach more and more into our lives, questions of the convergence of humans and technology are raised. The majority of people in the developed world now have a constant connection with the digital world through smartphones—roughly 72%—and the undeveloped world has reached almost half who have a constant connection (Poushter et al., 2018: 4). This connection provides instant information retrieval via a browser search (often Google) and an ever-present network of friends via social media. At one’s fingertips are answers to almost any question, from restaurant reviews, to directions, to definitions. Translation apps can use augmented reality by using the phone’s camera to change an image’s words into one’s preferred language (Fragoso et al., 2011). Wearable technology is taking advantage of being located on one’s body and provides a person with health-related information and insights (Van Den Eede, 2015b). Technologies are indeed ‘moving towards us, into us’ (Van Den Eede, 2017: xxv).

Recent advances in nano, biological, and information technologies, along with cognitive sciences (collectively referred to as NBIC
technologies), have sparked a passionate ‘human enhancement’ debate concerning what it means to be human (Roco & Bainbridge, 2003). On one side are transhumanists, who cite our long history of using technology to survive and improve our lives; from fire, to shelter, to cross-breeding plants for better agricultural yields. In the transhumanist view, gene splicing and nano technologies are simply next steps in this long history. On the other side of the spectrum are the bioconservatives, or traditional humanists, who believe that human enhancement can lead to the potential loss of something essentially human.

First, there is no one humanism or one transhumanism. Both have evolved over time, and both are comprised of many people with differing opinions. My ultimate goal is not to disprove either of these approaches, but to create a contemporary understanding of the human subject in order to more fully realize how relations with technologies contribute towards constituting the human subject. I attempt to limit making sweeping statements. I also restrain from spending too much time defining myself against other approaches, saving the bulk of my argument for an *affirmative* building of my position.

**Convergence of Humans and Technologies**

As ICTs come ever more entangled with our lives, one question might be raised concerning how much longer it will be before we move from wearable to widespread *embedded* technology? This brings about the question of NBIC technologies and human-technology convergence. Already there are advances to neural interfaces, where the goal is to ‘seamlessly integrate the interface between neurobiology and engineered technology to record from and modulate neurons’ (Wellman et al., 2018: 1; cf. Neely et al., 2018). Brain-to-machine interfaces are being developed for assistive technologies (Donati et al., 2016) but also more generally for ‘interaction between a person and a machine via thought’ (Sargent et al., 2017: 1). There are now even brain-to-brain interfaces being developed (Zhang et al., 2019).

In addition to this convergence between humans and technological artifacts, the door is now open to inexpensive manipulation of the human genetic code; for example, through CRISPR-Cas9 process (Doudna & Sternberg, 2017; Ran et al., 2013), which makes it relatively easy and
inexpensive to cut out unwanted genes and replace them with different genes, even genes from non-humans. Technologies and humans are converging on many different fronts. Possibilities that a few years ago seemed like science fiction appear to have credible potential in the near future. The situation has caused a polarized debate concerning human enhancement. On one side of the debate are the exciting possibilities of eradicating chronic diseases and improving the quality and longevity of human lives. On the other side, there are concerns over losing something essentially *human* (Fukuyama, 2004) through the convergence with technology.

There is also concern over equity and the increasing division between the haves and have-nots. It is possible that the more affluent will be able to give their children improvements with enhanced minds and bodies while the less affluent remain ‘behind’. This could even lead to some humans becoming so enhanced that they become *post*-humans, taking an evolutionary step beyond what we consider as *Homo sapiens*. This situation highlights the need to address how we define ‘human’ in relation to converging technologies. We now are starting to possess the technological ability to be able to play a more active role in the evolution of humanity, causing some to question our ability to understand the long- and short-term ramifications of playing the role of *Homo deus* (Harari, 2016). This leads to questions like: What is the most helpful approach to understanding the convergence of technology and the human? How can the human be separate from technology at the same time it is converging with it? Is there a more relevant representation of the human individual than the centuries old humanist ideal as captured by Da Vinci’s *Vitruvian Man*?

Humanism and the Enlightenment: An Old Foundation

Today, the humanist mantel is interpreted differently by bioconservatives (or conservative humanists) on one side (e.g., Fukuyama, 2002, 2004; Habermas, 2003; McKibben, 2004) and transhumanists on the other (e.g., Bostrom, 2005, 2013; Kurzweil, 2005; Moravec, 1988; More, 2013). However, both sides of the debate have foundations in humanism and the Enlightenment. Because the foundation of the human enhancement
debate rests on rational humanism and the Enlightenment, I begin with an overview.

As Sharon (2014) points out, both bioconservatives and transhumanists are founded upon humanist ideals. The rational humanist subject, stemming from the seventeenth and eighteenth centuries and closely connected to the Enlightenment, is an empowered subject, able to think for itself and not necessarily depend upon religion for answers. Rationalism and the age of reason led European society (and beyond) toward great advances, including the industrial revolution. The autonomous individual became the norm. Beatrice Han-Pile (2010) states that in the English-speaking world humanism is:

often associated with an optimistic and secular view of the world which asserts the privilege of human beings over non-organic (or organic but nonhuman) entities, defending the rights of human beings to happiness and to the development of their individual potential (118).

Humanism helped move humanity out of the ‘Dark Ages’ and into an age of reason and control, elevating and empowering the human individual. While humanism and modernism have contributed to reducing famine, plagues, and deaths due to wars (Harari, 2016), it has also led to humanity consuming the Earth’s resources at an alarming rate. This has contributed to bringing us into the sixth mass extinction (Cafaro, 2015) at the same time as the fourth industrial (technological) revolution (Schwab, 2017).

Humanism was not always so singularly (and narrowly) defined (Braidotti, 2013; Han-Pile, 2010; Hayles, 2008; and additionally, Hughes, 2010a). However, with the backlash against positivism and the outcry from the French poststructuralists and postmodernists, humanism has been shaped into a discipline that has lost some of its previous diversity and is now seen in a more singular manner; as valuing the rational, autonomous, and exceptional self, where the natural world is a Heideggerian (1977) reserve of resources available for our use and

1 Humanism’s merger with capitalism has teamed up to provide us with an industrialized and global economy that churns out profits and supplies us with a seemingly unlimited number of gadgets. While we have never been so entertained, with access to so much fantastical variety of fetishes, fantasies, and spectacle, the question remains: at what price and what happened to the promised enlightenment?

2 In relation to divisions within the Enlightenment.
exploitation. And yet, the embrace of ‘the human’ obscures those who remain un-embraced; marginalized groups who are too slowly being accepted as equal or even included, and who are still far from counting as fully human in the eyes of too many (Latour, 1993). As Braidotti (2013: 1) points out,

> Not all of us can say, with any degree of certainty, that we have always been human, or that we are only that. Some of us are not even considered fully human now, let alone at previous moments of Western social, political and scientific history. Not if by ‘human’ we mean that creature familiar to us from the Enlightenment [...] And yet the term enjoys widespread consensus and it maintains the re-assuring familiarity of common sense. We assert our attachment to the species as if it were a matter of fact, a given. So much so that we construct a fundamental notion of Rights around the Human. But is it so?

A very troubling aspect of humanism is the shift toward eugenics and the genocide of Jews, LGBTQs, people with abilities that were perceived outside of a socially-constructed norm, and various marginalized groups in the name of perfecting the human ‘race’. Even now, women are not paid a wage equal to men in nearly all places around the globe, LGBTQ rights are not accepted worldwide, and racism continues to be widespread. While the humanist concept of the human has helped some become empowered, it has left other humans outside of what is accepted, or desired. Another part of the criticism of humanists is that they adopt an anthropocentric perspective, considering the human as exceptional and placing people above any other species in the world.

**Transhumanism: Reasonable or Extreme?**

Rather than focusing on the humanist past, transhumanists tend to be futurists. For instance, one of the main voices in the transhumanist movement is Nick Bostrom, who is the founding director of the Future for Humanity Institute in Oxford. In this section, I consider two types of approaches that transhumanists concern themselves with. The first is the near future and the idea of making incremental improvements

---

3 As I write this in June 2020, there are massive global protests in support of the Black Lives Matter movement, sparked by continual killings of mostly black men by police in the U.S.
to humans. I then consider the more distant future ideas such as mind uploading, which I believe distract more than help the transhumanist cause. However, the most troublesome aspect of much of transhumanism is the foundational idea of the standalone individual that is rooted in the Enlightenment. While I believe this critical flaw needs to be remedied, there are also positive aspects of transhumanism.

My intention here is to not provide a sweeping criticism of transhumanism per se, but to critically engage with some of its fundamental concepts and attempt to tease apart concepts and ideas that can be beneficial from others that I believe are flawed. Rather than focusing on its strong libertarian past, I am encouraged by the increased focus on social democratic ideals from James Hughes (2010a, 2010b, 2012). While I don’t believe all of the problem issues have completely disappeared from transhumanist dialogues, I do believe there is an increased focus on social equity and the acknowledgement of the complexity of human consciousness and cognition. For example, Max More (2013: 10) writes,

The search for absolute foundations for reason, for instance, has given way to a more sophisticated, uncertain, and self-critical form of critical rationalism. The simple, unified self has been replaced by the far more complex and puzzling self revealed by the neurosciences. The utterly unique status of human beings has been superseded by an understanding that we are part of a spectrum of biological organisms and possible non-biological species of the future.

A common idea within the transhumanist field is, ‘within certain limits, […] it is desirable to use emerging technologies to enhance human physical and cognitive capacities and to make other beneficial alterations to human traits’ (Blackford, 2011). Stephen Sorgner (2019) explains, ‘expanding the human health span is a central goal of most transhumanists’ (17). More (2013: 5) coined the term extropy, which concerns perpetual progress, self-transformation, practical optimism, intelligent technology, open society, self-direction, and rational thinking. Perpetual progress is a strong statement of the transhumanist commitment to seek ‘more intelligence, wisdom, and effectiveness, an open-ended lifespan, and the removal of political, cultural, biological, and psychological limits to continuing development. Perpetually overcoming constraints on
our progress and possibilities as individuals, as organizations, and as a species. [...] The implementation of transhumanism is a continual process and not about seeking a state of perfection.4

More’s statement refutes the claim that transhumanists are utopians striving to become perfect. The immediate goal of transhumanism is not necessarily a complete convergence with technology; rather, it is to improve the lives of humans, primarily through the use of technology.

While the transhumanist movement began in the 1980s (Lewis, 2018) with a fair amount of unabashed exuberance, it has since matured and looks more closely at, for instance, the risks involved with new technologies. For example, Bostrom’s Future of Humanity Institute in Oxford (and others) has begun focusing on existential risks (Bostrom, 2013). Additionally, there has been more attention to the societal issues, expanding beyond the focus on the individual (Hughes, 2004, 2012; Wood, 2017). Hughes (2012) states, ‘Much transhumanist politics has been shaped by the libertarian leanings of its affluent, educated, male, and American base. But in the last decade transhumanists have become far more culturally and politically diverse’ (758), moving more toward a liberal democratic focus.

Looking over the Transhumanist Declaration (More & Vita-More, 2013) and the recommitment to the Technoprogressive Declaration (Wood, 2017), I have attempted to distill a vision statement in order to capture the fundamental goals of transhumanism and to make sure that the changes to the philosophical foundations that I later suggest will only further support, and not take away from, this vision. This vision disconnects any necessary link to Enlightenment ideals. The vision of transhumanism I propose is as follows: To reduce suffering, inequality, and premature death—or more positively: to increase access to health, happiness, and longevity of all humans and their environment—through the strategic use (including non-use) of technology. I include the ‘environment’ as an extension to some of the more anthropocentric leanings of the declarations since, without an environment there will be no human flourishing. I do not claim that this vision would be unanimously agreeable to transhumanists, but I do believe it captures much of the current positive intention behind the field.

---

4 More is citing the 2003 version of the Principles of Extropy (https://hpluspedia.org/wiki/Extropian_principles).
5 See also Coeckelbergh (2013).
Transhumanist discussions concerning near-term goals of improving the human condition through technology can still be understood by many outside the movement as being potentially beneficial. However, there are also transhumanist discussions concerning more fantastical scenarios, such as whole brain emulation, also referred to as mind uploading (Bostrom 2014; Kurzweil 2005, 2012; Moravec, 1988; Sandberg, 2013). This is the concept that the brain could possibly be digitized, replacing the biological neurons that are in an on or off state with a computerized/mechanical replacement. The idea is that this process could possibly capture the ‘mind’ and consciousness of a person, making them no longer reliant on a biological body. This potentially would allow their consciousness to live almost indefinitely, or at least greatly enhance their lifespan, and would qualify—at least in the minds of many—as a post-human. This also ties into allowing for easier interstellar travel, allowing for humanity (or post-humanity) to more easily move beyond the confines of the Earth and reducing the existential risk for humans (Bostrom, 2013).

There are others—like myself—who believe that there is no way to separate the brain and the body; the mind exists in both entities (Hayles, 1999; Varela et al., 1992). This concept of mind challenges the transhumanists’ desire to upload our minds into machines by scanning our brains, and at the very least, would indicate the need to upload more than just the brain (maybe a full body upload?). While there are other extreme potentialities entertained by transhumanists, such as variations on a singularity due to super intelligence that may or may not include humans (Kurzweil, 2005), I keep my focus on the more practical near-term goals and the relevancy to understanding the human subject.

Reactions to Transhumanism

As Francis Fukuyama says, ‘It is tempting to dismiss transhumanists as some sort of odd cult, nothing more than science fiction taken too seriously’ (2004: 42). I, myself, have found it difficult at times not to paint transhumanists in a reductive manner, one based more on the early beginnings of transhumanism than on some of the current, more reflective, dialogues that are taking place within the discipline. And yet,
as Fukuyama asks,\(^6\) ‘is the fundamental tenet of transhumanism—that we will someday use biotechnology to make ourselves stronger, smarter, less prone to violence, and longer-lived—really so outlandish?’ (42).

Transhumanists often claim to have to defend themselves against *strawman*\(^7\) attacks. One can see this in various articles and rebuttals throughout Gregory Hansell and William Grassie’s (2011) book on transhumanism and its critics. I myself have struggled with reactionary tendencies while listening to some exuberant self-described transhumanist discuss their—in my opinion—nearly religious belief in the virtues of technological possibilities for human enhancement. However, I have also had the pleasure of having dialogues with transhumanists such as James Hughes, who I find to be intelligent and articulate. In my opinion, Hughes gives many very reasonable arguments for transhumanism, and he, too, has pointed out internal conflicts within transhumanism connected with its ties to the Enlightenment (2010a; 2010b).

I believe that there are several reasons why people react against or misunderstand ideas from transhumanists. Transhumanism’s exuberance towards technology and willingness to embrace long-term possibilities like whole brain emulation can get in the way of some of its more feasible goals and objectives. For some, the focus on mind uploading is a distraction or red herring\(^8\) (Sorgner, 2019), and they believe the focus should stay on the immediate future, working towards improving human health, both mental and physical, and extending human lifespans.

Another aspect that I believe works against transhumanism is the tendency to present technology in a glossy, high-tech, marketing manner\(^9\) rather than grounded and situated, demonstrating both benefits and constraints and highlighting the complexity involved with manipulating living systems. Additionally, there is a tendency to be too focused on the individual, which might be the most difficult to overcome. This focus on

---

\(^6\) Fukuyama’s response to transhumanism was resoundingly negative, claiming the goals fundamentally threaten our human essence.

\(^7\) Philosophical *strawmen* arguments are arguments where the person criticizing a concept first defines the concept without providing all of the context or nuances, allowing them to easily identify flaws.

\(^8\) Red herrings are dried and smoked herrings (the processing turns their coloring reddish) and were, at least anecdotally, used for their smell in order to throw off pursuing dogs or wolves by confusing the scent trail.

\(^9\) Doing a simple web search for images relating to ‘transhumanist’ reveals this.
the exceptional individual has led some to indicate that transhumanism is really ‘ultra-humanist’ (Onishi, 2011: 103).

Ihde (1990: 75–76) describes the concept of ‘technofantasy’, where:

I want the transformation that the technology allows, but I want it in such a way that I am basically unaware of its presence. I want it in such a way that it becomes me. Such a desire both secretly rejects what technologies are and overlooks the transformational effects, which are necessarily tied to human-technology relations.

Don Ihde (2011) links transhumanists with technofantasy and equates the technofantasy to magic in the sense that new human enhancing technologies are often portrayed without ‘ambiguous or unintended or contingent consequences’ (57). He also worries about the unpredictability of these consequences ‘and the introduction of disruptions into an ever-growing and more complex system’ (60). Ihde’s point is that we cannot simply add technology to our lives without experiencing a transformative change—one that enables and constrains (cf. Lewis, 2018). However, I believe that the most fundamental flaw with certain transhumanists is the focus on, and the near sanctity of, the standalone individual.

A New Foundation for Transhumanism

Since the Enlightenment and rational humanism, the de facto basic building block of our existence in the Western world has been the individual, which literally means indivisible (OED online, 4th edition). One way for transhumanists to ‘win’ the human enhancement debate against the bioconservatives is to stop trying to fit into the humanist ideology. In a way, the human enhancement debate is a red herring, as both sides come from a humanist standpoint. There is a need to deterritorialize the human from the standalone individual humanist subject. Figure 4.1 represents the move from a humanist view of the autonomous individual to the relational foundation developed in chapter three. In the humanist representation, Da Vinci’s Vitruvian Man is inside a bold circle, anchoring it to the Enlightenment view of the subject who is self-sufficient, exceptional, and able to achieve enlightenment or self-sustainability purely by ‘his’ own abilities. Instead, my proposed approach builds upon the idea of the subject as constituted through relations.
The underlying issue is that, while transhumanism is a forward-looking discipline, it is still tied to and hampered by its foundation in rational humanist and Enlightenment concepts, dating back to the seventeenth and eighteenth centuries (Hughes, 2010a; More, 2013). While its goals center on improving the human condition through contemporary and future technologies, transhumanism would benefit by taking a critical look into the philosophy it is built upon. As a discipline, it generally views the world and the human condition as complicated but solvable, allowing for an engineering approach to solve many of humanity’s issues (cf. Allenby & Sarewitz, 2011). While transhumanists have had a more liberal (Sharon, 2014) attitude when it comes to using technology to enhance our biological selves, they have still based their approach on the sanctity of the individual. As Hughes (2010b) points out, ‘transhumanists need to understand how the ideological conflicts within transhumanism today are the product of these 300-year-old conflicts within the Enlightenment’ (para. 4).

Transhumanism’s best chance at improving the human population globally is to move away from traditional humanism and begin to embrace the complex posthumanist subject, which is based on the contemporary amodern philosophies of philosophical posthumanism, postphenomenology, and complexity theory. As Barad (2007: ix) states, To be entangled is not simply to be intertwined with another, as in the joining of separate entities, but to lack an independent, self-contained existence. Existence is not an individual affair. Individuals do not preexist their interactions; rather, individuals emerge through and as part of their entangled intra-relating.

Transhumanists represent the desire to go beyond any conservative view of the human, to challenge who we are and explore avenues of
becoming something better. Transhumanism can leave humanism to the bioconservatives and embrace more contemporary disciplines that are better positioned to help fulfill transhumanist’s goals. As Hughes (2010a) points out, ‘Most transhumanists argue the Enlightenment case for Reason without awareness of its self-undermining nature’ (624). Transhumanists would be better served by evolving their thinking, adapting ideas from philosophical posthumanism, complexity, and postphenomenology, moving from technological exuberance to a reflexive and critical (though still affirmative) view on improving humanity through the intentional and critical use of technologies.

According to Samantha Frost (2016: 1),

> The characteristics, qualities, and capacities that heretofore have been taken to define and distinguish a human, humanity—the human—have been so profoundly discredited through historical, social, and scientific analysis that the notion itself seems to be bankrupt, with very little left to recommend it.

At the same time that we find it difficult to find a concise definition of the human, we are also noting the effects humans have made on the planet. We are, amongst other things, a force of nature as we are beginning to take note, as indicated by naming our current geologic age the Anthropocene (Lewis, 2018; Steffen et al., 2007, 2011).

For transhumanists, the post-human is an evolutionary development that will occur as we, through the use of technology, evolve into a species that essentially is no longer human. This is radically different from what the field of philosophical posthumanism defines it as. I use posthuman to refer to a way of defining our selves as we are now (and as we have been). It is an attempt to undermine the prevalent use of the term ‘human’ that is tenaciously linked to the Enlightenment and rational humanist thinking; the concept of the human as a standalone, exceptional individual. The time has come to decisively turn our backs on the idealization of a perfect human speci-man and make the move for inclusivity, diversity, and plurality. It is a posthumanist approach that I will use in developing a way for understanding the effects of new media technologies.
The Posthuman Subject

In this section, I describe the posthuman subject, one that is interrelational, emergent, and complex. This is the co-constituted subject from Chapter 3, and it is the foundational concept upon which the framework in Chapter 5 is constructed. The exploration of the posthuman subject has involved many thinkers (cf. Adams & Thompson, 2016; Badmington, 2011; Barad, 2007; Braidotti, 2002, 2011, 2013, 2016a, 2016b; Ferrando, 2019; Gergen, 2009; Haraway, 1985, 2016; Hayles, 1999; Puech, 2016; Roden, 2014; Wolfe, 2010), not all of whom use, or are comfortable using, the term ‘posthuman’. While the previous section focused on what the human subject is not (countering a humanist version), this section examines what the posthuman is, and affirmatively embraces the concept as a way to reterritorialize the human subject. Braidotti (2013) summarizes the need for this new imagining of the subject by saying ‘we need to devise new social, ethical and discursive schemes of subject formation to match the profound transformation we are undergoing’ (12).

Historically Situating and Defining Posthumanism

In Cyborg Manifesto, Donna Haraway (1985) challenges the boundaries of separation (animal/human, machine/human, male/female) and instead petitions for hybridity by using the concept of the cyborg. This is one of the foundational texts for posthumanism. Another significant contribution to the field is N. Katherine Hayles (1999), How We Became Posthuman. In this book, Hayles specifically takes on transhumanism’s desire of mind uploading and traces the movement back through to its cybernetic roots, explaining how the disembodiment of information has led transhumanists to believe that a separation of the mind and body is possible. Karen Barad (2007: 136) explains posthumanism in opposition to the traditional humanist approach:

Posthumanism, as I intend it here, is not calibrated to the human; on the contrary, it is about taking issue with human exceptionalism while being accountable for the role we play in the differential constitution and differential positioning of the human among other creatures (both living and nonliving). [...] Posthumanism eschews both humanist and structuralist accounts of the subject that position the human as either pure cause or pure effect, and the body as the natural and fixed dividing line
between interiority and exteriority. Posthumanism doesn’t presume the separateness of any-‘thing,’ let alone the alleged spatial, ontological, and epistemological distinction that sets humans apart. The posthumanist subject eschews binaries such as human/nature, nature/culture. It also resists the concept of an exceptional and essential self.

Rosi Braidotti (2002, 2011, 2013) has been highly influential in the field of posthumanism with her *Metamorphoses, Nomadic Theory*, and what is now the classic text of posthumanism, *The Posthuman*. Braidotti (2013) states, ‘I find [posthuman] useful as a term to explore ways of engaging affirmatively with the present, accounting for some of its features in a manner that is empirically grounded without being reductive and remains critical while avoiding negativity’ (5). This affirmative criticism, one that does not fall into postmodernism or nihilism, looks for positive ways of becoming. ‘The strength of posthuman critical thought […] is in providing a frame for affirmative ethics and politics’ (Braidotti, 2016a: 23). Michel Foucault’s (1970) ‘death of man’ (373) offers the opportunity for a new approach for human becomings and is seen as an opportunity rather than a loss.

Employing an affirmative critical outlook allows one to acknowledge the very real current inequities and problems and then to implement creative and positive potential responses. ‘The selection of the affective forces that propel the process of becoming posthuman is regulated by an ethics of joy and affirmation that functions through the transformation of negative into positive passions’ (Braidotti, 2016a: 26). Francis Ferrando (2019: 187) neatly summarizes posthumanism as,

the philosophy of our age. The posthumanization of society is happening. Even if anthropocentric and dichotomic tendencies are still regarded as the norm, a growing number of beings are becoming aware for the need of a paradigm shift, and are thus revisiting old concepts and new values from a different perspective, bringing together post-humanist, post-anthropocentric, and post-dualistic insights.

Postphenomenology and posthumanism have many similarities. They are anti-essentialist and relational, concentrating on situated and embodied beings-in-the-world. Both are amodern, avoiding Cartesian dualism and the idea of an autonomous and independent individual.

---

10 See also Han-Pile (2010).
The subject is perceived not as static but a process, constantly being constituted through its relations. And in general, while both conceive of the entanglement and co-constitutionality of subjects and objects, postphenomenology directs its focus primarily on technologies while posthumanism concentrates more on understanding the subject. As many amodern—neither modern nor postmodern—schools of thought\(^\text{11}\) believe, the individual is never an autonomous, standalone entity, but one that is always in, and being constituted by, relations. Kenneth Gergen (2009) states, ‘there is no isolated self or fully private experience. Rather, we exist in a world of co-constitution’ (xv).

Braidotti (2016a) writes about the ‘posthuman turn’ in philosophy and describes ‘an explosion of scholarship on nonhuman, inhuman and posthuman issues’ (13). Ferrando (2013) identifies various types of posthumanism: critical, cultural, and philosophical.\(^\text{12}\) Recently, Ferrando discusses philosophical posthumanism (2019), which is the posthuman area most attuned with my focus. While there is no agreement on a single definition for the term ‘posthuman’, I follow Ferrando’s (2019) description for philosophical posthumanism, which is post-humanist, post-anthropocentric, and post-dualist. According to Ferrando, ‘these three aspects should be addressed in conjunction, which means an account based on a philosophical posthumanist approach shall have a posthumanist sensitivity as well as a post-anthropocentric and a post-dualistic one’ (54). This inclusive definition with the three aspects is how I use the terms posthuman or posthumanism throughout the book.

Looking more closely at the three aspects, a post-humanist approach (one that is beyond or after a humanist approach) should be fairly clear after covering the humanist ideas in the previous section. The second aspect, a post-anthropocentric approach, discusses the human as removed from the center of all things and the exceptionalism that

\(^{11}\) For example: complexity theory, actor-network theory, or postphenomenology.

\(^{12}\) Ferrando (2013) states, ‘(T)he posthuman turn was fully enacted by feminist theorists in the Nineties, within the field of literary criticism—what will later be defined as critical posthumanism. Simultaneously, cultural studies also embraced it, producing a specific take which has been referred to as cultural posthumanism. By the end of the 1990s (critical and cultural) posthumanism developed into a more philosophically focused inquiry (now referred to as philosophical posthumanism), in a comprehensive attempt to re-access each field of philosophical investigation through a newly gained awareness of the limits of previous anthropocentric and humanistic assumptions’ (29).
has surrounded this idea since the Enlightenment. There is some irony in discussing the human in a post-anthropocentric way when we so recently have claimed to be now in a new geologic age called the Anthropocene (Lewis, 2018). However, the Anthropocene focuses on the effects we have had on the planet, not our place in it.

And the third aspect, post-binary, refutes a modernist, mechanistic, reductivist, or positivist worldview, which often approach the world in terms of dualisms or binaries: nature/culture, humans/others, agency/determinism, mind/body, etc. Instead of an either/or mentality, Braidotti (2016b) describes using ‘and ... and’ as a more inclusive choice (31). Ferrando (2019) further explains, ‘The posthuman destabilizes the limits and symbolic borders posed by the notion of the human. Dualisms such as human/animal, human/machine, and more in general, human/nonhuman are re-investigated through a perception which does not work on oppositional schemata’ (5; cf. Haraway, 1985).

Braidotti’s (2013) research is strongly connected with Gilles Deleuze and Félix Guattari (1988) and builds upon feminist and post-colonialist work, specifically focusing on the interrelatedness of all life—including the human—within a vast living network. Posthumanism calls for a move away from the reductive, atomistic, rational-science mentality that attempts to understand the whole by breaking things down to its parts, and towards a productive and generative philosophy, which includes building relations and interdependencies that actually reflect the complexities of life.

In general, posthumanists are affirmative of life, believe in the importance of de-centering the human, and approach the world with a holistic and interrelated perspective. We are situated and embodied beings, taking ownership by acknowledging our own background and being honestly open to others. This involves the larger situatedness of being a part of the sixth mass extinction on the planet (Cafaro, 2015) and understanding that it is in our own best interest to attempt to have a positive effect on this situation. We are also situated in the fourth industrial revolution (Schwab, 2017), where technologies for most, but not all, of the humans in the world have a dramatically increased role to play. And while not all of us may be directly affected by this technological revolution, we are all affected by the current mass extinction that is happening.
The Dance of Agency

Reconceptualizing the individual involves reconceptualizing agency. As discussed in Chapter 3, postphenomenology\(^\text{13}\) makes the case that our relations with technological objects are non-neutral and share in a portion of agency. Even before any physical convergence of technology and human, relational disciplines within philosophy of technology have been describing how agency, which primarily remained in the domain of the modern humanist subject, is actually shared with technological objects. The most elegant phrasing I found for the concept of shared agency—which is similar to postphenomenology’s concept of non-neutrality—is Andrew Pickering’s (2005) *dance of agency*. Pickering describes how there is a ‘temporal emergence’ (35, italics in original), where the posthuman object,

\[
\text{does not display the atemporal regularities that physics, ecology or sociology like to look for [...]. This shift exposes a genuine posthuman object which lies [...] along at least two axes: it is a unity that spans what are usually held apart — the human and the non-human—and this unity is essentially temporal: the coupling of the human and the non-human is situated in time, in the dance of agency.}
\]

Posthumanism attempts to unlearn the gestalt of the individual. However, an either/or mentality might assume that if we are not individuals, then we may lose our free will, potentially becoming Borg-like,\(^\text{14}\) determined beings (Liberati, 2018). Throughout this book I attempt to avoid the binary choice of either/or, preferring to use an ‘and ... and’ approach (cf. Braidotti, 2016b: 31), which allows us to be positioned between determinism and agency (cf. Fig. 4.2). The fictional ‘Borg’ are interrelational, but—for the ‘drones’—with little to no agency. We our selves are made up of thousands upon thousands of relations, yet we still retain some agency. Relations are dynamic, coming into existence as we move through both space and time and increase or decrease in influence, depending upon the interplay of other relations (cf. Chapter 5).

\(^{13}\) Others also make this case, for example, Bruno Latour (1987) and actor-network theorists.

\(^{14}\) The Borg are a fictional alien race—from the Star Trek series—where all the ‘drones’ are connected to the collective mind and have no individual agency (Consalvo, 2004).
As Gergen (2009) notes, ‘The attempt in this case is to reconfigure agency in such a way that we [...] bring relationship into the center of our concerns. By viewing agency as an action within relationship, we move in exactly this direction’ (82). Through awareness we can increase our agency and affect the different relations we are in.\textsuperscript{15} As Foucault (Foucault et al., 1987) points out, ‘these relationships of power are changeable relations, i.e., they can modify themselves, they are not given once and for all’ (123). We cannot choose not to be in certain relations, such as the power of discipline in society (Foucault, 1995), but we do have a certain amount of agency in how we interact with that power. And, the more we are aware of the relationships that affect us, the more likely it is to increase our agency. Christian Ehret and Daniella D’Amico (2019) sum this up nicely stating, ‘Agency is therefore not a matter of human power over the world, but of nonhuman and human bodies’ emergent capacities to affect and to be affected as becoming part of the world’ (148).

Individual to Interdividual to Human Becomings

While the idea of being an individual is compelling and, for some, self-evident, this view is becoming more problematic. Bruno Latour (1993) makes the case that we have never been a modern standalone person and, ‘So long as humanism is constructed through contrast with the object that has been abandoned to epistemology, neither the human nor the nonhuman can be understood’ (136). Here Latour is deriding the practice of perceiving objects as only epistemological ‘things’ that do not play an agential role. Instead, Latour (1987, 1993) seeks to understand

\textsuperscript{15} See Chapter 2, section ‘Education, Literacy, Agency’ and Chapter 3, section ‘Technological Determinism and Agency’.
the human in a symmetrical way with the other non-human ‘actants’ in the world all possessing a certain degree of agency.

What is needed is a gestalt change in our conception of our selves as individuals. Braidotti (2013) states, ‘Individualism is not an intrinsic part of “human nature”, as liberal thinkers are prone to believe, but rather a historically and culturally specific discursive formation, one which, moreover, is becoming increasingly problematic’ (24). The specific language we use is important in how the understanding of the human subject is conceived. Terms such as ‘human’ and ‘individual’ carry a historicity that is entangled with hundreds, if not thousands, of years (Han-Pile, 2010).

One approach is to use new terms or neologisms in order to bypass this issue, though this also is not ideal, especially if the new term is not easily understood and resists adoption into the lexicon of the society it aims to improve. For instance, René Girard (1978) uses the term ‘interindividual’. We are not individuals with various relations, but rather it is the relations that constitute us as ‘interindividuals’. Chris Fleming (2004), describes Girard’s concept of the interindividual as being ‘constituted, at base, by its interactions with others. “Individuality” then, strictly speaking, doesn’t exist — it is always already “interindividuality”’ (36). However, so far there is not much widespread usage of the term.

The dance of agency and co-constitution of the subject through its relations can be brought together in what Pickering (2010) calls an ‘ontology of becoming’ (30). Describing our selves thus moves away from the static implication of a ‘human being’, and some researchers are now using the term ‘human becoming’ (cf. Ingold, 2013; Zylinska, 2009) in order to enact a gestalt shift on how we perceive our selves. For Braidotti (2002), ‘the point is not to know who we are, but rather what, at last, we want to become, how to represent mutations, changes and transformations, rather than Being in its classical modes’ (2).

Braidotti’s (2011) concept of nomadic subjectivity also pushes against the concept of an essential and static subject. In her *Nomadic Theory*, Braidotti investigates the structure of subjectivity (2011: 66), exploring ideas such as becoming animal, becoming earth, or becoming machine. We are always emergent, changing, a process of continual becoming.

---

16 Ihde (2009: 44) similarly discusses an interrelational ontology where humans and their technologies are co-constituted.
Our relations are never static and vary highly in their influence upon us, each changing as we our selves change.

Barad (2007: 139, italics in original) approaches the idea of becoming through her concept of intra-action:

The notion of *intra-action* (in contrast to the usual ‘interaction,’ which presumes the prior existence of independent entities or relata) represents a profound conceptual shift. It is through specific agential intra-actions that the boundaries and properties of the components of phenomena become determinate and that particular concepts (that is, particular material articulations of the world) become meaningful... rather, *phenomena are the ontological inseparability/entanglement of intra-acting ‘agencies’*.

In other words, subjects and objects emerge—become—through their relation as discussed in Chapter 3 (see Fig. 3.1).

Continuing in the interdisciplinary spirit, certain researchers in contemporary anthropology have also begun using the concept of becoming; specifically, Tim Ingold and Gísli Pálsson’s (2013) book on *Biosocial Becomings*. In that book, Ingold (2013: 20) writes that we need to think of humanity not as a fixed and given condition but as a relational achievement. It requires us to think of evolution not as change along lines of descent but as the developmental unfolding of the entire matrix of relations within which forms of life (human and non-human) emerge and are held in place. And it requires us to think of these forms as neither genetically nor culturally configured but as emergent outcomes of the dynamic self-organization of developmental systems.

In summary, ‘there is the shift away from an epistemological theory or representation to an ontology of becoming’ (Braidotti, 2011: 214). Another way of framing this is by using the concept of multistability

---

17 Other philosophers have also stressed the aspect of becoming, as can be understood through Henri Bergson’s (1965) understanding of time as duration (flow) rather than a fixity or instant. It also is similar to Heidegger’s (as cited in Sheehan, 2014) notion of thrown-openness of ex-sistence, ‘the always-already-operative “unfolding” (*Zeitigung*)’ or emergence of being (266). And, ‘The characteristic property of a duration is termed “unison of becoming”’ (Whitehead, 1978: 126). Stengers (2008) explains, ‘What Whitehead calls a subject is the very process of the becoming together, of becoming one and being enjoyed as one, of a many that are initially given as stemming from elsewhere’ (103). This continual process of becoming for the subject fits within posthumanism’s concept of exploring an *ethics of becoming* (Braidotti, 2013).
from postphenomenology. However, rather than the multistability of an object, we can use it to conceptualize the multistability of the subject. This fits nicely into the idea that we are not one stable thing. On the contrary, we are always becoming, changing moment to moment. We nurture a way of perceiving the self in multiple ways, moving beyond any single understanding. By undermining the idea of a stable subject, we open up space, allowing the posthuman subject room to become.

**Complexity:**

The Key to Understanding Human Becomings

The key to reterritorializing the human subject to the posthuman subject is through the concept of complexity. Complexity is an inclusive approach that focuses on a system’s interrelationality rather than trying to understand a system by reducing it to its components. The section in Chapter 3 on media ecology briefly introduced complexity. In this section I discuss complexity in more depth, highlighting concepts that are fundamental to creating the framework in Chapter 5, thereby helping to situate the complex interrelationality of media.

There are various overlapping terms that describe or use complexity theory, some of which include: chaos theory, cybernetics, non-linear dynamics, general systems theory, quantum mechanics, and non-linear (or complex) adaptive systems. The approach to complexity that I use is a continental approach, similar to Ilya Prigogine and Isabelle Stengers’ works (1984, 1997), rather than the more analytic approach of the Santa Fe Institute (Mitchell, 2009)—or what Edgar Morin (2007) calls restricted complexity. The continental view approaches complexity more critically. ‘This view argues that complexity theory does not provide us with exact tools to solve our complex problems, but shows us (in a rigorous way) exactly why these problems are so difficult’ (Cilliers, 2005: 257).

Posthumanist researchers often bring up issues of complexity. Braidotti (2013) states, ‘Nomadic subjectivity is the social branch of complexity theory’ (87). Her concept of the nomadic subject equates with the posthuman subject, one that is not constrained by geographies (physical or mental), but rather is constantly becoming and interrelated with the world. This interrelation with the world is at the forefront of the question Hayles (1995) poses: ‘What happens if we begin from
the premise not that we know reality because we are separate from it (traditional objectivity), but that we can know the world because we are connected with it?’ (48). Complexity theory describes open systems that are fluid and autopoietic (self-organizing and generative). They are in a state of tension between chaos and stasis, described as being in non-linear equilibrium. They do not always respond in a linear cause and effect manner, which makes future states of being almost impossible to predict. However, in complex systems, the more diverse relations there are in the system, the more resilient the system often is.

Situating Complexity

Complexity is a critical shift in comprehending the nature of interrelationality and opposes some of the main assumptions of modernity. While complexity is a common thread that runs through media ecology and posthumanism, it is generally not articulated specifically in a way that foregrounds its traits (some exceptions in media ecology are Logan, 2015; Qvortrup, 2006; and in posthumanism Barad, 2007; Hayles, 1999; Roden, 2014). Complexity has roots in quantum mechanics, directly challenging the classical Newtonian mechanics, which focused on objective truth, linear causality, and clear divisions between humans and their world.

Hayles (1990, 1991) has written about chaos and complexity. Hayles (2014: 204–5) uses complexity with regard to human subjectivity in the following:

The same faculty that makes us aware of ourselves as selves also partially blinds us to the complexity of the biological, social, and technological systems in which we are embedded, tending to make us think we are the most important actors and that we can control the consequences of our actions and those of other agents.

Braidotti (2002: 8) employs complexity in the concept of nomadic becomings, where she has sought ‘a style of thinking that adequately reflects the complexities of the process itself’. And Barad (2007) suggests that complexity fundamentally alters our perception from being autonomous, humanist subjects to beings constituted in our intra-relations. According to Barad, ‘Intentionality might better be understood as attributable to a complex network of human and nonhuman agents,
including historically specific sets of material conditions that exceed the traditional notion of the individual’ (23).

Complex or Complicated?

The social sciences are now occasionally using complexity in order to analyze societies and social relations (Byrne & Callaghan, 2014; Turner & Baker, 2019; Urry, 2003, 2005a, 2005b, 2007). While in some research there is a very rigorous definition of complexity that is adhered to, in others the term ‘complexity’ is used in a manner that leaves it ambiguous and loosely defined (if it is defined at all). Sometimes it is used in a way that would better be served by the adjective ‘complicated’.

For example, in postphenomenology Ihde (1990) uses complexity as it is meant in complexity theory when he states ‘multistability also may be seen in human-technology relations and even more strongly in the complexities of technology-culture gestalts’ (146). However, in the same book, Technology and the Lifeworld, he occasionally uses complex when referring to complicated technologies. For instance, he refers to kidney dialysis machines as ‘large, complex, very expensive to operate, and of limited quantity’ (178).

Roberto Poli (2013: 142) succinctly describes the difference between complicated and complex systems thus:

Complicated problems originate from causes that can be individually distinguished; they can be addressed piece by piece; for each input to the system there is a proportionate output; the relevant systems can be controlled and the problems they present admit permanent solutions. On the other hand, complex problems and systems result from networks of multiple interacting causes that cannot be individually distinguished; must be addressed as entire systems, that is they cannot be addressed in a piecemeal way; they are such that small inputs may result in disproportionate effects; the problems they present cannot be solved once and for ever, but require to be systematically managed and typically any intervention merges into new problems as a result of the interventions dealing with them; and the relevant systems cannot be controlled.

To put this another way, complicated systems are closed systems that can be engineered and (mostly) controlled in situations where there is a good possibility of accurately predicting causal outcomes. Sending a rover to Mars is an example of a complicated system that responds very
well to controlled engineering. However, living systems, such as the human subject, are complex systems, which are open systems comprised of interrelating and constituting parts that are in a state of non-linear equilibrium, causing constant and irreversible emergence while nested within—and nesting their own—complex systems. While we have a significant amount of control in complicated systems, we have far less ability to control complex systems. Ecological and biological sciences now often embrace complexity in how they model living systems (Smith & Jenks, 2006).

Connections, not Divisions

Complexity focuses on connections rather than divisions. Morin (2007) points out, ‘Since we have been domesticated by our education which taught us much more to separate than to connect, our aptitude for connecting is underdeveloped and our aptitude for separating is overdeveloped’ (21). The concept of complexity helps provide a posthuman lens for media literacy, where constituting media relations are situated within the complexity of interrelations in our lives. Complexity aids our ability to focus on both the whole system and the parts that make up the system, without losing sight of either. Rather than approaching situations by reducing and dividing in order to gain understanding, Barad (2007) argues for using a *diffractive* approach, one that is, ‘attuned to the entanglement of the apparatuses of production, one that enables genealogical analyses of how boundaries are produced rather than presuming sets of well-worn binaries in advance’ (29–30; see also Mazzei, 2014).

Understanding complexity helps realign assumptions concerning both what we can know and how things are. This brings together both ontology and epistemology. Barad (2007) supports this combining, saying:

*We don’t obtain knowledge by standing outside the world; we know because we are of the world. We are part of the world in its differential becoming. The separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind and body, matter and discourse. *Onto-epistem-ology*—the study of practices of knowing in being—is probably a better way to think about the kind of*
understandings that we need to come to terms with how specific intra-actions matter. (185)

Rather than using complexity as a theory, I am using it as an ontological (practice of knowing in being) foundation in order to create the posthuman approach. Using complexity is a way of perceiving the interconnections of things, rather than a separating or reducing systems down in order to find invariants or essences. It is about seeking the constituting linkages of relationality instead of reducing in order to identify. This helps gather the constitutive relations of the human subject into a useful framework that allows us to situate, illuminate, and reflect upon our human becoming-ness, primarily with regard to media technology relations.

Complex Concepts for Framework

Complexity itself is difficult to reduce down into clear and separate concepts, as the various aspects of complexity interact and affect each other. However, I identify three main interconnected concepts from complexity theory that are used to reframe the human subject: open systems, non-linearity, and emergence. These three concepts are useful for understanding the framework I develop.

Open and Nested Systems

Understanding complexity is facilitated through the understanding of two types of systems: open and closed. Open systems are complex and closed systems are complicated (or simple). Fritjof Capra (2002) explains, ‘At all scales of nature, we find living systems nesting within other living systems—networks within networks’ (231). These complex open systems are nested within larger complex environments, where they exchange matter and energy. While complex systems are bounded in some manner, their boundaries are permeable, and they ‘are not boundaries of separation but boundaries of identity. All living systems communicate with one another and share resources across their boundaries’ (Capra, 2002: 231).

Understanding that complex systems can be nested within other complex systems helps to provide context. According to Capra (1996: 37),
The properties of the parts are not intrinsic properties but can be understood only within the context of the larger whole. Thus systems thinking is ‘contextual’ thinking; and since explaining things in terms of their context means explaining them in terms of their environment, we can also say that all systems thinking is environmental thinking.

This is similar to the aspect of domestication theory I discussed in Chapter 2, where Maren Hartmann (2006) points out how the complex context makes the actual application of the domestication theory very difficult. I develop the framework in order to specifically help in this regard.

**Non-Linear Equilibrium**

One of the founding voices in complexity theory, Nobel Laureate Ilya Prigogine (Prigogine & Stengers, 1984, 1997), calls complex systems ‘dissipative structures’. The traits of these structures are the irreversibility of time (complex systems change and can never be returned to an original condition) and probability (unpredictability). The irreversibility of time counters the classical Newtonian model that upholds the idea that time is reversible.

This notion counters the classic linear cause and effect idea stemming from Newtonian mechanics (Barad, 2007; Hayles, 1991). Rather than rational causality (cause and effect being relatively equal), complexity places relations in non-linear equilibrium where predictability no longer applies, replaced by probabilities. Non-linear equilibrium enables the possibility of small changes having large effects. Yet, the reverse is also true: large changes can have very little effect on a system. Complexity is not unstructured chaos where no relations exist, but rather a tremendous number of relations all interrelating.

Complex systems are in a state of non-linear equilibrium, kept there through the input of energy and material from outside the system, as well as ‘waste’ that leaves the system. Capra (2005) states, ‘A living organism is an open system that maintains itself in a state far from equilibrium, and yet is stable: the same overall structure is maintained in spite of an

---

18 This is often referred to as the butterfly effect, where under specific initial conditions, the air movement from a butterfly’s wing can potentially cause a tornado a great distance away (Lorenz, 1972).
ongoing flow and change of components’ (37). This interrelational non-linearity leads systems to be self-generating.

Emergence, Resilience, and Sympoiesis

Because these open systems are in an interrelational state of non-linear equilibrium, they self-organize without a guiding organizer. This is most commonly known as autopoiesis, which is a quality of all living complex systems (Capra, 1996). Citing Humberto Maturana and Francisco Varela’s (1972) essay that first defined autopoiesis, Capra (1996) explains that auto ‘means “self” and refers to the autonomy of self-organizing systems; and poiesis—which shares the same Greek root as the word “poetry”—means “making.” So autopoiesis means “self-making”’ (97). Melanie Mitchell (2009) describes ‘systems in which organized behavior arises without an internal or external controller or leader are sometimes called self-organizing. Since simple rules produce complex behavior in hard-to-predict ways, the macroscopic behavior of such systems is sometimes called emergent’ (13). Other ways to describe this aspect that have been used are ‘generative’ and ‘adaptable’.

Haraway (2016), however, prefers using the term ‘sympoiesis’ rather than autopoiesis. According to Haraway, ‘Sympoiesis is a simple word; it means “making-with.” Nothing makes itself; nothing is really autopoietic or self-organizing. […] Sympoiesis enfolds autopoiesis and generatively unfurls and extends it’ (58). Ferrando (2019) concurs, saying of autopoiesis that it ‘does not seem to take enough into account [of] all the necessary relations and exchanges that occur between the organism and the environment’ (141).

While complex systems are not organized from outside the system (being self-organized), they do respond to outside influences. The resilience of a system is how it is able to adapt to these outside disturbances and still retain its identity. In complex ecosystems, it has been shown that the more diversity that a complex system has, the more likely it is to be able to be resilient in the face of perturbations (Folke, 2006; Levin, 1998). Discussing the principles of ecology, Capra (2002) states, ‘Ecosystems achieve stability and resilience through the richness
and complexity of their ecological webs. The greater their biodiversity, the more resilient they will be’ (231).

Paul Cilliers (2005) explains, ‘Complex systems are not balanced on a knife’s edge between chaos and order. They have mostly robust structures, which change over time and enable the system to respond to different circumstances’ (264). These important concepts of open and non-linear emergent systems are part of the foundation for creating the framework in Chapter 5. However, before moving to the actual framework there are a couple aspects to note concerning technology and complexity.

Complexity and Technology

There are two aspects of technology that intersect with complexity. The first aspect is that traditional technologies can be primarily perceived as closed systems, which can be complicated but do not often count as being complex. These are technological artifacts, bounded and engineered. But once these technologies are nested or merged within complex systems—such as embedding a technology within the human body—we lose an aspect of control, reducing predictability to probability as to the effects those technologies cause. For example, the printing press itself is a closed technological system. However, when implementing it within sociocultural environments, it affects them in complex ways.

The second aspect is that there are some types of technologies that are moving away from being closed, complicated systems and qualifying as new complex systems (see Fig. 4.3). AI (artificial intelligence) and machine learning exemplify this idea; we no longer control and write specific code but rather let machine learning do it sympoietically. We are developing true black box technology, where in some cases we can no longer pinpoint how a specific decision or answer is reached. This goes in the opposite direction of the transhumanists who want to upload their consciousness into machines. Their desire can be understood as a desire to have more control over the complexities of biological living systems by housing a person’s consciousness in a more controllable ‘closed’ mechanical system (see Fig. 4.3).
Quantum computing is also another move away from complicated closed systems and into the realm of complex open systems. The standard computer ‘bit’ is replaced in quantum computing with quantum bits—or ‘qubits’, which ‘can assume multiple states simultaneously, rather than simply representing a 0 or 1, as bits do in classical computing’ (Castelvecchi, 2017: 59). Google recently claimed to have reached ‘quantum supremacy’ using a quantum computer with 53 qubits (Arute et al., 2019). Frank Arute et al. ran an experiment that complete a calculation in 200 seconds, where a ‘state-of-the-art classical supercomputer would take approximately 10,000 years’ (505). At the time of writing, quantum computing has not fully arrived, but it appears to be just over the horizon (Gyongyosi & Imre, 2019).

**Summarizing the Complex Posthuman Subject**

As Braidotti (2013) notes, humanist ideas are tenacious and not easily moved away from (cf. 26–30). The concept of the ideal, exceptional, autonomous individual human is deeply rooted in the minds of many individuals in the Western world. Even if we ontologically understand how we are relational beings, entangled and co-constituted by the things and the world around us, we still inherently have a sense of our individuality or separateness from the world of things (Van Den Eede, 2015a).

Hayles (1991) explains that the greatest implication of understanding complexity is ‘not in how the world actually is [...] but how it is seen’ (8). This change in perception helps to re-envision the human subject from an
autonomous individual to a continually becoming interrelational being through co-constituting relations (cf. Fig. 4.3). The idea of complexity as a foundation for how we exist in the world undermines the modern mindset of an individual being living in a linearly causal world, replacing it with the concept of a complex and interrelated becoming. As Pickering (2011) states, ‘The self, as revealed here, turns out to be inexhaustibly emergent, just like the world—the antithesis of the given human essence of the Enlightenment and cybernetic immortality’ (86).

The concept of complexity shifts the gestalt from the individual subject to the complex and multistable posthuman subject. We are always and already in relation, not only with other humans but also with technologies and the world. My mind does not solely exist in isolation in my body; my mind is in relation with the world around me. These relations are complex, situated, dynamic, and emergent. How these relations influence me continually changes. Even the ability to bring my awareness to a particular relation can affect the amount of influence the relation has on me.

**Concluding Thoughts**

Posthumanism, complexity theory, and postphenomenology all focus on the interrelatedness of existence, the notion that there is no standalone individual. This is a powerful concept that helps steer our understanding away from reductionist thinking toward thinking in terms of inclusive and interrelated systems. This mindset is not only helpful when thinking about using technologies to improve or ‘fix’ something, including our selves, but also when we invite new types of media into our lives. According to Sharon (2014: 135),

> The human being is conceptualized here not as an independent and autonomous entity with clear cut boundaries but as a heterogeneous subject whose self-definition is continuously shifting, and that exists in a complex network of human and non-human agents and the technologies that mediate between them.

A common issue in research is a too-narrow focus on a limited number of influencing relations. Instead, we exist within a complexity of relations, most of which exist in the background of our awareness (where they still have an effect upon us). Rather than one or two determining
factors in our lives there is a complexity of influencing relations: social, technological, temporal, and spatial. This network of relations is a living web in that it is dynamic and ever changing. Each relation increasing or decreasing its influence depends upon a multitude of factors, not least, our own awareness of the relation. While we are mostly, but not always, in a stable equilibrium, this equilibrium is not static, but is constantly evolving as we move through time.

We are complex systems (ecosystems), greater than the sum of our parts. We exist, or are nested, within greater complex systems, not discreetly, but as entangled and co-constituting. This chapter has moved the focus from media and technology towards the concept of the human subject, and in order to understand how media and technology affect ‘us’, we need an understanding of who and what the ‘us’ actually is.

The approach for most transhumanists is to perceive technology—and our selves—as complicated but understandable and ‘engineerable’. Their primary desire is to use technology to enhance and improve the human condition, pushing back against old age and disease, in order to bootstrap the individual into an enhanced version of their idealized self. Their desire is for the human-technology convergence to bring the understandability and controllability into the realm of life itself. Unfortunately, we are not complicated, but complex beings. And, to quote an acute insight from businessman Dave Gray (2009), ‘When you make the complicated simple, you make it better. When you make the complex simple, you make it wrong’ (n.p.). In order to create a more accurate understanding of how technology and living systems relate, we need to reframe the foundation of the human subject from the standalone autonomous individual to an inter-related and complex post-humanist subject.

The term of ‘technofantasy’, as defined by Ihde (2011), refers to the idea that we want the benefits of technology without being changed. This ignores the non-neutral aspect of technologies, which bring both benefits and drawbacks. Since we are fundamentally relational, we change any time one of our relations change. By overcoming this technofantasy attitude, we become more realistic in our expectations of our relations with technologies. Every technological relation is transformative, both enabling and constraining. Invited or not, every time a technology enters our lives we are irreversibly changed. The idea
of the irreversibility of time, coming from complexity theory, also helps in our understanding by removing the idea that we can undo some experiment that did not work out. While we might be able to undo some aspects of the experiment, we cannot completely return to the way we were.

The idea of the complex posthuman subject helps bring a relational and inclusive perspective rather than one that is individual and reductive; an understanding that living systems are complex systems that do not necessarily respond in a predictive manner; and a more realistic and grounded understanding of non-neutrality of technology. We can and should use technology to help improve our lives, but we should go about it in an inclusive, interrelated, and pragmatic manner. Given this post-humanist, non-dualist, non-anthropocentric, and complex human becoming, I offer a situating and comprehensive framework in the next chapter in order to understand the interrelational constitution of such a human subject. I suggest a cartography, not to prescribe or dissect the relations into separate and discrete categories, but as a way to take a particular situation—say a media-related event—and probe the various groupings of relations in order to uncover and foreground some of the complex interrelations that contribute to the human subject’s becoming.
