Technologies of Attention:
Distraction, Fast Switching & Multi-Attention

## Chapter 1: Introduction

What is similar in being in a bustling café working on your laptop, talking on the cellphone while walking on the street, and sitting nervously at the dentist’s chair staring at the overhead television screen? One answer lies in the necessary mode of attention: All these actions involve multiple attentions of different degrees. Yet, the conventional approach to attention tends to categorize such situations as distraction, such as with cases like mothers who talk on their cellphones while taking care of their babies, or children who play video games and listen to music while doing their homeworks. The recognized exceptions on this conventional view are male professionals like airplane pilots and day-traders, whose ability to simultaneously focus on several screens and indicators is heralded.

These situations share another common denominator. They also involve technologies in ways unimaginable a few decades ago. These technologies shape our attention thereby leading to a debate on whether digital technologies damage our attention. Whereas the “common wisdom” assumes that those situations are distractive, in this book I sketch and defend a different approach. The view I argue for centers on the role of technologies while resisting the tendency to classify them as either good or bad. Following Don Ihde, I argue that technologies are neither good nor bad and not even neutral. Technologies mediate the world for us, change how we view the world, how we move in it, and how we pay attention. Most research on attention ignores the role of technology, treating it at best instrumentally, as a tool to study this human capability, or, in the critical variation, as that which causes distraction. The link between distraction and technology can be traced back to the nineteenth century when attention and distraction formed a dichotomy (Crary, 1999), placing technologies on the side of distraction. Today, when twenty-first century technologies such as laptops and cellphones are involved in the control of attention, technologies are still assumed to be “problematic,” regarded as distractors for our attention to the extent that media multitasking and digital distraction become equivalents (Aagaard, 2019).

My approach is different. I draw on feminist research on patchwork and quilting as practices opposing the hegemonic linear thinking, planning and execution ((Showalter, 1991); (Flannery, 2001)). The attention of those women engaged in quilting was always already multiple, as they were contemplating on the collected pieces of textiles and designing the pattern *while* taking care of the various house chores (see (Gilbert & von Wallmenich, 2014)). It was classified as multi-tasking which was perceived as opposed to focusing (ibid). No wonder that even today women are frequently criticized for their efforts to maintain a career while raising children and taking care of their family…

The framework suggested in this book refers to attention in the plural. Such an approach bypasses the alleged opposition between focusing and multitasking. Furthermore, the framework integrates technologies as an enabler of multi-attention. In other words, I argue that attention can be multiple with the *help* of technologies, so that we - as users - can pay attention to several targets simultaneously.

Multi-attention is an interdisciplinary concept. It can be explained phenomenologically by showing how our experience of the world has always been multiple because our senses work in parallel (e.g., (Irwin, 2014); (Michelfelder, 2014)). In brain research, multi-attention has been demonstrated in experiments where subjects could attend to more than one target within one sense, like for example seeing two objects at the same time (McMains and Somers, 2004). From mind theories perspective, the example of listening to a jazz band serves to explain how we can listen to the piano and still hear the drums and the saxophone (Watzl, 2017).

One critique against multi-attention theories is frequently framed in terms of “multi-tasking,” which is borrowed from computer science. This notion denotes the ability of a computer to process more than one task at a time. In computers, this occurs when different processing units work side by side in parallel. In the early days of computing, when computers had only one processor, multi-tasking was implemented in that single unit by switching between the tasks. When the switching was fast, one could get the (false) impression of simultaneousness. Such an architecture led some critical thinkers to regard multi-tasking as “mission impossible” and to claim that one can be on-task or off-task as per a given task. When attention is conceived as a single process, it was deemed as something that could not be “divided” or “split.” If the attention splits or divides, it should suffer from reduced performance thereby weakening the functioning of the mental system. Therefore, attentional multitasking is considered unworkable. Attention can only be diverted (e.g., (Carr, 2010); (Stiegler, 2010); (Aagaard, 2019)). A variation of this claim argues that the switching between tasks is frequently too fast and often leads to the likelihood of performance decrease in at least one of the tasks.

Another related claim against multi attention is dubbed “information overload,” which is another catchphrase borrowed from computer science to convey a message of a system’s malfunctioning due to too many external inputs. According to this line of critique, while information and technology belong to the outside world, they require attention which is a purely internal affair of the brain. Due to its “computerized” architecture, the brain cannot handle two inputs concurrently. Again, the technical limitations of the early computers are imputed to the human mental capabilities.

An additional “imported” paradigm is that of the limited resources. This line of critique comes from economics, specifically the analyses of production weighing the efficient allocation of raw materials versus the processing capacity of a machine or a factory. Both raw materials and processing capacities are finite and hence limited. In the context of attention, the equivalent of raw materials is “objective stimuli” and the processing capacity is paralleled with the “subjective mind.” The claim is that we cannot see and hear everything, and in terms of attention we cannot attend to all the stimuli around us. Attention as a limited cognitive resource of the brain functions economically so that when two stimuli arrive to the brain, there is “a resource conflict” and the attentional mechanism needs to select one (Salvucci p. 58). Similar to “multi-tasking,” it is as if the brain can handle only one stimulus at the time. Moreover, if attention switches quickly between the stimuli, its quality decreases.

The computational and the economic paradigms share the same underlying assumption: attention is a limited resource that is pregiven and cannot be expanded, changed, multiplied or split. There is only one mode of attention that is adequate which is focusing on a single task or object for a relatively long period. Before diving into the multiplicity of attention, a preliminary question arises: what is attention?

### 1.1 What Is Attention? Beyond a Psychological Definition

Attention is a basic and important human capability. Brain scientists Michael Posner and Steven Petersen regard it as “central to human performance” (Posner & Petersen, 1990, p. 25), and for the philosopher Yves Citton it is that which “produces . . . the *concrete realization* of . . . individuation” (Citton, 2017, p. 172). Hence, it is surprising to find out that there are many definitions for attention. Perhaps too many. Some of the confusion can be imputed to the interdisciplinary nature of the research on attention, covering not only philosophy and psychology, but also neuroscience ((Posner & Petersen, 1990); (Petersen & Posner, 2012)), gerontology (Tun & Wingfield, 1995) and cognitive studies (Green & Bavelier, 2003); (2008)). Sometimes conflicting definitions can be found within a single field of knowledge.[[1]](#footnote-1)

A common starting point for defining attention across disciplines is William James’ famous quote: “Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought” (1890, pp. 403-4). Although everybody presumably knows what attention is, James’ description yielded a mushrooming of definitions. Sebastian Watzl lists some of them:

a filtering of perceptual information (Broadbent 1958), a feature binding mechanism (Treisman and Gelade 1980), a mechanism of selection of information for action-control (Allport 1987; Neumann 1987), a general purpose resource (Kahneman 1973), a broadcasting of information to working-memory (Prinz 2005, 2011), or a bias-and-competition process (Desimone and Duncan 1995). (Watzl, 2011C, p. 844)

Watzl’s list reflects how large is the number of approaches to attention that were developed in the second half of the twentieth century. Note that most of the references (except one – Prinz) belong to the writings of psychologists who based their definitions on the guidelines drawn by James, yet each push in a different direction. It seems that psychologists are unable to agree on the definition of attention.

How can this impasse be sorted out? One possible solution is to go back in time and explore earlier notions of attention. One of the original attempts to understand attention was developed by Lev Vygotsky in the first third of the twentieth century. He coined the term “field of attention” for a mental field that is created through learning processes. Its existence enables us to perceive. This notion was later integrated into postphenomenology by Catherine Hasse as the ability to perceive, independently from the actual physical field (2008, p. 48).[[2]](#footnote-2)

At this point it is interesting to compare the field of attention to another field – Aron Gurwitsch' notion of “field of consciousness” (1964), later developed by Robert Rosenberger into “field of awareness” (2012).[[3]](#footnote-3) Gurwitsch' field of consciousness contains a theme, contexts and margins (Arvidson, 2006, p. 10), and was probably inspired by Merleau-Ponty's usage of the term field. By comparison, Vygotsky's field of attention does not contain “things” but rather is described in terms of its structure, that is built around “centers of gravity” (Vygotsky, 1980, p. 35). These centers determine the social importance of certain element to be perceived. Hasse notes another difference between Gurwitsch' and Vygotsky's fields:

Fields of awareness differs from fields of attention in so far as the former does not focus on the process of sign mediations as part and parcel of instrument mediation—and the latter does not focus on how technologies transform our perception of space. (Hasse, 2018, p. 243)

Each field type “speaks another language” so that the field of attention works through signs and the field of awareness through the perception of space. A third difference is the framing of attention in the singular or in the plural. Whereas the field of awareness grows from projects aiming at defining attention as limited to one object at a time (e.g., (Rosenberger, 2012)), the field of attention is “a whole series of potential perceptual fields” (Vygotsky, 1980, p. 36). As a set of potentials, it enables tool use (Vygotsky, 1980, p. 35). Hasse's reading of Vygotsky translates attention into a cultural and voluntary act that includes “a social relation to technology” (Hasse, 2018, p. 251). She notes that this understanding of attention was later developed into theories of distributed cognition, i.e. of multiplicity. Thus, the notion of field of attention turns attention into a condition for perception in general and to usage modes of technology specifically.

Contra the common emphasis on psychology in the studies of attention,[[4]](#footnote-4) most of the references in this book will be made to philosophy and other disciplines in an effort to sort out psychology's impasse.[[5]](#footnote-5) In philosophy, the lack of a single agreed-upon definition of attention has led some philosophers to map the existing definitions and directions. The mapping comes as (at least) two types of analyses – classificatory and historical. The former is engaged with grouping the various definitions of attention to several categories in order to show how different meanings arise, sometimes conflicting (e.g. (Friedman, 2014); (Citton, 2017)). The latter arranges the various definitions along a time scale in order to explain how the references to attention have evolved (e.g. (Wellner, 2014)). In the next section, one example of a classificatory analysis will be described, and in the section following it I shall engage in a brief historical-genealogical analysis.

### 1.2 A Classificatory Analysis of Attention

Lyat Friedman (2014) maps five definitions of attention applying a critical psychoanalytic perspective. Essentially, she offers an alternative to psychology by departing from psychoanalysis, thereby providing a fresh look at attention. It can be evidenced as early as the opening of her article where she cites Freud's recommendation to therapists not to pay attention to what patients were saying during the consultation meetings. Instead, he recommended them to notice what was usually left out and mark those “leftovers” as that which was of importance to the therapeutic process. In other words, attention in the psychoanalytic clinic should be paid to the least expected objects of attention. This is, in Freud's terms, “negative” attention. It is negative because there is an effort not to pay attention to a certain object. Complementarily, “positive” attention means that attention selects one object and focuses on it by various mechanisms. In Friedman’s mapping, three definitions of attention are “positive” and two are “negative.” This classification is not intended to be judgmental but rather to show that attention can be understood in more than one way. She fixes on three definitions of attention and analyzes them as positive mechanisms:

* **Foreground**: Attention is conceived as an undivided controllable cognitive organ, like a hand or an eye, that reacts to sensory stimuli triggered by given objects in the world or internally by the subject, and is formally prior to and a necessary condition for conscious thought.
* **Background**: Following Maurice Merleau-Ponty, attention is an active agency that creatively selects an element from the background. From the manifold of undetermined sensory data, attention provides the conditions for the cognitive mind to collect sensory components and transforms them into figures of objects that stand against the background.
* **Filter**: Attention filters out, based on either physical characteristics or semantic attributes, what can draw attention. The focus in on that which passes the filter.

The remaining two definitions are “negative” because their mechanisms involve the attention's ability to prevent and preclude certain stimuli over others. According to these definitions, attention regulates which stimuli do not pass a certain threshold and hence are excluded from cognitive processes:

* **Distractive attention**: because terminating attention is impossible, distraction is not the opposite of attention, but rather it is the attention to something else. This is probably what Freud meant to when instructing therapists to not pay attention to what the patients talk about. This is also what is demonstrated by Simons and Chabris’ (1999) famous video clip, showing the distractive effect of a surprisingly appearing gorilla for the task of counting how many times a ball is passed between a group of players. It is as if some viewers can “split” their attention and see the gorilla while counting, and others cannot.
* **Negative attention**: As an “opposed mirror” to filter, this type of attention consists of the ability to prevent and preclude certain stimuli over others. It creates a threshold of exclusion.

The first four types of attention were already discussed by philosophers and psychologists. The last one, the negative attention, comes with a surprise. It is a mode of attention that should be practiced and learned by adults. It requires some effort. Think of reading a text that you keep writing and rewriting. After several rounds, it is difficult to notice flaws in the argument and even typos. One needs a new mode of reading in order to be able to correct the text. Likewise, artists and designers indicate that they need to refrain from thinking on what they actually do in order to be creative.

By collecting definitions of attention, Friedman constructs a multi-dimensional meaning of attention that simultaneously operates on several levels and objects. Moreover, she widens the scope to include distraction as a particular mode of attention. Friedman’s mapping reveals the multiple meanings and modes of operation of attention. Likewise, the genealogical analysis in the following section will overview multiple modes of attention along a time axis. In addition to a timeline, it will add media technologies to the analysis of attention and show how attention as a notion has changed along a time axis in parallel to media technologies. The result is an understanding of how a certain mode-of-attention has become dominant through the co-shaping with media technologies.

### 1.3 A Genealogy of Attention and Technology

My interest in attention stems from the complex relations between attention and technology. As a preliminary clarification I will state the obvious: technologies do not “perform attention.” In the age of machine learning, when computers are not only capable of calculating and predicting but also creating works of art, compose music etc., thereby manifesting imagination (Wellner, 2018), attention becomes one of the few faculties that cannot be delegated to an algorithm. Technologies can assist (or interrupt), but – as Bernhard Waldenfels explains - “Attention cannot be replaced by some 'attention machine' because it can be either given or denied, not just to our cohabitants but also to things” (Waldenfels, 2011, p. 66).[[6]](#footnote-6) We cannot replace attention by a technology.

Examining the practices and technologies related to attention reveals how attention “becomes realized as historically and culturally varied *techniques and practices of attention*” (Waldenfels, 2011, p. 68). These practices are exposed through the examination of technologies. In this book, I look at media technologies as reflecting a certain mode of attention while simultaneously co-shaping that mode. I refer to modern media technologies: first the cinema, then radio and television, and lastly today's internet and cellphones. As their name implies, media technologies mediate content, but this is just part of the picture. Philosophers of technology contribute an important perspective by studying how technologies mediate the world (Verbeek 2005). I examine how media technologies mediate the modes of being attentive to contents, and term them as modes-of-attention. To this mix I add references to philosophers' understanding of attention. My aim is to show how their philosophical perspective corresponds to a prevalent mode of attention. Juxtaposing philosophical understandings of attention and media technologies will reveal how philosophers like Dewey, Husserl, or Merleau-Ponty were frequently influenced by the technologies that surround them, albeit they rarely admit that. As technologies change at fast pace, these correlations mean that our understanding of attention changes over time and cannot be considered a-historical. Attention has a genealogy.

Due to its roots in historiography, the methodology of genealogy involves a historical account of notions, linking sets of definitions and approaches to a given era (Koopman, 2013). This methodology enables me to organize the diverse philosophical definitions, modes of operation and media technologies along a time axis. When associating the definitions of attention with certain eras, it becomes clear that each era is marked by some media technologies that were invented and developed more or less at the same time. Once attention is conceived as a dynamic concept that changes over time, it becomes clear that what was true and relevant in the nineteenth century might be obsolete in the twenty-first century.

Instead of following the details of an evolutionary process, I probe the history of attention at several points, termed moments. Each moment exemplifies a specific entanglement of two variables.[[7]](#footnote-7) When Michel Foucault employed the methodology of genealogy, he intended to examine the variables of power and knowledge. My variables are attention and technology: the philosophical references to attention at a given era on one hand, and the dominant media technologies of that time and how they were used on the other. This analysis will, I hope, clarify how the co-shaping process works, i.e. how the prevalent mode-of-attention guides the development of new technologies to reflect such a mode, and at the same time, these technologies reinforce that mode-of-attention and contribute to making it prevalent.

When should the investigation commence? A starting point of a genealogy of attention can be set to Augustine and the practice of reading books silently. This early stage will serve as my “moment zero” of the genealogy. Augustine, the codex format of the book and the then-new practice of reading silently set a certain understanding of attention and shaped reading practices which are relevant even today.

After establishing the historical background, “moment one” is pinpointed to modernity and is based on Jonathan Crary's groundbreaking book *Suspensions of Perception: Attention, Spectacle and Modern Culture* (1999) in which he presents how attention was transformed in the last quarter of the nineteenth century. He chose that period to show that attention then emerged as a problem and attracted academic interest.[[8]](#footnote-8) As an academic field, attention evolved from “a marginal, at best secondary problem within the explanations of mind and consciousness” (p. 18) into an important research arena. The new approach referred to attention as a problem thereby forming a sharp contrast to previous research that had a neutral attitude towards this faculty. Crary stresses “the unmistakable discontinuity between the problem of attention in the second half of the nineteenth century and its place in European though in previous centuries” (p. 19).

The new academic interest in attention of late nineteenth century was colored by a deep negative tone that positioned inattention as a problem. Even the definitions of attention were phrased in negative terms like “exclusion” and “unperceived” (pp. 24-25). A century later, mainstream research throughout the second half of the twentieth century still studied attention as a “natural function” whose malfunctioning such as ADD is considered a mental problem (see (p. 35)). Thus, an important achievement of Crary is his critical view with regards to the blindness to the social construction of certain behaviors. Whereas Crary's work highlighted the negative bias in such research, Friedman's mapping of negative types of attention can be regarded as an attempt to “cure” the negative bias. Her solution simply positions the negative modes of attention as complementing the positive ones.

Crary imputes the shift in the positioning of attention as a problem to the rise of large-scale industrial technologies which necessitated the development of new policies. Some of these policies had to deal with the attention of the workers who were handling the factory machines. The workers faced difficulties to remain attentive to the monotonous labor for long hours, and frequently their mind wandered elsewhere. The factory's management regarded this reaction as a human deficit rather than a sign for a bad interface design. The burgeoning academic research defined it as inattention or distraction and considered it a negative behavior. Consequently these effects “began to be treated as a danger and a serious problem, even though it was often the very modernized arrangements of labor that produced inattention” (Crary, 1999, p. 13). The negative tone drifted from the employment arena to other fields of human activity such as education. Accordingly, education systems were designed so that pupils were expected to sit still for long hours in school, even if the teaching materials and methodologies were simply boring. If they expressed boredom, it was interpreted as distraction, i.e. lack of attention, i.e. a problem.

It is not simply the rise of large industrial systems that led to the positioning of attention as a problem. Inattention was assigned to low-waged workers and children thereby reflecting the power relations in society (p. 29) and thereby reinforcing those power regimes. The same logic refused to acknowledge quilting as an art, as its design was frequently performed while being busy with the house chores (Showalter, 1991).

Crary provides additional explanations for the scholarly interest in attention: First, attention could become a central area of academic research also as a modernist scientific endeavor. Thus, attention research set as its goals the pretention to control (human) nature and improve it. In this framework, attention was considered as something that can be altered with the right scientific methodology. Furthermore, the new approach to attention is fed from the erosion in the subject-object dichotomy, and at the same time reinforces it. We no longer refer to a subject that perceives and an objective world that is perceived. Instead, there is “a shifting and intervening space of socially articulated physiological functions, institutional imperatives, and a wide range of techniques, practices and discourses relating to the perceptual experience of a subject in time.” (pp. 44-45).

To Crary’s description of the large-scale industrial machines, I wish to offer a postphenomenological insight. I suggest adding references to media technologies and show how they co-shape the modes of attention, thereby leading to a mutual transformation process of technologies and attentions. It is not a coincidence that the cinema was invented during that period. The cinematic experience was shaped so that spectatorship was sedentary in a dark hall. The gaze of the viewers was attracted to the large illuminated screen in front of them. All this was designed to ensure that the viewers concentrate on the movie and will not move their bodies. The cinema has functioned from its very beginning as an “attention machine,” optimized to capture the viewers’ maximal attentions and minimize inattention to zero.

“Moment one” in my genealogy marks the intersection between cinema as a media technology and the figure-background mode-of-attention. According to this mode, the figure is the object to which attention is directed, and the background is simply all the rest. Thus, the machine's factory, the teacher in the classroom and the cinema screen are positioned as something to which one must pay full attention and ignore all other things and thoughts.

Crary’s analysis ends at the beginning of the twentieth century and serves as the starting point of modern attention. My genealogy continues from that moment and locates the second moment in the mid-twentieth century, with the introduction of multi-channel radio and later multi-station television. Here the prevalent mode of attention transforms into a scanning and fast switching of foci, from one broadcasting station to another. Like the cinema, mid-century mass media was mostly consumed while sitting and preferably being attentive to the broadcast content. Now instead of attention-distraction and figure-background dichotomies, attention switches at fast pace between several objects. Attention functions like a single ray of a searchlight that browses the surface superficially, as Merleau-Ponty (1962) criticizes. When Internet surfing practices developed, the critical vocabulary of fast switching was already in place, after being developed in the era of television.

My third step begins with the emergence of the internet to the homes at the end of the twentieth century, especially its associated practices of browsing and hyperlinking. It accelerates in the 21st century, with the rise of the cellphone as the dominant media technology, bringing new practices of multi-attentions. Conceiving attentions in the plural is a relatively new research insight (see (Petersen & Posner, 2012); (Watzl, 2011A); (2011B); (2011C); (2017); (Wehrle & Breyer, 2016)). I developed my concept of multi-attention through a postphenomenological analysis of situations such as talking on the cellphone while driving a car (Wellner, 2014), playing on the cellphone during lectures as a means to remain attentive and mindful to the content of the lecture, or watching television during a dental treatment. Furthermore, many video and computer games require the users to split their visual attention ((Green & Bavelier, 2003); (Green & Bavalier, 2008)). Think of computer games like “Fruit Ninja” where the users need to spot virtual objects emerging from two (or more) spots simultaneously.

The concept of multi-attention has become relevant also to activities that are considered “technology-free” such as crossing a street or playing football. Likewise, elderly people need to invest some efforts to pay multi-attention in everyday situations like talking to other people while washing the dishes, walking while having a conversation with someone etc. (Tun & Wingfield, 1995). Moreover, they are more likely to get hurt if they keep their attention focused on a single object or act. For instance, when walking in the street, they should pay attention to the act of walking (more difficult if you need a cane), AND to obstacles on the sidewalk AND to other people in the street. Conceiving such everyday practices in terms of multiple attentions can assist elderly people to walk safely, drivers to drive better and young adults to maintain a full rich life. In all these activities attention is paid to more than a single object.

The emergence of multi-attention practices has led critical scholars to praise the nineteenth century’s mode of attention as the only legitimate mode (see (Carr, 2010); (Stiegler, 2010); (Citton, 2017)). My principle aim in this book is to show that attention can be usefully conceived in the plural thereby reflecting a human capability to deal with several objects or processes that are dynamically kept at various degrees of clarity and focus.

### 1.4 The Book’s Layout

The first part of this book describes how the notion of attention has evolved from the late nineteenth century to today.[[9]](#footnote-9) It provides a genealogical analysis of attention focusing on the modern meaning of attention as it has been developed since the last quarter of the nineteenth century. It is composed of four chapters, each devoted to a genealogical “step.” Each assumes a certain common mode-of-attention, rooted in a specific era and characterized by specific media technologies that co-shape attention. Each mode of attention has its distinct metaphor-model and a set of phenomenological literature.

Chapter 2 covers “moment zero” of Augustine's reference to attention, the invention of the codex book and the rise of the practice of reading silently. It will provide a background to moment one.

Chapter 3 details “moment one” thereby entering into modernity. The dominant mode of attention assumes one has to concentrate on an object in the foreground and ignore the rest by putting it in the background. It is modeled by John Dewey’s lens metaphor that depicts the concentration of light and heat in a single point (Dewey, 1967, p. 119); cf. (Crary, 1999, p. 24); (Jennings, 2012, pp. 538-541)). From a technological perspective, the metaphor covers modern media consumption practices of the late-nineteenth century such as listening to gramophone music or watching a cinematic film both requiring the full attention and a single focus (albeit the roots can be identified in the medieval reading practices).

In Chapter 4, I describe the mode-of-attention which is conceived as a ray of light that switches quickly between objects. This mode of attention is represented by the searchlight metaphor and is rooted in the works of Edmund Husserl and especially his terminology of “the glancing ray of attention” (Husserl, 1999, p. 285).[[10]](#footnote-10) The relevant technologies are multi-channel radio and television that require “hopping” and “zapping”, i.e. switching the attention from one station to another. Historically this moment is located in the mid-twentieth century.

Chapter 5 depicts a relatively new mode-of-attention and conceives attentions in the plural, or in short – multi-attention. The theoretical foundation is Don Ihde’s postphenomenological notions of multistability and pluvicultures on one hand, and the notion of schizo by Deleuze and Guattari on the other. The metaphor for it can be Watzl’s (2011B) example of a jazz band: One can carefully listen to the piano but still hear the drums and the saxophone. This third mode of attention is accomplished in the twenty-first century’s computational multi-tasking technologies. Whereas multi-tasking on the technological side is considered as advanced, when it comes to humans it is seen as either a trait of gifted persons like pilots or day-traders, or a bad habit of minorities, mainly women and children. Multitasking has been considered “mission impossible” by many, especially those who preach for the first mode of attention of focusing and concentration. Technologies like the cellphone not only function via multi-tasking, they also enable it for their users. For instance, the cellphone enables talking while driving (as will be described in Chapter 6).

The following table summarizes the modes of attention, the related media technologies and models that explains them:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Time | Prevalent media technology  | Modus operandi  | Model/ metaphor | Key thinker(s) |
| Moment zero | Late antiquity | Book | Meditation | - | Augustine |
| First moment | Late nineteenth - early twentieth century  | Cinema  | Focus | Lens | Dewey |
| Second moment | Mid- twentieth century  | Multi-channel TV, radio  | Fast switching  | Searchlight  | Merleau-Ponty |
| Third moment  | Twenty-first century | Internet, cellphone  | Multiple | Jazz band | Ihde, Deleuze & Guattari |

Table 2: Modes of attention

The second part of the book consists of two chapters discussing the problematics of attention in the 21st century. Chapter 6 depicts the debate on the safety of driving while celling: is it safe to talk on the cellphone while driving? Unlike texting that requires the user’s-driver’s gaze, talking involves speech and hearing. Yet, cellphones are blamed for distracting drivers’ attention, even though driving in itself requires multiple attentions. In this chapter I favorably view celling while driving with the assistance of the notion of multi-attention. I show that attention can be paid to several objects. Phenomenologically, drivers must pay attention not only to the mere act of driving i.e. operating the car, and not only to the outside where there are other cars, road signs and road conditions, but also to the inside of the car where the passengers reside, may they be children, adults or Beagle dogs ((Irwin, 2014); (Michelfelder, 2014)). In addition, drivers also need to pay attention to the technologies in the car, like the radio and the navigation system. In such a complex environment, it seems to me that the cellphone is just the latecomer to the party. Thus, the cellphone serves as a typical example to the usage of contemporary technologies that enable, support and encourage multi-attention. This is the cellphones' technological intentionality, and we can accommodate ourselves to using these new technologies. Following Catherine Malabou's phenomenology of the brain (2008), it is argued that that we can re-wire our brains, because the brain is plastic, that is—highly flexible in its ability to adapt to various forms of technologies, situations and experiences, such as celling while driving.

The last chapter (Chapter 7) offers an unorthodox response to the attention economy. Originally described by Goldhaber (1997), attention economy regards attention as a scarce resource that is the subject of the exchange in the Internet’s “barter” mechanism of contents, advertisements and fame. This exchange means that the users-viewers “pay” attention to content with the currency of “eye balls.”[[11]](#footnote-11) Hence, visiting a website is conceived as a transaction of “eye balls” as emblems of paying attention on one hand, and content and advertisements on the other. Critical theory recommends fighting back the capitalistic regime of advertisements by focusing the attention on a single object. This is the approach of the *OnLife Manifesto*. But focusing means playing according to the attention economy’s rules, and its resistance effect on the users might be slim. My recommendation is to subversively practice multi-attention by allocating a very small amount to the advertisements, enough to please the advertisers, allowing the viewers to invest larger attention in other objects or topics. Multi-attention offers a potentially effective response to the attention economy.

# Part 1: A Genealogy of Modern Attention

## Chapter 2: Attention While Reading a Book

### 2.1 The Bound Book

Augustine of Hippo (354-430) lived in interesting times. The 4th and 5th centuries saw the rise of Christianity as well as the distribution of a relatively new book technology, that of the bound book, also known as the codex. Only a few centuries before, the early Christians quickly adopted the codex book technology as it enabled them to easily carry around their texts in a small format. When they eventually opened the books and read, it was likely to be in private and in silence, to avoid being caught by the authorities. Although Augustine does not refer specifically to the bound book technology, it is implicitly present in his works.

The codex emerged in the second century ((Petroski 1999, 30); (Stock, 2008)). Guy Stroumsa (2012) defines the shift from rolls to bound books as “nothing less than the most dramatic event in the history of the book in the western world until Johann Gutenberg’s commercialization of printing . . . in the mid-fifteenth Century” (p. 153). The codex was revolutionary in several aspects: First, it enabled readers to “jump” directly to the desired page, bypassing the need to scroll and read linearly; Second, more text could be written because both sides of the papyrus or parchment could be used; And third, the reading of the codex freed the hands which struggled to keep the roll open. For contemporary book readers, the first aspect seems the most revolutionary, as it may remind us of the Internet revolution and hyperlink technology. For Augustine and his contemporaries, the second and third aspects were no less important.

Once the codex technology enabled writing on both sides of the leaf, the books became smaller, lighter and cheaper (in terms of raw materials for its production). The early Christians were fast to adopt this technology, for its lower costs of production and the reduced size of the books that made it easier to conceal the forbidden texts. Thus, the shift in technology paved the way for books that could be easily carried around and hidden from the authorities when their carriers were outlawed for religious reasons. These early books “were not meant for cultic display” (Stroumsa 2012, 153). They were intended for private use.

Another important parameter was the ability to free the hands while reading the codex. This novel format facilitated a meditative form of reading that was based on repeating a given passage. The attention was no longer divided or diverted to the technicalities of keeping the roll open and scrolling. Consequently, the reader could now focus on the reading of the text itself, as a single activity to be performed. Interestingly, Augustine did not discuss the change in the physical appearance of the book from scroll to codex. He was interested in the mere act of reading.

### 2.2 Reading and Silence

The new book technology coincided with the slow emergence of the practice of silent reading ( (Stock, 2008); (Stroumsa, 2012); cf. (McCutcheon, 2015)). In this juncture, Augustine appears as a unique scholar who elucidated the act of reading. A systematic analysis of Augustine's theory of reading can be found in Brian Stock's book *Augustine the Reader* (1996) where he heralds Augustine as a scholar whose “design for reading is one of the distinguished intellectual achievements of his time. He tells us more about the subject than does anyone else in antiquity” (Stock 1996, 2).

Augustine seems to be committed to what was considered the prevailing practice of reading aloud, and hence was interested in the question of the relations between reading and voice, and specifically how “what is written (*ta graphomena*) represents the sound” (p. 139). He understood reading as a matching between a letter and a specific sound, so that “in reading, a sign, presented to the eyes, brings to mind a group of syllables as heard” (p. 161). The oral reading practice as described by Augustine resembles that of those who learn how to read, as they have to concentrate on deciphering the letters into syllabi and words. Today it is clear that silent reading is more fluent and enables the reader to concentrate on the meaning of the text. But these aspects do not appear in the *Confessions* as Augustine regarded silent reading as an unusual practice.

Beyond the technicalities of deciphering the letters into words, reading for Augustine was a religious and meditative act. For him, reading was meant to be repetitive, like a “constant prayer” (Stroumsa 2012, 156). The meditative-attentive aspect is intensified in silent reading. In the Roman world, however, reading silently was considered an unusual practice, amounting to “magic or sorcery” ((Stroumsa 2012, 152); see also (Manguel 1997, 43-44); for another approach see (McCutcheon, 2015)). It was so unusual, that Augustine devoted to it only a short passage in the *Confessions*, colored by a sense of wonder and puzzlement. He described this practice while detailing his meeting with St. Ambrose of Milan.

Now, as he read, his eyes glanced over the pages and his heart searched out the sense, but his voice and tongue were silent. Often when we came to his room, . . . we would see him thus reading to himself. After we had sat for a long time in silence—for who would dare interrupt one so intent?—we would then depart, realizing that he was unwilling to be distracted in the little time he could gain for the recruiting of his mind, free from the clamor of other men’s business. (*Confessions*, 6.3. 3)

It appears as if it was the first time Augustine witnessed someone reading to himself silently. He was so surprised by this behavior that he provided two possible explanations: first, that someone might hear St. Ambrose reading and may ask questions thereby preventing St. Ambrose from reading the amount of text he planned to; second, and an “even a truer reason for his reading to himself might have been the care for preserving his voice, which was very easily weakened” (ibid, ibid). Augustine does not mention the historical justification, according to which the habit of reading silently was rooted in the days when the early Christians were hiding their religious practices. Moreover, as someone who reads aloud, Augustine was probably not aware of how faster silent reading could be.

Augustine's approach to silent reading is of a surprise but not of negativity. He held a positive attitude toward silence itself. Stock links several texts of Augustine to compile his approach to silence:

Augustine compares silence to sound as the darkness was to light when God created the world. He believes that the silences in biblical texts kindle our interest in topics on which they do not explicitly speak, such as the nature of the soul. He contrasts the sensory appeal of music with the silence of truth, which steals into our hearts and invites us to seek the blessed life. (Stock 1996, 7)

Silence is the way to what we call today meditation and from Augustine's and his contemporaries' perspective - a link to God and Truth. Indeed, silence has been a major virtue in Christianity from its beginning. It has maintained its centrality in the middle ages, as monasteries carried out meditative reading comprised of silence, solitude, and a focus on the interiority (See (Stock, 2008, p. 390)). Some of these communities still exist.[[12]](#footnote-12)

From a broader perspective, the religious practice of silence, including silent reading, was a form of subjectivation. This, in a nutshell, is the argument of Michel Foucault in *The Hermeneutics of the Subject* (2001) where he studied the early Christian monks. He connected three elements in the life of monks in late antiquity: listening, reading (and writing), and speech (i.e. confession). As part of his investigation of early Christianity's acsesis, he showed how all three elements were related to meditation, truth and a specific mode of subjectivation. This work is part of a larger project of Foucault in which he examined what he called “technologies of the self.” In this project, he explored

techniques which permit individuals to perform, by their own means, a certain number of operations on their own bodies, on their own souls, on their own thoughts, on their own conduct, and this in such a way that they transform themselves, modify themselves, and reach a certain state of perfection, of happiness, of purity, of super natural power, and so on. (Foucault 1997, p. 181)

Reading and silence are thus bodily techniques, which are designed to lead the practitioners to a certain belief, a way of thinking and even a mood. It is a way of becoming a subject, of subjectification.

Foucault was interested in analyzing how these habits operated with “techniques of domination,” namely "the techniques which allow one to determine the behavior of individuals, to impose certain wills on them, and to submit them to certain ends or objectives" (1979, p. 180). Foucault noted that governing people was not simply equal to power and force but rather “a versatile equilibrium” (1979, pp. 181) between imposition and coercion on one hand and technologies of the self on the other. Foucault showed how our current subjectivity is rooted in practices developed in late antiquity and that the ways in which we “manage” ourselves are not a modern invention.[[13]](#footnote-13)

The reading habits of early Christianity can be analyzed through the lens of self-management, intended to ensure that the reader is absorbed in reading, and through the reading – in thinking of God. From this historical perspective, reading and silence are technologies of the self that were developed in late antiquity and have remained to this day as a mark of concentration. As a technique of domination, it is a mechanism that dictates a proper behavior to those who are subordinated to the power. That is why pupils are expected to sit quietly in a classroom.

Whereas Foucault is interested in technologies of the self, self-transformation, and their relation to power, I am interested in attention and its relation to technologies. Attention is part of those “technologies of the self,” as well as part of “techniques of domination,” as will be demonstrated later in this book with the contemporary pursuit after the ideal mode of attention. The next two sections detail how the link between reading and silence is further complicated when the notion of attention is involved.

### 2.3 Augustine's Understanding of Attention

Stock focuses on the reading theory of Augustine, and attention is implicitly present in his discussion. For example, when he ties between the senses and the reading, he states: “Hearing differs from listening, seeing from looking: only the latter pair provides the basis for the word recognition” (Stock 1996, 13). Reading requires attention. Yet, the role of attention is wider than that. Deborah Brown (2007) examines Augustine's approach to attention. Collecting insights across Augustine's works, she combines an almost complete theory of attention, according to which attention is “the gaze of the mind” (p. 164) that unites senses and memory into perception.

In *de trinitate*, he defined attention as “the power that fixes the sense of sight on the object that is seen as long as it is seen, namely the attention of the mind” (quoted in (Brown, 2007, p. 161)). Augustine conceived attention as an active and voluntary state, because it could be activated at will. This aspect of activeness is exposed in Augustine's *Confessions* by phrases like “I directed my attention to…” (*Confessions* 7, 3.5). Compare the selection of the verb “direct” to attention economy's choice of verbs, like “pay,” in which the action is receptive and less active. For Augustine attention was an active and voluntary performance of directedness, and not a response to some external call to look, hear or buy. His interest in attention can be explained by the religious motivation to self-control. i.e. regulate the bodily behavior (Brown, 2007, p. 162). Thus, for Augustine, attention is a voluntary controllable function of the mind that eventually enables the mind to control the body. Brown's analysis reflects the scholarly understanding that attention for Augustine is an active state of consciousness that relates to the senses and the subjective time ((Crary 1999); (Silva 2014)).[[14]](#footnote-14)

Although Brown does not refer to reading, her findings on Augustine's approach to meditation can be instructive. In meditation, the mind is actively “attending to itself” (p. 166) seeking truth and knowledge. She carefully suggests that Augustine regards knowledge is equal to illumination (p. 166). Yet, knowledge should be understood here as rooted in an “inner Truth” (p. 165) and not as the result of sensing the outside world. Consequently, attention, meditation and learning are all states of “illumination.” Although reading is not mentioned, it can be easily added to the list.

Lastly, Brown notes that the lack of attention is less clear in Augustine's texts and can be understood as distraction or divided attention (pp. 164-165). This absence of explicit reference fits very well Crary's argument that attention in the form of distraction became a problem only in the late nineteenth century.

### 2.4 Attention and Reading

When Augustine defines attention as an active state that occurs in the present, this definition does not help us to understand how attention functions. An understanding of its operational logic can be obtained by examining reading as paradigmatic to acts that require attention. It is helpful to examine reading once it transformed, and such a change occurred in the days of Augustine. In that period, reading slowly transformed from oral to silent reading, and from a practice performed in public and aloud, to an act executed in private and in silence. This changeover is reflected in Augustine's sense of surprise that “colors” the description of St. Ambrose's reading habits. Stock asserts that what impressed Augustine was “the silent decoding of written signs as a means of withdrawing from the world and of *focusing attention* on one's inner life” (Stock 1996, 61-2; emphasis added). It was a new way of being attentive, that equated between focusing and meditation.

This meditative logic has been ruling reading ever since. Obviously, today's logic of reading is different: reading is meant to produce knowledge. Yet, what unites the two reading practices - in spite of the gap of more than 1500 years - is the wish to control attention and shape it in a certain way.

Two scholars provided detailed accounts of these shifts as they were experienced by Augustine: Stock focused on Augustine's understanding of reading and Brown on his understating of attention. Combining the two analyses illuminates the missing link between reading and attention and generalizes this link as applicable for contemporary oral and silent readings. In both cases, recognizing words requires attention on the text and “a 'distending' of thought” (Stock 1996, 2, 13). Reading is meant to allow the reader to perceive God, and hence is considered meditative in today's terms. This state of mind can explain why for Augustine reading requires “solitude of intention” (Stock 1996, 62). Intention here is understood as the ability to gather the mind. Thus, an equivalence is established between attention and intention (Brown, 2007, pp. 160-161).

To this intertwining of reading and attention I would like to weave in another thread, that of the technology. This chapter was opened with a description of the new book technology of the codex. Although Augustine does not refer to physical book, the technology provides a background for the transformation in reading. The two shifts, from scroll to codex and from loud to silent reading, can be regarded as a co-shaping of the bound book and an attentive reader, so that one influences the other. Their combination could explain the rise of a new mode of attention. Unlike today's technological changes that can be spotted within a few years, the shifts from scrolls to codices, from loud to silent reading, and from active attention to focusing-mediating – all occurred slowly during several centuries and hence cannot be easily detected. The proximity in time of the three processes as indicated in this chapter may pave the way for a detailed historical research that may prove or refute this hypothesis.

Based on the already existing research, attention as exercised in reading becomes part of a larger goal, of “controlled interiority” (Stock 1996, 63). In Foucauldian terminology, attention as reading is a "technique of the self" that emerged in early Christianity. This technique of the self has been lasting for centuries. We find it in modernity, the form of reading silently in a quiet library. Such a reading is based on a mode-of-attention that filters out any unnecessary sensorial stimulus, thereby directing the attention of the reader exclusively to the content of the book. In this mode-of-attention, one is either attentive, or not (see (Brown, 2007, p. 165)) and hence attention is conceived as a dichotomy. Thus, Augustine's concept of attention has remained relevant even in the nineteenth century. When Crary brings Bergson's attitude to attention the meditative aspect becomes evident: “Bergson wanted an impossible attentive concentration, an absorption that would never lose its conscious connection to the willed activity of the body” (Crary 1999, p. 325).

## Chapter 3: Attention as a Focusing Lens

### 3.1 Cinema as an Attention Technology

The cinema is the “poster child” media technology of the nineteenth century. The family of media technologies was developed throughout the nineteenth century and aimed at innovating in the sphere of visual and auditory perception: photography (1813), the phonograph (1877), the Kaiserpanorama (1881), the gramophone (1887), the kinetoscope (1894), and lastly – the cinema (1895). All these inventions were members of the “industrialization' of visual consumption” (p. 138). [[15]](#footnote-15)

These technologies and their related practices require a quiet environment, preferably dark, with no interruption or stimuli. Sitting in a cinema hall, the film is in the foreground, and the background should ideally remain silent and unnoticeable in order not to distract the viewers’ attention. In other words, the design of cinema halls as dark rooms where people should remain sedentary and quiet reflects a certain mode-of-attention. At the same time, such a setting reinforces the legitimacy of the focusing mode-of-attention and marks those who have difficulties with this mode as exceptions.

The cinema “industrialized” perception by combining image and sound into mass-duplicated experiential arrays (Stiegler, 2011). Not only the film itself, but also the technology of the film contributes to the industrialization of perception. The technology of screening requires a specific setting of a dark hall. Inside the hall, the viewers are “industrialized”: as they are requested to sit in lines, all facing the same direction, towards a large screen on which the movie is shown. Once the film starts rolling and playing, all the gazes are mesmerized to the illuminated pictures that combine the movie. Moreover, by using editing techniques like zoom in, the film director can fine tune the viewers' attention and direct it to a certain character, scene or detail. This complex setting led me to regard the cinema technology not only as the “industrialization of perception” as Crary (1999) suggests, but also as a form of mechanizing attention. The cinema is an attention machine that manages and regulates the viewers' attention.[[16]](#footnote-16)

The cinema’s ability to “standardize” and regulate the attention of the viewers was intensified with the addition of sound to the silent movies. Crary (1989) details how the addition of auditory perception changed the way cinema has been consumed, turning it from an optical illusion to a fuller experience that “instituted a more commanding authority over the observer, enforcing a new kind of attention” (102). Crary does not take into account the full experience early cinema consisting of sitting in a dark cinema hall and the embodiment relations imposed on the viewer who had to (a) sit, (b) face the screen, (c) see only the screen as the hall is darkened.[[17]](#footnote-17) From the perspective of bodily experience, the cinema has - from its beginning - “disciplined” the viewer’s body by directing it towards a sedentary position. This bodily position was not a new invention. It was well rooted in the then-existing media consumption practices, such as music and theater (which are still consumed in this way even nowadays). Well trained adults were expected to sit silently in concert and cinema halls and hide any sign of boredom or discomfort. They were obliged to focus their attention on one single activity. When this practice was imported to the motion picture, it led to a shift from peripatetic exhibitions to film theaters where sitting was the conventional practice.

However, cinema was not always regarded as a tool for controlling attention. In 1936 Walter Benjamin in his seminal “The Work of Art in the Age of Mechanical Reproduction” contrasted between concentration and distraction as “polar opposites” (Benjamin, 1969, p. 239). For Benjamin these poles are mapped into habits of well-educated people vs. the masses: “the masses seek distraction whereas art demands concentration from the spectator” (ibid). This mapping fits into Crary’s observation how attention turned into a problem. The cinema is on the side of the problem, i.e. of distraction. Benjamin asserts: “The film . . . put[s] the public in the position of the critic, but . . . at the movies this position requires no attention. The public is an examiner, but an absent minded one” (pp. 240-1). Benjamin claims that in the movies, no attention is required. His view can be translated into the passive-active mapping, according to which cinema does not require active attention, as the viewers let the producers of the film to lead their attention along the movie.

From our contemporary position, the cinema reflected the media consumption habits of the nineteenth century and reinforced the mode of attention that praised concentration on one single object.

### 3.2 Figure-Background

The figure-ground mode of perception-attention was communicated in the works of the Belgian artist Fernand Khnopff (1858-1921). In “Portrait de Mademoiselle Van der Hecht” (1883) (see Figure 1), the face of the little girl is clear and sharp, whereas her clothes, her hair and the chair she sits on are blurry. The background is even blurrier to the point it becomes abstract. This composition leads the viewer to concentrate on the face and leave all the rest in the background.

In the same year Khnopff also paints “Listening to Schumann”, depicting a woman sitting in a living room near the hearth, her face partially covered with one hand. The viewer can understand that her eyes are closed in an effort to concentrate. To what does she pay her full attention? The answer lies in the top left corner where a piano is painted with the hand of the player and a sheet of notes. As the title of the work indicates, she is listening to Schumann's music. The scene depicted in the painting captures the auditory attention by visual means: sitting with closed eyes, leaning forward and being alone (except for the piano player). The two works of art described here, as well as others works of Khnopff’s, capture the visual cues of the focusing function of attention thereby reflect the socio-cultural conventions of the *fin de ciècle*.

Figure 1: Portrait de Mademoiselle Van der Hecht

A similar mode of attention is required to watch a film in the cinema. The difference is that the cinema comes with “accessories” which “force” this mode of attention. From its inception, cinema as a technology necessitated a dark room where light on a screen managed the viewers’ gaze, thereby attracting their full attention.[[18]](#footnote-18) Everything becomes background to ensure that the film occupies the foreground.

The figure-background was also dominant in academic research. William B. Carpenter, one of the influential physiologists of mid nineteenth century, explained the figure-background model from a normative perspective:

It is the aim of the Teacher to fix the attention of the Pupil upon objects which may have in themselves little or no attraction for it . . . the habit of attention, at first purely automatic, gradually becomes, by judicious training, in great degree amenable to the Will of the Teacher, who encourages it by the suggestion of appropriate motives, whilst taking care not to overstrain the child’s mind by too long dwelling upon one object (*Principles of Mental Physiology*, 1886, pp. 134-5); quoted in (Crary, 1999, p. 63)).

Although the figure-ground model was dominant, it has been contested already at the end of the nineteenth century. Crary mentions the scientific research on the nervous system that eroded the dichotomy by showing how the periphery of the eye can detect movement (1999, p. 295). But in psychology, such conclusions are still regarded heretic. The figure-background model is still in use nowadays (e.g. (Wehrle & Breyer, 2016)).

### 3.3 The Lens Metaphor

In the late nineteenth century, perception and attention were regarded as two facets of the same phenomenon, in which attention filtered out and obscured some of the perceptions.[[19]](#footnote-19) The “twins” perception-attention are not identical though, and the two research programs have slowly separated: “The very uncertainty and vagueness about the nature of attention was as indication of the obsolescence of older theories of perception” (Crary, 1999, p. 44). In this process, perception was no longer considered “objective” and it became “subjective” as attention had been conceived as a filter. This process can be viewed as a modernist paradigm that artificially isolates a single sensory input and leave aside all the other sensory stimuli. Under this paradigm, the role of attention was conceived as a filter that selects from the flow of stimuli only one object which should arrive to consciousness.

The rise in academic interest in attention at the late nineteenth century preceded the invention of the cinema. When cinema became available to the masses, attention has already been established as a research program in various disciplines, accompanied by the metaphor of the lens. It was probably selected for its a central role in visual media technologies, from photography to cinema, as that which concentrates. One of the well-known references to the lens in the context of attention is provided by John Dewey in his book *Psychology* (1886):

In attention we focus the mind, as the lens takes all the light coming to it, and instead of allowing it to distribute itself evenly concentrates it in a point of great light and heat. So the mind, instead of diffusing consciousness over all the elements presented to it, brings it all to bear upon some one selected point, which stands out with unusual brilliancy and distinctness. (p. 134, quoted in (Crary, 1999, p. 24))

Attention is paralleled to a force that concentrates light and heat, thereby equating between attention and concentration. The lens metaphor thus conveys the message of a single object that gets all the attention of the viewer. A few years later, William James (1890) defines attention as concentration. Its major component is the elucidation and focusing effect, which carries a strong resemblance to the lens metaphor. It seems as if James was inspired by Dewey. In both definitions, attention is characterized as an act of focusing on one object. All the rest should be ignored. When any other object is ignored, the processing is simplified. Thus, attention is regarded a necessary mechanism to avoid “potentially disruptive forms of free association” (Crary, 1998, p. 478). Focusing hampers free association and subversiveness.

Crary's overview of the state-of-the-art attentional research of late nineteenth century reveals a concept of attention that is equal to concentration on a single object, leaving all other perceptions in the background. Focusing on another object was conceived as distraction. Dewey and James well represent the Zeitgeist of their time. Their definitions of attention were well planted in the common discourse of the time.

Attention is defined by its opposite – the distraction. Distraction is a broad term that can encompass daydreaming, or any activity that is not socially regulated. Only recently daydreaming was acknowledged as a process separated from distraction (Dario & Tateo 2019). Defined as “mind-wandering” the researchers stress that it is a psychic process rather than an attention deficit or a compensation for boredom. It is a complex mental experience in which several aspects of body-mind and social interaction converge into elaborated meaning-making processes.

The dyadic structure of focusing-distraction has been ruling at least until the mid-twentieth century. For example, Maurice Merleau-Ponty in his book *Phenomenology of Perception* (1962), takes James’ elucidation effect as a departure point. Merleau-Ponty writes, “to pay attention is not merely further to elucidate pre-existing data, it is to bring about a new articulation of them by taking them as *figures*” (p. 30). Merleau-Ponty explains that taking an object as a figure is active in the sense that it forms “a passage from the indeterminate to the determinate” (p. 31). This is exactly what a lens does.

However, the lens metaphor is of limited use. The difference between a human and a lens is that in humans (i.e., in the case of attention) the movement from the indeterminate to the determinate creates “a new way for consciousness to be present to its objects” (p. 29). This is a creative force because attention – according to Merleau-Ponty – “creates for itself a *field*, either perceptual or mental, which can be ‘surveyed,’ in which movements of the exploratory organ or elaborations of thought are possible” (p. 29). Merleau-Ponty's construct of the field conveys the feeling of wandering in any direction, of a free movement in space. Wandering north in one field is not similar to wandering in the same direction in another field. That is why each “round” of attention produces distinct effects of the very same object. The field is also a place-holder for the context which is produced for the object of attention. Put in a simpler way, attention gives a new context to our perceptions and thoughts. This may explain why we may experience the same object differently at different times and how we notice different details each time we “visit” an object. With such an understanding of attention, the target object is no longer pre-formed or pre-given but rather a “horizon” of potential new understanding of reality (p. 30).[[20]](#footnote-20)

### 3.4 Transformations of the Lens Metaphor

The lens was the central metaphor used for conceptualizing how attention works. The major side effect of the lens is the division of the visual field into two parts – one which is seen in great details, and the other consisting of all the rest. Consequently, “attention implied an inevitable fragmentation of a visual field in which the unified and homogenous coherence of classical models of vision were impossible” (Crary, 1998, p. 479). The next philosophical development focuses on the resulting division between figure and ground. Specifically, the center point of attention is the figure that stands against the background.[[21]](#footnote-21)

Sean Dorrance Kelly (2005) reads Merleau-Ponty’s notion of attention through the prism of background and foreground. What is seen and experienced as a figure over a background is the object of attention. He explains, “to look at an object is just to see it as the spatial center of focus onto which all the objects surrounding it converge” (2005, p. 92). For Kelly, paying attention means focusing on an object. But his model does not fully conform with the lens metaphor. The difference is that here the focus creates an experience of not only the foreground's figure but also of the background's objects. The background objects “are experienced as stand-ins for the point of view one gets on the focal thing from the position in which they sit” (p. 91). He reinterprets Merleau-Ponty's duo of determinate-indeterminate into a foreground-background pair. What is at the foreground is, according to Kelly, determinate, and what is at the background is indeterminate. The latter is the opposite of the former, so that determinate is “roughly those features for which I have sense data,” and indeterminate is “roughly, everything else” (p. 78).

In an effort to reach a deeper understanding of the background, Kelly further distinguishes between “indeterminate as a perceptual absence” which he imputes to Husserl and “indeterminate as a positive presence” that is imputed to Merleau-Ponty (p. 80). The difference is that for Husserl the background is not yet seen or determined, whereas for Merleau-Ponty one can see the indeterminate (p. 81). Husserlian background can become a foreground if attention is invested in it so that the content of the background is turned into an object for the consciousness. For Merleau-Ponty, however, the background contains itself and does not require any further elaboration. It exists on its own.

To sum up, Kelly reinterprets Merleau-Ponty’s approach to attention as a perception of both the foreground and the background, accompanied by an awareness given mostly to the figure and to a lesser extent to the background setting. These two levels of attention practically move the argument from a dyad of determinate-indeterminate to a triad of figure-ground-world, where the world is the non-perceivable parts of the background.

A mix of a dyad and a triad can be found in Dan Zahavi's writing on reflection and attention. In some discussions he presents a dichotomy of figure-ground ((2005, p. 90); (Thompson & Zahavi, 2007, p. 74)) or uses the term fission (Zahavi, 2005, p. 91) which has an implicit meaning of a split into two parts. In other discussions, he surpasses the figure-ground dichotomy by maintaining a three-level structure of (a) *thematic awareness*, where attention is given to an object; (b) *marginal awareness* where attention is drawn to the surroundings; and (c) the unattended rest-of-the-world (2005, p. 62).

The triadic approach to attention is detailed by P. Sven Arvidson (2006). He defines three dimensions of attention: *theme, thematic context*, and *margin*. The three compose what he terms “the sphere of attention.” This sphere is not an object that is experienced as such. Rather “we live in it in these three dimensions all the time” (p. 10). The sphere is somewhat equivalent to the field metaphor, an update intended to convey the depth of the experience of attention.

The structure of “sphere” resembles a circle in which the *theme* holds the middle. The *thematic context* wraps the theme, and the margin populates “the objects of marginal consciousness” (p. 11). The *theme* and the *thematic context* maintain relations like figure and background, but the division between them is not finite so that they can be experienced simultaneously (ibid). The *margin* functions like the atmosphere of the Earth, composed of content that has a link or relevancy to the theme and the thematic context. With the image of the sphere, each of the three constituents has a depth of its own and an interface to the other constituents.[[22]](#footnote-22)

Kelly, Zahavi and Arvidson try to bypass the implicit assumption that attention is limited to the foreground. After all, in real life we are capable of attending to features and objects which are at the background. For example, today only rarely do we just read a book. Reading is frequently done with music, in the park or in the train on our way to work. These backgrounds are noticed and to a certain extent are attended to. Reading in the library is different from reading on the beach. And yet, the dichotomy in which the background is that which not attended dominates the common understanding of attention. This is the nineteenth century's ideal of sitting in a quiet room isolated from the outside and reading a book or listening to the piano as depicted by Khnopff.

Technologies developed in the nineteenth century reflected the ideal of concentration and elucidation. The early cameras required the photographer to focus on a single object, leaving the background blurry. However, in recent years the figure-ground is conceived by technology developers as a limitation to overcome. For example, Samsung has developed a dual lens camera that any novice can use to take pictures in which both foreground and background are “in focus.”[[23]](#footnote-23) This lens development of Samsung implements the triadic structure that allows attention to cover figure and ground, leaving the world outside as a third layer that is unperceivable. The limitation of the triadic construct of figure-ground-world lies in the attention’s capacity to populate more than a single object. Multiplicity, according to this account, is restricted to the background, leaving the foreground to no more than a single object. My notion of multi-attention is intended to provide a framework to think of multiple objects of attention. But before reaching it, one more moment in the genealogy will be discussed, that of the fast switching attention as represented by the searchlight metaphor.

## Chapter 4. Attention as a Searchlight

### 4.1 Television and Attention

### 4.2 The Couch Potato

### 4.3 The Searchlight Metaphor

### 4.4 The Searchlight in the Internet Age

### 4.5 Hayles on Hyper-Attention

## Chapter 5. Multi-Attention

### 5.1 Technologies of Multi-attention

In the nineteenth century, multi-attention was perceived as an unmanageable nightmare. Crary cites Max Nordau’s apocalyptic prediction that “the end of the twentieth century . . . will probably see a generation to whom it will not be injurious to read a dozen square yards of newspapers daily, to be constantly called to the telephone, to be thinking simultaneously of the five continents of the world, to live half their time in a railway carriage or in a flying machine and ... know how to find its ease in the midst of city inhabited by millions” (cited in (Crary, 1998, p. 480)). In the 21st century, with the (unpredictable) rise of digital technologies like the Internet and the cellphone, multi-attention is viewed more favorably.

Multi-attention calls for a dual, triple and even quad attentions, like a dual-core processor of a computer that performs two tasks at the very same time. This approach is implemented, for example, in display techniques where a screen is split into several frames/“windows,” each running different contents concurrently. From video surveillance systems to sport event broadcasting, the split screen became popular for its ability to provide multiple points of view. Above all shines the cellphone that became the “posterchild” of this mode-of-attention and the one to blame for such a mode. Since its inception it promoted the performance of more than one task at a time (Wellner, 2016): talking on the cellphone is frequently done in the street while walking, in the park while taking care of the children, or in the car while driving. Its users’ attention multiplies as the cellphone opens a new horizon with every app. This usage mode leads the users to reconsider the multiplicity embedded in many of their activities and identify in them multi-attention.

Take for example driving. This activity originated in the late nineteenth century and became widespread in the twentieth century. Once multi-attention arises, it colors past practices with multiplicity, so that driving a car is now understood as allowing (and even requiring!) the driver to not only concentrate on the mere operation of the car but also to look outside on street signs, other cars and possibly the landscape, listen to the radio, navigate, talk to the passengers, all at the same time (see (Irwin, 2014); (Michelfelder, 2014); (Wellner, 2014)). The cellphone did not change driving dramatically but rather exposed a dimension that was hidden, that our attention can be paid to several objects at once.

Now we discover how modern everyday life is full of multi-attention technologies and techniques. Here are three examples. One is the supermarket that requires paying attention to the shopping list, find the required products in various aisles, listen to the loudspeaker announcing special prices, and push the cart while avoiding hitting other shoppers and their carts. Outside the shop, crossing the street involves looking where to step on the sidewalk and the road (especially in times of street renovations or in extreme weather conditions), see that cars and buses really stop, notice other pedestrians, joggers and bicycles, and above all navigate to the destination. Lastly, commuters have developed various occupations to pass the time of traveling, from reading the morning's newspaper or a book, to talking to other passengers. Commuters do know when the bus or train arrives to their destination and it is rare to see people missing their station. The common thread in all these examples is that such situations are frequently analyzed as multi-tasking. In the next section the affinities between multi-tasking and multi-attention will be discussed and how attention is multiplying.

### 5.2 Split and Switched Attention

Some scholars have attempted to understand multi-attention in terms of *split*attention. The underlying assumption is that there is just one attention, but it can be split to cover two, three or more objects (e.g., (Cave, et al., 2010); (Tripathy & Howard, 2012)). This split is what I called “the horcrux logic” (Wellner, 2014), referring to the Harry Potter series. Although the books do not refer to attention, the general principles of mental splitting do exist. One of the significant splits in the books is performed by the evil figure Lord Voldemort who is a powerful dark wizard. He manages to split his soul through magic that stores the resulting soul fragment in an everyday object, thereby turning the object containing the soul fragment into a horcrux.[[24]](#footnote-24) In the event that the physical body of the wizard is destroyed, he can use the horcrux as a means of his own surviving. Voldemort’s horcruxes include a cup, a diary, a ring, a pet snake, and other material objects. The scattered horcruxes are a wild collection of items all united by the magical act of storing fragments of Voldemort's soul.[[25]](#footnote-25) The method of creating multiple horcruxes was chosen by Voldemort to attain near immortality, though at the costs of diminishing his humanity and physically disfiguring of his body. The horcruxes demonstrate how the sum of the parts can be greater than the whole. They also show that there is a price for excessive usage of splitting. A relatively low number of splits can preserve the soul at a negligible cost, if at all. When exceeding a certain threshold, a reduction of a core competency (like a human appearance) might occur.

 The same logic applies for attention, according to the split attention critiques: the more attention is divided among objects, the weaker it becomes. Jon Aagaard is one of those critiques and he explains the rationale as follows: “if multitasking means performing two or more tasks that require conscious attention, it invariably comes at a cost: each additional task detracts from the overall level of attentional resources (i.e., 100%) that could otherwise be allocated to the primary task” (Aagaard, 2019, p. 92). The split attention hypothesis regards attention as a zero-sum game.

A more radical version of the reduced performance of the split attention argument is the claim that attention cannot be divided at all (Ruthruff et al., 2003). At best, it can be **switched**, and even that has a price, according to this claim ((Kirschner & De Bruyckere, 2017, p. 139) cited by Aagaard 2019, p. 95).[[26]](#footnote-26) According to this claim, there is no such a thing as multi-tasking, only task switching. Sometimes the switching between the tasks is so fast that one gets the illusion of simultaneity as in the case of computer’s multitasking where a single CPU performs fragments of tasks. Although the tasks are performed serially, the user experiences an illusion of at-the-same-time-ness because the switch between tasks/foci is very rapid. Adopting the computer-as-a-brain paradigm, the supporters of the claim assert that there should be a minimum period of time between tasks to allow the brain to process the first stimulus before handling the next one. They equate between multitasking-as-task-switching and distraction ( (Carr, 2010); (Aagaard, 2019, pp. 95-6)). Whereas these claims are usually made in the context of internet consumption and usage modes of other media technologies, they are hardly applicable to more traditional activities such as reading while listening to music or while commuting.

### 5.3 Multi-tasking

*The Oxford Handbook of Cognitive Engineering* (2013) dedicates a chapter to “multitasking” written by the computer and cognition scientist Dario Salvucci. He organizes the applied research in the area of multitasking as a continuum according to the time spent on one task before switching to the other. The poles are sequential vs. concurrent, so that in the “sequential” the tasks are performed one after the other and in the “concurrent multitasking” one of the tasks is defined as an interference that is “creating a resource conflict” (p. 58). Such a definition of concurrent multitasking implicitly assumes that multitasking is impossible and that it is no more than fast switching of attention.

Salvucci elaborates that multi-tasking is impossible in case that both tasks require the same perceptual resource or the body in terms of “motor interface” (p. 58). While such a claim may sound commonsensical, research in cognitive science has demonstrated how the visual perceptual field can accommodate two targets at the same time (McMains & Somers, 2004). Other senses like hearing, smelling and sensing can obviously detect more than one stimulus at the time. And, of course, the senses can be combined together, thereby creating a richer experience. Salvucci demonstrates his claim regarding the motor interface with two examples: one is a chef that needs both hands to prepare several dishes; the other is the computer’s window operating system, where the user can type only in one window at a time. Indeed, some tasks cannot be performed as multitasking, such as writing a text, or managing multiple oral conversations. These must involve fast switching between the threads (e.g., (Dresner & Barak, 2011); (Aagaard, 2019, p. 93)). Yet, this claim disregards the human entanglement with technologies that enables a chef to stir while the food processor mixes (or talk on the cellphone with his kids at home while cooking),[[27]](#footnote-27) and allows the dual- or quad-core computer to perform several tasks simultaneously. Many digital technologies' like computers and cellphones, allow and enable multi-tasking. I suspect that Salvucci's references are probably referring to simplified lab experiments that may not reflect the complexity of real life. Moreover, transferring the results from the clean lab to reality “has proven difficult” ((Salvucci, 2013, p. 60); see also (Wehrle & Breyer, 2016)).

A more balanced approach suggests that combining two activities may require the development of *skills* that need to be learned and practiced ((Salvucci, 2013, p. 60); (Aagaard, 2019, p. 93)). Driving is a good example of the acquiring a complex skill that involves the performance of several tasks at the same time (e.g., (Irwin, 2014); (Michelfelder, 2014); (Ihde, 2014)). Therefore, to multitask is a skill that can be learned. However, existing research is anecdotal in the combination of tasks, sometimes followed by a generalization that falls into simplification: multi-tasking impairs so-and-so capabilities we’ve had for centuries, and hence has significant adverse effects on the performance of task X. Or, multi-tasking is impossible for our brain (e.g. (Carr, 2010)). The research on the possibility of acquiring multi-tasking capabilities is not mainstream. The mainstream is occupied by experiments and theories designed to explain why multi-tasking is impossible, or at least not efficient.

Aagaard (2019) notes that current research equates between multi-tasking and distraction even when the number of tasks is not a crucial element. He shows (2015) how the critique against multi-tasking is struggling to define a task. Such a critique needs to differentiate between walking while chewing a gum on one hand and walking while talking on the cellphone on the other. The effort to define some tasks as acquired skills (e.g. driving) may provide not only an explanation why combining two tasks ends up in degraded total performance, it may also provide a solution – turning the tasks into skills. The solution of acquiring skills means that we are always already multi-taskers.

The studies of Aagaard and Salucci expose how the multi-tasking discourse uses negative terms, much like the notion of attention of late nineteenth century. For example, Salvucci explains that multitasking involves “the presence of a cognitive *bottleneck* in multitasking behavior” (2013, p. 60, emphasis added). Furthermore, under the umbrella term “sequential multitasking” Salvucci discusses *interruptions*, whether forced or planned. Even Crary falls into this trap when he describes the current mode-of-attention:

[I]f the standardization and regulation of attention constitute a path into the digital and cybernetic imperatives of our own present, the dynamic *disorder* inherent in attentiveness . . . embodies another path of invention, dissolution, and creative syntheses that exceeds the possibility of rationalization and control. (Crary 1999, p. 148, emphasis added)

The split and the diverted attention approaches currently dominate the discourse of attention. They were developed to explain how multi-tasking is impossible and how any attempt to perform multi-tasking is futile and even dangerous. They both assume that attention is one faculty and diverge on the consequences: the split version assumes that attention best operates in a single mode and any other mode must suffer from degraded results; the diverted version assumes attention cannot be split or divided, it can at best switch between tasks. Softer versions would accept that skills and technologies can help achieve some form of multi-tasking which involves multi-attention.

Theoretically, the previously described modes of attention could have accommodated multiplicity: the foreground could have consisted of more than a single object; the searchlight might have been configured with more than one ray. However, these options were not developed because attention has been conceived as referring to a single object and as a faculty that cannot be divided.

As multi-attention frequently involves technologies, philosophy of technology may provide some guidance. In this context, multi-attention can be extracted already from early Heidegger's tool analysis in *Being and Time* (Section 5.3), and later in Postphenomenology (Section 5.4)*.* It can also be inspiredfrom the works of Deleuze and Guattari (Section 5.5). Although these philosophical sprouts have existed for decades they did not mature into a complete theory of multi-attention. An explanation can be found in feminist theories and the identification of multi-tasking and multi-attention with marginalized populations. The feminist theory provides a turning point for the concept of multi-attention (Section 5.6) and turns it into a legitimate mode of attention. The next two sections overview a few of the new theories that regard the possibility of multi-attention as legitimate: in neuroscience (Section 5.7) and in anthropology (Section 5.8). The last and concluding section (5.9) analyzes two new philosophical discussions that emerged in the second decade of the 21st century, by Watzl and by Wehrle and Breyer.

### 5.4 Multi-Attention in Heidegger's Work

Martin Heidegger's tool analysis in *Being and Time* (1996) is a key text in philosophy of technology, but it is rarely discussed in the context of attention (cf. (Harman, 2009A)). In his tool analysis, Heidegger identified two types of relationships we have with technologies – the ready-to-hand (*zuhanden*) and the present-at-hand (*vorhanden*).[[28]](#footnote-28) Each of them represents a distinct way in which we are *attentive* to tools. The readiness-to-hand designates the phenomenon of not directing the attention to familiar everyday tools as long as they function according to our expectations. Once a tool, such as a hammer, is broken, unusable or absent, our attention is attracted to its absence or malfunctioning, and it becomes present-at-hand. When an object is present-at-hand, it can be attended to. Heidegger expanded the presence-at-hand also to scientific investigations in which the object is subject to circumspection thus occupying one's full attention. The present-at-hand can be regarded as equivalent to the focusing mode-of-attention. The ready-to-hand seems to represent multi-attention as there can be many ready-to-hand relations at the same time, i.e. to a hammer, a table and the surrounding workshop.[[29]](#footnote-29) From attention perspective, the tool analysis presents two modes of attention: the focusing lens (presence-at-hand) and multi-attention (readiness-to-hand).

Can multi-attention be also practiced in the presence-at-hand? An example of such a possibility is provided by Jean-Paul Sartre when he discusses a pain in his eye while he reads a book. He observes, “The pain is neither absent nor unconscious; it simply forms a part of that distanceless existence of positional consciousness for itself” (Sartre, 1984, p. 440). As the pain reaches consciousness, Sartre's attention remodels and doubles. He continues to read the book, but his attentions are paid to both the here-and-now pain *and* the content of the book.[[30]](#footnote-30) The content of the book diminishes to some extent as the consciousness is “allocated” to the pain, prompting a redistribution of the total attentions. The book and the painful eye push in opposite directions, and still reading a book makes the pain more bearable, somewhat compensating for the nuisance. Had it been a pain in another organ that is not required for mere reading, like a finger or the back, the distraction effect of the book might have been even greater. Indeed, reading the book is not as easy as it was before, but the alleviation of the pain is a prize worth the degradation in reading. Even the opponents of multi-tasking would be probably willing to pay this price for reducing a pain. With such a trade-off, the total experience is more satisfactory. The same logic guides dentists to install televisions on the ceiling of their clinics so that the patients' attention is not directed solely to the teeth and the treatment.

Sartre's book redistributes and reallocates attention. If Sartre hadn't read a book, the pain would have been experienced differently. Media technologies, such as a book, not only attract and distract attention as Augustine showed us, but also multiply it. The common analysis zooms in on the ability of media technologies to attract the attention of the user. Multi-attention analysis takes an additional step and examines the user’s attention once it is attracted. Such an analysis would reveal that a new space emerges *in parallel* to the immediate physical surrounding. That new space can be geographically remote as in the case of live news broadcasted on TV, or the interlocutor’s space produced through a telephone conversation or e-mail exchange. The new space can also be remote in time, as in the case of a documentary movie or a history textbook. Or it may be altogether virtual, as in the case of a fiction book, a movie or a video game (Wellner, 2011). These spaces enjoy the user's attention that is now multiplied.

Furthermore, even though we can multiply our attention without technologies (e.g., by simply looking around us), media technologies do so more effectively. The pain can be alleviated by our thoughts (i.e., meditation), but it is easier to multiply the attention with the help of media technologies and their associated practices, such as reading a book, watching television, playing a game, listening to a story (in this context language is media technology), and the newer technologies of the Internet and the cell phone. Compare the experience of silently driving a car to driving with the radio turned on, or with a friend attending the journey, or while talking on the cell phone. Even if there is less attention to the operational aspects, the whole experience is more vibrant. It can even be considered safer if compared to falling asleep while driving.

### 5.5 Multi-Attention and Postphenomenology

In phenomenology, the multiplicity dimension already exists, as we have seen in Heidegger's tool analysis and in Sartre's structure of consciousness when he reads a book and feels pain in his eye. Similarly, Sebastian Luft reconstructs Ernst Cassirer's notion of attention as multiplicity of contexts in which an object appears (2017, p. 93). Postphenomenology follows this path, especially in its key notions of pluriculture and multistability.

The notion of pluriculture designates the mixing of various cultures, as evidenced in international cuisines, fashion and art that combine elements from more than a single source. As an analytic notion, pluriculture is a way of seeing the world. This way of seeing, Ihde asserts, requires some training: “at first, it is hard to discern what is being seen. There seem to be too many bits to ‘read,’ and the proliferation is very much *unlike* the ‘reading’ of a book” (Ihde, 1990, p. 174). As the skill to notice multiplicity is acquired, what seemed to be “too many bits” becomes comprehensible. This skill does not require focusing on a single object, but rather regards attention as something that must be given to several targets. Ihde exemplifies this notion by a newsroom of a TV station where multiple screens show different contents to be selected for broadcasting by the director (1993, 64). The newsroom is a typical example of technologies that call for multi-attention. Yet, unlike the newsroom in which all TV sets are of similar size, in most cases the objects of multi-attention are not uniform, and attention is not necessarily allocated equally among them. Originally the term pluriculture covered cultural practices, from high “Kultur” to the more mundane cooking techniques. Ihde then expands it in the direction of the newsroom. Now it is time to further expand it so it should also cover: young people’s practices of doing homework while listening to music and watching television (Hayles, 2007); women's endeavor to maintain a career while taking care of their children (Thayer-Bacon, 1999); and older adults' effort to talk to their partner while cleaning the dishes (Tun & Wingfield, 1995).

Compared to pluriculture, the notion of multistability has already been expanded in the postphenomenological literature ( (Ihde, 2009); (2012); (Rosenberger, 2014); (2016); (Whyte, 2015); (Wellner, 2020)). It became a central concept in postphenomenology and has proven to be useful for conceptualizing and understanding our technology-intensive environment. It indicates how a given technology has different meanings to different people at different times. The cellphone is paradigmatic for its ability to serve as a telephone, a music playing machine, a gaming console, a television, a radio, a navigation assistant and more. The meanings change from one user to another, metamorphose over time, and sometimes even co-exist within the same user at the same time. Postphenomenologists aim to show that technologies are always-already multistable. Each mode of usage, meaning, context or goal forms a stability, and their collection is termed multistability.

Ihde analyses the postphenomenological notion of multistability using the Husserlian concept of variational analysis that exposes “both the richness of variety provided in lifeworld experience and [the ability] to locate whatever structural features may be found” (2016, 111). Variational analysis has therefore two components – variety/multiplicity and structure-revealing capacity. The difference between Husserl’s variational analysis and Ihde’s notion of multistability lies in the different goals of the respective analyses that can be framed as essence vs. invariants. The Husserlian notion of essence is understood as something objective, independent of context, and reflecting a certain truth. It comes in the singular. By contrast, the postphenomenological notion of invariant colors the experience (or the analysis) in a specific way, is context sensitive, and comes in the plural. So, whereas Husserl looks for one single essence, Ihde seeks many invariants. Invariants are seen as “correlational rules” (Ihde, 2012, p. 24) or “structural patterns” (22). They function like attention.

Multistability has many forms, sometimes termed “pivots” (Whyte, 2015), sometimes classified as “forms of analysis” (Rosenberger, 2016), and sometimes arranged as “regions” (Wellner, 2020). Pivots are different perspectives for the multistability analysis, such as human practices for a given technology-object, variations of a technology in terms of materials and design, ethical consequences resulting from the relations between the user and the object, or the assessment of a technology. The regions reveal the multistability of the notion of multistability, where the application of the notion differ, *inter alia*, by the number of stabilities, that is—a few options, endless mutations, or many variations.

The genealogy of attention has revealed that this notion is multistable so that it means different things to different people at different times, from a faculty that enables reading to the ability to multi-task. Attention can be modeled not only in the singular form, but also in the plural. While for some people attention is a source for problems as Crary shows, for others it is regarded as an enabler of everyday tasks.

Pluriculture and multistability include the grains of multi-attention, albeit the full account of attention is not there yet. The mission of this book is to complete this lacuna. The gap is filled by additional concepts integrated into postphenomenology. In the next section the concept of schizo-analysis will be discussed and converted into the multi-attention framework.

### 5.6 Multi-attention as Schizo-attention

In modern society, schizophrenia is a mental problem frequently modeled from the attention perspective, i.e. as a “reduced or damaged capacity for selective attentiveness” (Crary, p. 37). Those who suffer from it are identified as being too attentive, as paying attention to too much perceptual data thereby suffering from a constant overload. But for Gilles Deleuze and Felix Guattari becoming schizo is an effort to bypass the dichotomy of normality and neurosis. They regard schizophrenia as “a positive process” that forms an “inventive connection, expansion rather than withdrawal. Its twoness is a relay to a multiplicity” (Massumi, 1992, p. 1). I turn to Deleuze and Guattari not for their unique point of view on schizophrenia but rather for their celebration of multiplicity whenever possible.

Deleuze and Guattari coin the term “schizo-analysis” as part of their attempts to develop into contradicting directions such as the transcendental and the materialist analyses (Deleuze & Guatari, 1983, p. 120). For them, schizo-analysis is a “metamodeling” which is based on a “diversity of modeling systems” (Guattari, 1995, p. 22, quoted in (Watson, 2008)). It is a new way of exploring the self and the world. Consequently, “Schizoanalytic metamodeling . . . recognizes, and even borrows from, existing models. It can transform an existence by showing paths out of models in which one may have inadvertently become stuck” (Watson, 2008).

Another variant of Deleuze and Guattari's schizo prefix is the “schizo body.” It illustrates a body that struggles between the discrete organs that composes it and the one-ness of the whole body. The schizo-body is “waging its own active internal struggle against the organs, at the price of catatonia” (Deleuze & Guattari, 1987, p. 150). It is a body delicately balanced from within, and thus can serve as a model for the structure of attention.

Inspired by Deleuze and Guattari's terminology, multi-attention can be conceptualized as schizo-attention. Like the schizo-body, the schizo-attention is a composition of attentions where each of them pushes in another direction. Going from the inside to the outside, schizo-attention is a way of revealing the world through multiplicity:

As for the schizo, continually wandering about, migrating here, there, and everywhere as best he can, . . . reaching the furthest limits of the decomposition of the socius . . . It may well be that these peregrinations are the schizo's own particular way of rediscovering the earth. (Deleuze & Guatari, 1983, p. 38)

The wandering in multiple directions fits the field construct proposed by Merleau-Ponty that designates free movement of attention in the attention-as-lens model. The schizo-attention adds the way of operation to Merleau-Ponty's field, that is—the exploration of the world through endless multiplications, thereby becoming liberated from restrictive hierarchical orders (Deleuze & Guatari, 1983, p. 86). Like schizo-analysis, schizo-attention develops to various directions, including contradicting ones, and transcends the figure-ground dichotomy as well as the illuminated-dark illustration of the searchlight metaphor.

Moreover, schizo-attention shows what multi-attention can be like if we split endlessly—we might end up with diminished attention, an inability to notice, catatonia. The critiques of multi-attention claim that this is the only possible result, even when splitting into two “streams.” But what if below a certain threshold multiplicity can safely reside? Being aware of the danger of catatonia may help to identify that threshold. It will allow us to enjoy the benefits of multi-attention.

### 5.7 Feminist Perspective on Multi-attention

Quilts are well designed textile works composed of small pieces of various fabrics usually structured in complex geometrical patterns. As quilting is done mostly by women, it became a significant research topic for feminist studies. Beyond its expressive results, quilting serves as key metaphor in the feminist literature (Showalter, 1986) and art (Robertson, 2014), and more broadly for what can be termed - following Arendt - as the female condition. In this book, quilting will serve as a metaphor for multi-attention.

In her seminal work, Elaine Showalter (1986) describes the three basic actions of piecing, patchwork and quilting as typical feminist practices. Piecing connects small pieces of fabric, patchworking joins the various elements to an overall design and quilting is the embroidering that connect the pieces to the filler and the backing. In this process, all the pieces are coordinated into a coherent frame of the final quilt. The multiplicity does not result in a messy or unaesthetic end-product. On the contrary, the end result is colorful and artistic. Showalter correlates the small pieces of textile to short stories written with “the techniques of literary piecing” (p. 229). Writing is like “the stitching together of scenes” (p. 233).

The piecing, patching and quilting are frequently done in parallel, thereby “reflect[ing] the fragmentation of women's time, the dailiness and repetitiveness of women's work” (p. 228). This characteristic of the production of a quilt was duplicated by Showalter and her friends in a new context. She recalls how “in the early 1960s my Bryn Mawr classmates and I knitted as well as noted in lecture after lecture on the male literary classics” (p. 225). The practice of attending a class, taking notes and knitting at the same time is an example of multi-attention, albeit Showalter does not refer to attention as such.

Piecing, patchworking and quilting can be performed by multiple (female) actors and in parallel. To create a quilt together, women used to organize parties known as the “quilting bees” that gathered friends and neighbors.[[31]](#footnote-31) The neologism of the quilting bee serves Barbara Thayer-Bacon (1999) to explore knowledge production strategies. She contrasts between two models: the critical thinker and the “quilting bee.” The former is well represented by Rodin's statute the “Thinker” which frequently symbolizes a “solitary male who is using his mind to logically reason through his problems to find transcendental Truth” (p. 48). The latter is related to what she terms as “constructive thinking,” according to which thinking is an active and social function, in line with the theories of Vygotsky and Piaget. Thayer-Bacon describes how in the “quilting bee” parties “[p]eople talk to each other, maybe even sing, and they reach and stretch across a quilting frame to put their patterned pieces of the quilt together. People move around the room, getting something to drink, a bite to eat, or stopping to hold a child” (p. 52). She contrasts these parties against the silent and solitary “Thinker.” These are two distinct mode of knowledge production. One is performed by a single person, the other by a group composed of a variety of knowers who share a common interest. In the context of attention, Rodin's “Thinker” may represent Augustine's silent reader and later the ideal of the late nineteenth century of focusing. The quilting bees are active, multiple and multi-taskers, hence can model multi-attention.

Thayer-Bacon parallels between the quilting bee and constructive thinking in several aspects, and the analogies that she constructs are also applicable to multi-attention: First, there is a multiplicity of knowledges in the quilting bee and in constructive thinking. Likewise, the multi-attention approach refers to attention in the plural, i.e. attentions. Her reference to knowledge as a multiplicity follows in the footsteps of Donna Haraway’s notion of knowledges (Haraway, 1998). In both cases, the addition of the “s” might be read by automatic spelling checkers as an error, but it aims at pointing at a fundamental shift in the common view. Multi-attention follows this path.

Second, “[q]uilting bees are full of conflictive and divisive possibilities” (Thayer-Bacon, 1999, p. 51). It is a mode of knowledge production that can accommodate controversies. The same mechanism applies for multi-attention that can push to opposing directions as described by Deleuze and Guattari's image of the schizo. Thus, I can be attentive to writing this text and to the sounds of the kids playing outside, although the two may be regarded as conflicting with the latter classified as distractive, according to traditional theories of attention.

Third, Thayer-Bacon explains that “knowledge is not found out there in the world or inside ourselves” (p. 51) but it is the result of a negotiation or a dialogue. Knowledge production is a socially contextualized act, yet it requires some personal skills. The participants of the quilting bee need some sewing skills, but not all of them practice these skills at the same time. The sewing itself is indebted to other activities such as preparing food, organizing the supplies, playing music and cleaning. Analogously, attention is the result of a dialogue within a given context. Driving, for example, requires more than mastering the mere mechanical skills of operating the car. The driver must also be skilled also at integrating the car within the flow of other cars, as well as be attentive to the happenings withing the car, may they be other passengers, the radio, the GPS instructions or a conversation on the cellphone.

Fourth, the quilting itself is a complex act that requires various materials in order to produce the final artifact. Likewise, constructive thinking and multi-attention require various resources.

Fifth, the work itself can progress linearly, but this is not a must. Emphasizing the importance of the process, the final quilt may remain unfinished. Constructive thinking may leave some ends open, and multi-attention will not always result in completed tasks. The process is no less important than achieving a certain goal.

The quilting bee metaphor assists Thayer-Bacon in constructing a feminist understanding of knowledge based. Similarly, in this section I employ this metaphor to construct the notion of multi-attention. Both constructive thinking and multi-attention are in the plural and reject attempts to impose hierarchies on these practices.

### 5.8 Multi-attention in Neuroscience

Many contemporary thinkers refer to the neurological aspects of attention in the age of the Internet. Their basic claim is that the mode of attention promoted by using the Internet significantly changes the brain. Nicholas Carr, for example, attests: “I began to worry that my use of the Internet might be changing the way my brain was processing information” (Carr, 2010, p. 38). He sees not only a correlation but also a causation between Internet browsing and changes in the brain. He identifies the changes in modes of attention in the synapses, as a general attribute of the brain. Attention for him is the way the synapses are configured, hardwired. Likewise, Bernard Stiegler states that “synaptogenesis is profoundly modified by contemporary media” (Stiegler, 2010, p. 19).[[32]](#footnote-32)

But the neuroscientific research on attention does not refer to attention as a general capability. Rather, it is identified and mapped in several regions in the brain, each is in charge of a specific aspect of attention. One of the influential works was published back in 1990 by Michael Posner and Steven Peterson consisting of an overview of the efforts to connect cognitive operations with anatomical neuronal activity. They centered on those regions in the brain where attention “occurs,” and grouped them into three attentional neural subsystems, so that each subsystem resides in one or more “areas” in the brain but works in coordination with the others, thereby forming a subsystem. The subsystems are:

(a) **orienting** to sensory events: this subsystem is exemplified with visual locations, so that if one attends to a given location, whatever happens at that location gains his or her attention.

(b) **detecting** signals for focal (conscious) processing: the ability to detect a signal out of a flow of signals or from multiple spatial locations. It functions like a “spotlight” (Posner & Petersen, 1990, p. 35).

(c) **alerting**: maintaining a vigilant or alert state, including “the ability to prepare and sustain alertness to process high priority signals” (p. 35).

These subsystems are anatomically discrete and are separate from the brain's data processing systems that deal with specific inputs. The subsystems cooperate with one another to accomplish attentional tasks so that each of them deals with a different set of attentional processes.

 Posner and Peterson refer to multiple types of attention. The orienting subsystem is similar to the focusing mode of attention described in this book as “moment one;” the detecting subsystem is described by the authors as equivalent to the searchlight metaphor, described as “moment two.”

Later brain research showed how multi-attention can exist on the single subsystem level. If for Posner and Peterson vision is an example of a single focus “orienting,” Stephanie McMains and David Somers (2004) prove that vision can be multiple. They present fMRI evidence for the ability to attend to two separate locations concurrently. In their experiments, they show that “attention may be simultaneously deployed to multiple, distinct regions of space” (p. 678). In other words, we can attend to multiple spatially distinct regions of space at once. They explain that the “spotlight” of spatial attention can be in fact “split” (p. 678). The experiment further checked the fast switching theory and found out that subjects did not switch their attention and were able to attend to the two locations simultaneously.[[33]](#footnote-33)

In a comment on the findings of McMains and Somers, Frank Tong (2004) repeats the urban legend that Elvis Presley had a TV room with 3 TV sets lined up along the wall where each was showing a different program simultaneously. Tong explains that for those who support the spotlight approach, viewing all three sets at the same time is not possible because according this approach the spotlight cannot be divided across multiple locations. The results of McMains' and Somers' experiment, however, provide neural evidence that subjects can attend to two separate regions of space.

More than twenty years after their seminal article, Peterson and Posner updated their overview (2012). The findings of 1990 that were conceived “speculative and controversial” (Posner & Petersen, 1990, p. 26) became solid facts. This solidification was accompanied by several changes. First, they changed their terminology and instead of subsystems they referred to networks. Now attention is a set of several networks together forming the attentional system. Second, they redefined the three original networks according to the rich experimental data collected, including different naming of one of the networks. The result is a new order of presentation of the networks, which implies changes in their significance:

* **Alerting**: related to arousal and vigilance, involving the ability to respond to warning signals.
* **Orienting**: prioritizing sensory or mental input by selecting a modality or location. It can be the act of following a moving target (which can be detected by the eye movement) or more abstract processes like progressing along a number line.
* **Executive**: Originally defined as “detecting” or “target detection,” this network starts working once a target is detected thereby lowering the ability to detect another target. It also contains awareness of the target, focal attention, and self-regulation of mental processes. It is expanded to include also “perception of either physical … or social … pain, processing of reward…, monitoring or resolution of conflict…, error detection…, and theory of mind...” (Petersen & Posner, 2012, p. 77). This network works as a top-down control.

The last network went through additional changes beyond expansion and change of name. Peterson and Posner (2012) split the original detecting (now executive) network into two (newly named) executive networks. Then they further extended the framework to include a whole new network (see table 2 for comparison):

* **Executive/background maintenance**: relevant for task performance as a whole, required for carrying out goal-directed activities.
* **Executive/task switching and initiation**: needed to start a task, perform adjustments to the task in real time, and switching from one set to another.
* **Self-regulation**: a newly identified network for the controlling of one’s thoughts, feelings and behavior. It can be conceived also as willpower.

|  |  |
| --- | --- |
| 1990 | 2012 |
| Orienting (to sensory events) | Alerting (originally “maintaining”) |
| Detecting (signals for focal processing) | Orienting |
| Maintaining (a vigilant or alert state) | Executive I (originally “detecting”) |
|  | Executive II |
|  | Self-regulating |

 Table 2: Attentional neuronal networks according to Posner and Peterson

The concept of multi-attention presented in this book relies on the brain’s capacity to manage several tasks that is managed by the second executive network. Although termed “task switching,” it is in fact enables the maintenance of several attentions. As a brain capacity, it can be trained. Thus, learning how to drive needs to include not only skilled “alerting,” but also skilled multi-attention.

To conclude, as per 2012, neuroscience has identified total of five networks that deal with attention in the brain. Two findings are important for the thesis of multi-attention presented in this book: first, that these networks of attention work in parallel in different regions in the brain; second, that attention can manage several parallel processes through the “executive” networks. Although Posner and Peterson do not explicitly determine that attention can be given to more than one object, the finding of multiplicity of networks provides a potential foundation for the multi-attention approach.

### 5.9 Multi-attention in Anthropology

Tim Ingold is an anthropologist who studies that the experience of being together. He criticizes the modernist tendency to refer to individuals resulting in experimental protocols that favor the single phenomenon. He further rejects the idea of an independent individual and calls for a new understanding that would accentuate the community and the communication between people. Ingold's project is aimed to construct an alternative to the modernist individualistic framing of “volition-agency-intentionality” (Ingold, 2017, p. 20). Against these three classical terms, he positions three other notions, some of them are neologisms: habit, agencing and attentionality.[[34]](#footnote-34) All three are deeply related to attention and specifically to multi-attention, though multi-attention as such is not mentioned by Ingold. Together they form what he calls “a theory of correspondence.” He defines correspondence as “the process by which beings or things literally answer to one another over time” (p. 14). The correspondence functions via the three mechanisms of habit, agencing, and attentionality.

For Ingold the habit is a central element of our everydayness. He writes: “we dwell in habit. And dwelling in habit . . . is fundamentally attentional” (p. 16). A habit assists Ingold to explain how we are able to walk and navigate at the same time and still be attentive to both actions, as well as to others. Possibly the word “actions” is not the right one for the argument that Ingold develops. Maybe the word “experience” would be more suitable (p. 16), thereby bringing to the fore an affinity of his theory with phenomenology. It is an experience that requires “thinking” (p. 16), or better – attention.

The experience involved in the habit is not passive but rather an active relation to the world. Elsewhere Ingold explains: “Were we but passive in the midst of experience we would be overwhelmed by it and incapable of answering to it” (Ingold, 2018, p. 22). Explaining attention as a mere filtering mechanism of a subject bombarded by inputs from the world in fact assumes a passive subject. Ingold attempts to construct an active subject that is not bound to the modernist dichotomy of subject-object. The result is a richer understanding of attention.

The second element in Ingold's theory of correspondence is agencing which is the verb form of agency, intended to reflect the fact that not all of our acts are the result of our agency. Instead, Ingold argues, agency is the result of our acts or a potential directionality, and hence defined as “the potential of undergoing reflexively to transform the doer” (2017, p. 17). It is an attempt to find a mid-way between the active and the passive voices that English grammar dictates. It reminds of the definitions and classifications of attention that struggle between the active and the passive forms (e.g., (Merleau-Ponty, 1962)). For the purposes of this book, the element of directionality becomes more important when dealing with the third element, the attentionality.

Attention, for Ingold, is distinguished from intention. He identifies a conceptual gap between the situation of walking while navigating and the situation of reading in spite of a pain in the eye as Sartre describes. In Sartre's example, “the mind attends, the body distracts” (p. 19), and intention becomes synonym for volition. Ingold highlights the contrast between the willful intended act and the habitual act. Sartre's reading resembles the act of planning to go for a walk which is different from the act of habitual walking. In habitual walking, attention is given to the things on the way, while moving: “The attentive walker tunes his movement to the terrain as it unfolds around him and beneath his feet, rather than having to stop at intervals to check up on it” (p. 19). This mode-of-attention does not match the well-known duo of attention-distraction in which attention is understood as equivalent to focusing, and distraction is interpreted as “what happens when attention itself pulls in different directions, leaving the walker in a bind and causing awareness to stall” (p. 19). This rejection of the attention-distraction duo leads Ingold to recognize the principles of what I term in this book as multi-attention in which “Our attention can, as we say, be caught or captivated, pulled in one direction or another, or sometimes *in several directions at once*” (p. 19, my emphasis). Ingold further examines the spotlight model and finds it unsuitable to the situation of walking while experiencing the world around us. In walking, he claims, attention is “emergent in the event” and is dictated by the “directionality” of the event (p. 19). He summarizes: “if the principle of volition renders a form of attention founded in intentionality, the principle of habit gives us a form of intention founded in attentionality” (p. 19). This understanding of attention explains how we are transformed in the attentive process.

Ingold's anthropological and phenomenological perspectives contribute to the notion of multi-attention several aspects. The first is the focus on doing, may it be walking in the street or in an open landscape, may it be driving or changing diapers. All these are habits that allow our attention to multiply. The second is the link between attention and intentionality. In focusing, attention and intentionality become one. Once we allow additional modes-of-attention, we realize that there can be attention without intentionality, as evidenced in the Gorilla experiment. The third is the anthropological mapping of several modes-of-attention as experiences in and of the world. Multi-attention is open to other modes-of-attention and does not require to be defined as the only legitimate mode.

### 5.10 21st Century's Theories of Multi-attention

In the previous sections we saw how neuroscience and anthropology have recognized multiplicity in attention during the second decade of the 21st century. Philosophy is no exception and within the same time frame more and more philosophers have theorized aspects of multi-attention. Moreover, in all three disciplines the identification of such multiplicity can be traced even earlier, to the second half of the twentieth century, and in retrospect we can find hints and sprouts suggesting attention is not limited to one object at a time. The previous sections described the hints and sprouts in Heidegger's tool analysis, in postphenomenology and in the writings of Deleuze and Guattari. The following sections detailed how neuroscience and anthropology recognized multiple attentions. In this section I bring two philosophical theories supporting multiple attentions, one from philosophy of mind and the other from phenomenology.

In philosophy of mind, Sebastian Watzl conceptualizes how multiple attentions function together. His solution calls for degrees of attention. He uses an example of listening to a jazz band, where attention can be focused on the piano or the saxophone, yet the listener remains conscious of both. He stresses, “it makes a phenomenal difference which one you pay *more* attention to” (2011A, p. 723). Likewise, if while commuting, one's attention is focused on reading a newspaper, one is still attentive to the other passengers (2011B, p. 146). According to Watzl, attention should be regarded as a set of attentions given to several objects to various degrees and extents. He terms these degrees and extents “priority structures” and contends that they “can take many different shapes” thereby fashioning “different forms of attention” (2017, p. 82).

The priority systems are key to Watzl's theory of attention. He argues that each sense is controlled by an attentional priority system in which multiple stimuli are managed. All the senses are united under the umbrella of a single perceptual priority system, albeit multiple mechanism of prioritization are maintained (pp. 103-105). Therefore, according this argument, being focused means that an object or an aspect of it gains the top priority within a given priority system (p. 86) and in the whole attentional system. This approach allows Watzl to accept the fact that “a subject may attend to several things at once” (p. 83). Yet, his thesis does not fully match multi-attention, and it differs on three important points:

The first major difference between multi-attention and Watzl's concept of attention is with regards to the number of objects of attention. Watzl seems to struggle between multiple attentions and focusing: On one hand he constructs multiplicity of priority structures that work in parallel, but on the other hand he attempts to reduce these structures to one system that connects and controls all of them (p. 92). In other occasions, Watzl implicitly equates between attention and focusing on a single object, and explicitly accepts Salvucci's claims that multi-tasking is no more than fast switching between tasks (p. 104).

Second, Watzl constructs hierarchies within a given priority system. Contrarily, the notion of multi-attention is less occupied by the question of to which object *more* attention is paid, compared to others. In multi-attention, the degrees and extents of attention do not require the production of a hierarchy as that of the foreground-background model. Put differently, whereas Watzl is interested in the top priority, I examine all the rest. From multi-attention perspective, in the example of reading while commuting it does not matter that “more attention” is paid to the reading. What is important is to get off at the right station. These are two processes that run in parallel.

Moreover, Watzl's focus on hierarchies leads him to differentiate between “divided attention” and “distributed attention.” In divided attention two (or very few) priorities are higher than all others. In distributed attention all priorities are equal, so that attention is equally distributed among several objects (p. 85). From the perspective of multi-attention which rejects the idea of hierarchies, divided and distributed attentions can be held as synonyms.

The third difference concerns the reference to the inside vs. the outside. For Watzl, the inside is the realm of attention and the outside is of intentionality. He links between attention and intentionality in a way that attention deals with the internal world of the attentive subject, and intentionality deals with an external object to which one's attention is directed (p. 83). This is a relatively simple link that does not take into account technological intentionality which may shape the “subjective” attention. Watzl seems to be bound by the modernist subject-object dichotomy even if he sometimes struggles with it. He finds that it is not easy to distinguish between subject and object:

A dancer's attention is highly engaged, just as the basketball player's or a reader's attention, yet it would be difficult to say just what he is attending to. The music? His movements? None seems exactly right. When an activity like dancing, playing basketball, or reading occupies the subject's attention there will often be no object of her attention. (p. 85)

Watzl points to a difficulty to identify an object of attention when the attention is directed to what he considers as belonging to an internal sphere. Watzl in fact demonstrates that activity is a difficult concept for the modernist theories of attention expressed in terms of the subject-object dichotomy. His solution is to define objects of attention as something that is “'curved out' by attention” (p. 92), thereby implicitly following Merleau-Ponty and the phenomenological tradition.

This solution is difficult to apply to complex actions such as “playing basketball” because it requires to classify their components into “internal” or "external” acts. Such situations have been studied in the context of football which similarly requires paying attention to the ball, to the other players, to the rules of the game and to the field as a whole (Tripathy & Howard, 2012). If one of these objects of attention gains a lower priority, then the player will probably not succeed. Yet, Watzl would deal only with the running in the field and is likely to ignore the other players, the ball, the referee etc. Multi-attention would enable us to model this complexity by “allowing” a subject to be simultaneously engaged with many “internal” and “external” objects of attention. In the case of the dancer, we will expand the analysis to include not only the “internal” act of dancing but also some “external” objects of attention like the music, the floor and the other dancers. What is important is that one can be attentive to more than a single object at the same time.

In summation, Watzl's project is important since he attempts to conceptualize attention as the structure of consciousness, i.e. the subjective experiential perspective on the world. He positions attention as a central element that enables us to give meaning to our experiences. Yet, he withdraws to previous concepts such as regarding our consciousness as structured into foreground vs. background (p. 183-4). A multi-attention theory would resist this conceptualization and would claim that while the experience is structured as center vs. periphery, it does not necessarily mean that the center must be occupied only by a single object. At the center there can be more than one object of attention.

A more critical approach to existing research on attention can be found in the work of Maren Wehrle and Thiemo Breyer. They reject nineteenth century's negativity that views attention as “a limited resource” or “a mechanism of exclusion” (Wehrle & Breyer, 2016, p. 44). Instead they define attention as “a benefit” (ibid) that allows the selection of the relevant stimuli.

Furthermore, they note that experimental psychology and cognitive science tend to refer to attention “as a singular episode” (p. 41) that is studied in isolation (p. 47). However, attentional acts, due to their special nature, should be considered as a rich phenomenon, “with reference to their embeddedness in subjective and objective, temporal and spatial contexts” (p. 47). The common psychological attitude simplifies the attentional act in the experiments in order to establish their credence, but this attitude also widens the gap between the laboratory and real life. The common research program that selects a single object yields a too narrow focus, Wehrle and Breyer argue. Instead they call for a more holistic approach that regards attention as something that “functions in a *situational* and *bodily* manner” (p. 45). Thus, a football field “is no static object, [but] rather . . . [opens] new affordances” (p. 45) which may lead to certain perceptions and acts. What is important is the context it creates, and thus the field should be studied with the acts of the players. The mere acts would not suffice to explain the attention of the players. Unlike Watzl that struggles to model the attention of the dancer, Wehrle and Breyer can (relatively) easily do that with their notion of “bodily attention” (p. 46).

Wehrle and Breyer's approach can be labeled as “flat” as they try to avoid the hierarchies that Watzl constructs, the bottom-up and top-down approaches that we saw in neuroscience, and the passive-active debate that Merleau-Ponty is engaged with. Instead, they

take attention to be an 'in-between phenomenon' that should not be reduced to one side or the other, but considered as a process that mediates between personal ('higher') and sub-personal ('lower') levels of cognition, inner control and external influence, passive undergoing and active engagement. (p. 42)

They call their approach “dynamic” (p. 42) because it is a productive process that connects between attention on one hand and perceptions and habits on the other. This feature of their theory brings them closer to Ingold's notion of attention that is founded on habit and agencing. But instead of contrasting between attention and intention (as Ingold does), they point to a possible link between attention and intentionality. They argue that both attention and intentionality refer to the ways in which we approach the world, and both notions integrate past and future experiences, memories and expectations (p. 50).

Attention integrates past and future by functioning as a horizon. Thus, attention is not just an “act” of the mind, but also operates as “a temporal and spatial horizon” (p. 44). In a very simplified way, the horizon can be regarded as stretching between past and future: it encompasses previous actions and acquired skills, the current perceptions, and the expectations for future perceptions. They further complicate notion of attentional horizon to encompass two types that complement each other: noematic and noetic, objective and subjective.[[35]](#footnote-35) Each type can yield more than a single horizon and each horizon can be cut across the temporal and spatial ones. Thus, attention is a multiplicity of horizons.

A noematic (objective) horizon entails a dynamic positioning in the world that involves the perceiver's body. They emphasize that it is not limited to the “object's static spatial surrounding” (p. 50-1), but also includes “the potentialities of the subject” (p. 51) in terms of skills, habits, preferences, interests, attitudes and motivations. Their concept of noematic horizon highlights the importance of the background (composed of the environment and the unperceived aspects of the object of attention (p. 47-8)) as a reservoir of potential perceptions, conditioned on the subject's abilities. The noematic horizons include the potential for future perceptual acts (p. 48).

At this point, Wehrle and Breyer show how the empirical psychological research has neglected to explore the noematic horizons, that is, the contexts in which attention is practiced. What might be sufficient for lab experiments involving simple geometrical shapes of various colors, becomes less adequate when attempting to simulate real-life scenarios such as a crowded street. These situations in the experimental context lack “a more global attention strategy” (p. 49). Their solution is based on a “gestalt” apprehension that allows us to grasp a situation as a whole. Think of a kitchen for example. The “gestalt” apprehension does not require us to focus specifically on each and every object in the kitchen, yet it enables us to identify an oven, a fork and a cook in this setting. For me this is one of the meeting points between their theory and “multi-attention” as described in this book. This “gestalt” enables us to walk down the supermarket's aisle, see the products and their prices, think of our shopping list, listen to the vocal announcements on special sales and push the cart without banging into other people.

Moreover, the “gestalt” approach enables us to avoid referring to objects as static participants in the attentive process (p. 51). This kind of reference is much needed today, in the growing presence of digital technologies. For instance, when a navigation app recommends many drivers to pursue a specific route, it frequently creates there a traffic jam. That is why such an app can hardly be considered “static.” Likewise, the dynamic aspects of attention allow us to model various horizons, some are spatial like the neighborhood that our route crosses, the inside of the car and the digital horizon opened by the navigation app.

Correspondingly to the noematic horizon, the noetic (subjective) horizons encompass several dimensions: passive-temporal (past and present experiences, memories, anticipations); bodily-habitual (habits and skills); personal interests; the lifeworld (inter-subjective and socio-cultural contexts). To the problem of how to conceive the dancer and her attention as raised by Watzl, Wehrle and Breyer would offer a solution that is based on the notion of “bodily attentiveness” (p. 56) according to which the dancer develops a skill that involves the body. They detail:

Here, we observe an attentional awareness that is not directed to a specific object or locus, but more globally distributed and sensitive to a whole experiential field, in that it has to adapt quickly to sudden changes in the environment, which is in itself co-constituted by a plurality of agents. (p. 56)

Add to this detailed phenomenological account the noematic aspects, and you receive a full picture of the attention of the dancer – to her body, to the movements, to the music, to the other dancers, to the floor, and so forth.

Wehrle and Breyer's framework of horizons assists them to reveal the multiplicity in “attentional styles” (p. 55), “attentional processes” and “attentional behaviors” (p. 56), all come in the plural. Yet, they implicitly assume that each can exist only as a singular form and at one given point in time. They are bound to the searchlight discourse that discusses attention in terms of “shifting” (e.g. p. 52), and do not refer to situations such as multi-tasking. Moreover, their concept of horizon extends horizontally, so to speak, and it lacks a verticality. This is where the concept of multi-attention can complement their theory.

### 5.11 What Is Multi-Attention?

As its name implies, this concept of multi-attention stands for multiplicity of attentions. First, it models the ability to be attentive to multiple objects at the same time. This ability is usually named multi-tasking and referring to it in terms of attention frees it from the limiting metaphors of early computing or economy.

But there is more to multi-attention than mere multi-tasking. Multi-attention also involves multiple modes-of-attention. These can be focusing, like Augustine's meditative reading; figure and ground, where the ground serves as a reservoir of objects of attention; or a spotlight, which moves fast between objects. Each of these modes-of-attention can be exercised in the plural, so that the meditation focuses on the body while “quieting the mind,” the figures against the background are more than one, and the searchlights operate in parallel each switching at a different pace. Moreover, Unlike Heidegger's ready-to-hand and present-at-hand that are mutually exclusive, in multi-attention various modes-of-attention can be combined, as demonstrated by feminist scholars through the example of the quilting bee parties where the participants quilt, chat, design, put an eye on the kids – all at the same time. Maintaining several modes-of-attention is in line with the neuroscientific research that found several sub-systems or networks of attention that work in different areas of the brain, so that for example being alert and being focused function in parallel.

Multi-attention entails a complex multistability. Whereas in postphenomenology the notion of multi-stability means that the same technology can mean different things to different people at different times, in multi-attention it means that attention can come in different forms and work on a different number of objects. The result is not necessarily coherent, as Deleuze and Guattari demonstrate through their concept of the schizo, and later developed by Ingold to his notion of attentionality. The attentions can push to opposing directions and we still function properly. Some scholars (e.g., (Ihde, 2014); (Ingold, 2017)) explain that this “conflict” is resolved with the habit where one task is performed automatically so that the other(s) can enjoy from the performer's attention. Multi-attention does not need the notion of the habit to explain that attention can be given to more than one object. It can even conceptualize multiple habits so that one can walk in the supermarket *and* push the cart *and* refrain from bumping into other people, all at the same time, all effortless. Multi-attention can conceptualize a mixed multiplicity of habits and objects so that in the case of the supermarket, the attention would be paid to checking the prices while thinking of the shopping list. The notion of the habit assists multi-attention to surpass the active-passive dichotomy, in line with the developments made by Merleau-Ponty, Ingold, Watzl, and Wehrle and Breyer. After discussing how multiplicity is exhibited in the objects of attention and the modes-of-attention, there remains one additional aspect of multiplicity in attention – the attentive subject. Wehrle and Breyer criticize the tyranny of the individualism that reins the psychological experiments. But they do not discuss the possibility of exercising attention as a group. This aspect is termed “social attention” (see (Bader, 2016) and the references there) according to which attending to something already encompasses the experiences of other people who perceived the object of attention. This sharing does not require planning and preparations, it just happens. It is part of being attentive.

Social attention's multiplicity does not stop at the number of attentive subjects. It also multiplies the level of sharing. Oren Bader explains that “social attention carries different degrees of *sharedness* of the other subject's world” (p. 389), thereby introducing multiplicity to the subjective side in terms of to what extent the attention is shared with others. The previous examples of football players demonstrate the centrality of social attention to the execution of acts which may seem simple at first sight. Their coordinated actions form what Bader calls “mutual attention” (p. 383). The audience that watches the game experiences “joint attention” that is directed to the same object of attention (p. 387 and the references there; see also (Broadbent & Lobet-Maris, 2015, pp. 116-7)). Bader stresses that the sharing does not require any prior relation to the other nor any planning or coordination. Seeing people while walking in the street requires this kind of shared attention, which intensifies if two acquaintances meet by chance. This is the difference between not bumping into other people and recognizing a friend walking towards me. In the former case the level of sharedness is low, in the latter it is high.

In short, the notion of multi-attention covers multiplicity of objects of attention, of modes-of-attention and of attentive subjects and their inter-relations. There is no need to search for hierarchies or coordinations, though they may happen. One can be attentive in each and every aspect of multi-attention.

In the next part of the book I will discuss two case studies of multi-attention. One is driving while celling, based on a special issue of *Techne* that I edited (2014). The other discusses the “attention economy” that became the basis for the Internet as we know it today, in which we “pay” with our attention to free services. I both cases I will show how multi-attention offers a subversive solution to what seems to be dangerous or coercive.

1. For the lack of an agreed definition see also: (Gander, 2007); (Jennings, 2012) and the references there. [↑](#footnote-ref-1)
2. Hasse stresses that this field requires social learning that connects between people and generations. thereby linking between learning, culture and attention. Such a reading of Vygotsky reveals the collective aspects of attention (See also (Hasse, 2015); (Hasse, 2018)). [↑](#footnote-ref-2)
3. This concept of field has some weaknesses, such as giving a sense of flatness and hinting at a limit of two dimensions only (Arvidson, 2006, p. 9). [↑](#footnote-ref-3)
4. For the “on-off relationship” between phenomenology and psychology see (Hasse, 2018, p. 244). [↑](#footnote-ref-4)
5. A similar move was performed in educational studies, moving from psychology to phenomenology – see (Giorgi, 1994) and postphenomenology (Aagaard, 2017). [↑](#footnote-ref-5)
6. Waldenfels equates between attention and curiosity and positions both on the part of the senses. “There is an ethos of the senses, and attention is an essential part of it” (2011, p. 66). [↑](#footnote-ref-6)
7. In the theory of genealogy, this is the problematization (see (Koopman, 2013)). [↑](#footnote-ref-7)
8. See also (Brown, 2007, p. 155). [↑](#footnote-ref-8)
9. This part is a revised version of my article “Multi-Attention and the Horcrux Logic: Justifications for Talking on the Cell Phone While Driving” that was published in *Techné: Research in Philosophy and Technology* Vol 18 (1/2), pp. 48-73 (2014). [↑](#footnote-ref-9)
10. It can also be found as “spotlight” – see Posner and Patterson 1990, p. 35. [↑](#footnote-ref-10)
11. see also (Waldenfels, 2011, p. 68). [↑](#footnote-ref-11)
12. E.g., the Latrun Trappist Monastery in Israel. [↑](#footnote-ref-12)
13. For the central role of attention in the constitution of the modern subject see Crary 1999, p. 52 and the references there. [↑](#footnote-ref-13)
14. From the perspective of the subjective time, attention, according to Augustine, has a duration in time that is positioned between future and past. He specifically states: “our attention has a continuity” (*Confessions*, 11, 28.37). This continuity occurs “now,” so that attention occupies the present time. [↑](#footnote-ref-14)
15. Many of them shared the same logic, that is—“the structuring of perceptual experience in terms of solitary rather than a collective subject” (Crary 1999, p. 32). [↑](#footnote-ref-15)
16. Crary discusses hypnosis as a technique to control attention that was developed likewise in the last quarter of the nineteenth century. [↑](#footnote-ref-16)
17. In *Suspensions of Perception* (1999), Crary mentions “sedentarization” (p. 37) but not in the context of cinema but instead as a general practice that Foucault called the “docility” (ibid). [↑](#footnote-ref-17)
18. Projection sites quickly extended from temporary exhibition halls to theaters. As early as 1903 Harry and Herbert Miles opened a film exchange in San Francisco that served as a broker between film producers and exhibitors. The number of cinema halls grew at fast pace from very few in 1904 in the US to 8,000-10,000 in 1908 (<https://www.britannica.com/art/history-of-the-motion-picture/Melies-and-Porter>). [↑](#footnote-ref-18)
19. Another way to think of the duo attention-perception is that “attention emerges from perception” (Luft, 2017, p. 81). [↑](#footnote-ref-19)
20. Objects are not pre-given, but they are neither changing. What changes is the recognition (Zahavi, 2005, p. 90). [↑](#footnote-ref-20)
21. Crary characterizes the prevalent understanding of attention at the end of the nineteenth century as “some process of perceptual or mental organization in which a limited number of objects or stimuli were isolated from a larger background of possible attractions” (Crary, 1999, p. 28).Quickly the very few objects were reduced to one. [↑](#footnote-ref-21)
22. For Arvidson the elucidation effect is just one of five “context shifts”, along with enlargement, contraction, obscuration and context replacement. [↑](#footnote-ref-22)
23. Bertman, Art. "One Camera, Two Lenses, New Uses," *Display Daily* 22 July 2011, <http://displaydaily.com/2011/07/22/one-camera-two-lenses-new-uses/> accessed 24 February 2013. [↑](#footnote-ref-23)
24. <http://harrypotter.wikia.com/wiki/Horcrux> (accessed 1 June 2012). [↑](#footnote-ref-24)
25. From this perspective the horcruxes fit into Deleuze and Guattari's schizo-position which is a standpoint of being peripheral and not an integral part of a group (Deleuze & Guattari, 1987, p. 34). [↑](#footnote-ref-25)
26. For the confusion between *divided* and *diverted* attention see (Aagaard, 2019, p. 94). [↑](#footnote-ref-26)
27. A possible solution is provided by Gonzalez and Mark (2004) who suggest framing real-life situations in terms of sphere or projects where a common goal is the driving force of various media-related tasks. Multitasking within a sphere is considered by their respondents as consuming less mental resources. [↑](#footnote-ref-27)
28. Joan Stambauch (1996) translates *zuhanden* as “handiness” and *vorhanden as* “objectively present. ” In this book, I use the more common terms of “ready-to-hand” and “present-at-hand.” [↑](#footnote-ref-28)
29. Ihde (2010) further expands Heidegger's tool analysis by focusing on the technological experience that can lead to presence-at-hand relations by emphasizing the role of scientific investigation. This reading leads him to a positive interpretation of the present-at-hand. He reads the tool analysis together with Heidegger's later article “The Question Concerning Technology, ” so that the present-at-hand and the ready-to-hand are not dichotomies but rather “unified” thereby becoming “combined powers” (p. 54). Thus, they cover different aspects of the experience of a technology. Such an analysis assumes that attention to an object is a multi-facet experience. In terms of attention, it implicitly presupposes multi-attention on the single object level. [↑](#footnote-ref-29)
30. Sartre refers to reading a book as a figure-ground attention and examines the effect of a pain in the eye on this state of being. This example usually serves in the discussion of self-awareness. Although one should distinguish between consciousness, reflection and attention (Zahavi, 2005), it can still be enlightening to clarify the multiplicity of attentions. Zahavi refers to Sartre’s case study to demonstrate a split of reflection and multiplicity of egos that transforms the experience of reading a book. My focus is different as I look at the role of the book in constructing the pain experience, instead of examining the structure of Sartre’s consciousness. [↑](#footnote-ref-30)
31. <https://worldquilts.quiltstudy.org/americanstory/creativity/quiltingbee> . [↑](#footnote-ref-31)
32. For the various ways in which phenomenology and cognitive sciences can come together in a positive and productive exchange see Gallagher and Varela 2003. For a critique of “reductionism” approach that limits attention to neuronal activity see (Watzl, 2017, pp. 23-32). [↑](#footnote-ref-32)
33. with minimal cost even within the same hemisphere. people can attentionally track the movements of up to four dynamic objects in the visual field but can only track up to two objects in each hemifield (Alvarez and Cavanagh, unpublished data), quoted in Tong 2004). [↑](#footnote-ref-33)
34. I'd like to thank Catherine Hasse for bringing this notion of Ingold to my attention. [↑](#footnote-ref-34)
35. An interesting question is whether there can there be a third type of horizon. [↑](#footnote-ref-35)