Multi-Attention and the Horcrux Logic: Justifications for Talking on the Cell Phone While Driving

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Abstract: Attention has been addressed either as a distinction of a figure from background or as a searchlight scanning of a surface. In both ways, attention is limited to a single object. The aim of this article is to suggest a platform for an interpretation of multi-attention, that is, attention based on a multiplicity of objects and spaces. The article describes how attention can be given to more than one object, based on the experiences of pilots, parents and car drivers.

Key words: attention, postphenomenology, Merleau-Ponty, Husserl

Introduction

The word "attention" is frequently used in the context of focusing, thereby implicitly defining a single target for a certain state of mind. Attention, according to this usage pattern, is single, unified and unitary. Yet, some people manage to split their attention. Pilots, for example, are trained to split attention between the airplane's control panel, inputs from the outside, and reports from the ground; day traders split their attention between several screens and windows each displaying different sources of information; moms manage to divide their attention among children, career, and house chores (though some fathers do that equally successfully!). But in other everyday situations people are required to produce and exercise a single attention, such as students in a class, car drivers, or audiences in the darkness of theaters and cinema halls. Current cognitive research favors single attention, supporting it by explaining that our brain works best in a single task mode, where attention is given only to one object (see the references in Carr 2010; Stiegler 2010; Rosenberger 2012; Terranova 2012).

What is attention? For the nineteenth-century philosopher William James the answer was simple: "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" (James 1890, 403–04). For James, attention can have only one target. Many definitions and explanations for attention have arisen since then, most of them dealing with a single object of attention.[1]

Jonathan Crary approaches this issue from a different perspective. He refers to attention as a socially constructed concept that has changed over time. He describes its genealogy and traces the notion of attention back to Augustine (Crary 1999, 17n14). He shows that the notion has acquired its modern meaning only in the last quarter of the nineteenth century, when it became a central area of research. The notion of attention evolved from a relatively simple concept of a "state in which the consciousness is actively directed to a sensorial change" to a more complex, sophisticated, and multi-disciplinary "problem" (21). Even the definition of attention was phrased in negative terms. Crary writes, "Attention as a process of selection necessarily meant that perception was an activity of *exclusion*, of rendering parts of a perceptual field unperceived" (24–25). According to Crary, perception and attention were two names of the same phenomenon, in which attention excluded some of the perceptions. In the late nineteenth century inattention became a problem as part of the discussion of large-scale industrial technologies and their associated policies. Then inattention "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" (13). The reference to attention in negative terms dominates over a century and is prominent today in the discussion of driving while talking on the cell phone (cf. Rosenberger 2012) or disorders such as ADHD (cf. Hayles 2007).

The analysis of attention can be developed by delving into the definition of attention or continue its genealogy from the point Crary ended his project, that is, into the twentieth century. Such projects have already been carried out (e.g., references in note 1; Jameson 1991). Instead, I pursue in this article a more "pragmatic" endeavor, and delineate three "modes of operation" of attention, each of which matches a certain type of technology:

- The first mode of operation singles out a figure from its background. This is the common understanding of classic media consumption: when reading a book or listening to music, one has to be focused solely on the reading or listening activity (Crary 1999, 1). Such technologies and their related technics are conceived to require full attention, that is a quiet environment with

no interruption or stimuli. When I read a book, it is in the foreground, and the background ideally should remain silent and unnoticeable in order not to distract my attention.

• The second mode of operation is characterized by the searchlight metaphor, where attention can be quickly switched from one object to another, similar to zapping through TV channels or radio stations. The searchlight metaphor is sometimes replaced with a cinematic camera metaphor denoting the focus on an object within a frame, and then moving on to the next frame at high speed. Sometimes the switching 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. In this case the user experiences an illusion of at-the-same-time-ness because the switch between tasks/foci is very rapid. But simultaneity is not always an illusion. Hence, the third approach to attention.

• The third mode of operation calls for a dual, triple and even quad attention, like a dual-core processor computer that performs two tasks at the very same time. This approach is also implemented in display technologies where a screen is split into frames running different contents simultaneously, such as inputs from various surveillance cameras located at different spots. The aim of this article is to suggest a platform for an interpretation of multi-attention, that is, attention based on multiplicity of objects and spaces. I show how attention can span over several objects, each residing in a different space, so that we can drive a car, look outside at the landscape and talk on the cell phone at the same time.

There is a technological evolution that accompanies the three modes of operation, starting from early media practices such as reading a book and listening to gramophone music; developing into mid-twentieth century technologies such as multi-channel television; and ending in contemporary technologies which promote multiplicity and simultaneity such as computational multi-tasking. In this article I briefly describe the theoretical background of each mode of operation and sketch some of its critiques. The first two modes of operation have been analyzed in the phenomenological literature: the figure-ground mode is found in the works of Maurice Merleau-Ponty; the searchlight mode is rooted in Edmund Husserl's works. The last mode of operation is relatively new and may be based on postphenomenology as will be suggested in the third part of this article. It will be followed by a test case of driving while talking on the cell phone.

Attention as a Figure-Ground Distinction

Since the early accounts of modern attention, the definition of attention has addressed the object to which one attends, an object that becomes clearer and sharper through the attentive process. For example, John Dewey formed the lens metaphor for its ability to concentrate light and heat in a single point (Dewey 1967, 119; cf. Crary 1999, 24; Jennings 2012, 538–41). Maurice Merleau-Ponty in his book *Phenomenology of Perception* (Merleau-Ponty 2005) elaborates on the elucidation effect and develops a richer notion of attention. He 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*" (35). Attention, he posits, is active in the sense that it forms "a passage from the indeterminate to the determinate" (36). The movement from the indeterminate to the determinate creates "a new way for consciousness to be present to its objects" (33). 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" (34). The field construct 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. That is why each "round" of attention produces distinct effects. The field is also a placeholder for the context which is produced for the target of attention (i.e., object or thought). 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 understanding of attention, the target object is no longer pre-formed or pre-given but rather a "horizon" of a potential new understanding of reality (36).[2]

Sean Dorrance Kelly 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" (Kelly 2005, 92). For Kelly, paying attention means focusing on an object. The focus creates an experience not only for the foreground but also for the background, where 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" (91). He translates 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 the determinate is "roughly those features for which I have sense data," and the indeterminate is "roughly, everything else" (78). In an effort to reach a richer notion of background, Kelly further distinguishes between the "indeterminate as a perceptual absence," which he imputes to Husserl, and the "indeterminate as a positive presence" that is imputed to Merleau-Ponty (80). The difference is that for Husserl, the background is not yet seen or determined, whereas for Merleau-Ponty one can see the indeterminate (81). A 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 consciousness; for Merleau-Ponty, however, the background contains itself and does not require any further development. It has the right to exist as it is. In a nutshell, Kelly interprets Merleau-Ponty's approach to attention as a perception of both figure and background, while awareness is given to the figure and to some extent to the background. These two levels of attention move the argument from a dyad to a triad of figure-ground-world, where the world is the non-perceivable parts of the background.

A similar mix of a dyad and a triad can be identified in Dan Zahavi's writing on reflection and attention. In some discussions he presents a dichotomy of figure-ground (Zahavi 2005, 90; Thompson and Zahavi 2007, 74) or uses the term fission (Zahavi 2005, 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 *thematic awareness* where attention is given to an object, *marginal awareness* where attention is drawn to the surroundings, and the unattended rest-of-the-world (Zahavi 2005, 62).

Both Kelly and Zahavi reveal an important aspect of real life, that attention is not limited to the foreground and we are capable of attending to features and objects which are at the background (cf. Watzl 2011c). Indeed, today, only rarely do we just read a book. Reading is frequently done with music, in the park or on the train 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 not attended to 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. Technologies developed in that era reflected this "standard," and so the early cameras required the photographer to focus on a single object, leaving the background blurry. However, in recent years the figure-ground has been conceived by technology developers as a limitation to overcome. For example, Samsung has developed a dual lens camera in which novice users can take pictures where both foreground

and background are "in focus."[3] I argue that this development of Samsung is in line with 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.

Attention as Searchlight

In the introduction I mentioned James's definition of attention, in which he presented attention as a selection process of an object or thought out of a certain collection of potentialities. This type of attention is served by the searchlight metaphor that usually represents the fast switching of a highlight from one object to another. Such attention consists of the mental selection of a certain object instead of others. This approach is imputed to Husserl (Kelly 2005, 89), who refers to attention in terms of "the turning of the regard to the seen object" (Husserl 1997, 122–23) or "the glancing ray of attention" (Husserl 1999, 285). As a searchlight, the difference between background and foreground erodes and becomes meaningless (Kelly 2005, 89). That is why the searchlight and the foreground-background approaches can hardly be combined.

The searchlight approach has been criticized by Merleau-Ponty for being too rigid and fixed. First, the reference to a searchlight that "shows up objects pre-existing in the darkness" (Merleau-Ponty 2005, 30) assumes the priority of the objects over the attention paid to them. For Merleau-Ponty, the searchlight approach postulates that the objective world already exists and thus is fixed and unchangeable. Second, not only is the world fixed but the searchlight effect is fixed as well. He writes, "The searchlight beam is the same whatever landscape be illuminated" (31), thereby assuming that the formulation of attention is a uniform revealing force that only scans the surface of the world. As a result, a second "visit" of attention-as-searchlight should yield the same impression. However, in practice, a second visit does provide a different impression and therefore this model of attention, according to Merleau-Ponty, is flawed. While the searchlight metaphor may be limited by presupposing a fixed light and a pre-given object of attention, it may still be useful for conceptualizing how attention can be fast switched from one object to another. As Crary notes, "part of the cultural logic of capitalism demands that we accept as *natural* switching our attention rapidly from one thing to another" (Crary 1999, 29–30). Additionally, the superficial illumination of the surface is implicit in the searchlight image and serves well the paradigm

of shallow and flat involvement. Hence, it is no wonder that the searchlight approach is sometimes described with verbs like 'skim' and 'scan' (cf. Carr 2010).

Although Merleau-Ponty positions the searchlight approach as archaic and irrelevant (2005, 30), this mode of attention has a "come-back" in several variations. One is the television's channel switching metaphor designated by Jameson in what he calls "postmodern attention" (1991, 373). Another is taken from the world of video production and constructs attention as the switching of cinematic frame-to-frame in a movie (Dreyfus 2007, 25). As television became part of so many homes, it took over also as a source of metaphors for attention. The practices associated with television watching replaced those associated with book reading and classical music listening, and consequently the model of attention was updated.

Sometimes the searchlight approach returns in the literature on attention but without being referred to by this name. N. Katherine Hayles, in her analysis of students' study habits, differentiates between "deep attention," representing the heralded focus on a single object, like a book or music, and "hyper attention," which stands for "switching focus rapidly among different tasks, preferring multiple information streams, seeking a high level of stimulation, and having low tolerance to boredom" (Hayles 2007, 187). Hayles presents hyper attention as the current mode of attention among college students. She maintains that there is a shift from traditional deep attention to the hyper one.[4] This shift is—in the terms used in this article—from a background-foreground model to a searchlight model, albeit an extensively dynamic and vibrant searchlight.

Hyper attention is an account of the first decade of the twenty-first century. Today, it is frequently criticized for its effects on young people and Internet users (e.g., Stiegler 2010, 75–97; Carr 2010; Terranova 2012). Similarly to Crary's account of nineteenth century attention, hyper attention is described as a problem. My claim is that contemporary attention is not necessarily aimed at the fast switching from one object of attention to another, but has a more ambitious goal— simultaneous attention, or what I call here multi-attention.

Multi-Attention

One of the major accounts of attention in a technological context can be found in Martin Heidegger's tool analysis of *Being and Time* (1996) where he defines two types of relationships we have with tools—the ready-to-hand (*zuhanden*) and the present-at-hand (*vorhanden*).[5] These types represent the ways in which we are attentive to tools. Readiness-to-hand designates the phenomenon of not paying 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 presence and it becomes present-at-hand.[6] While there can be many ready-to-hand relations at the same time, i.e., to a hammer, a table and the surrounding workshop, multi-attention calls for the modeling of multiple present-at-hand relations that occur simultaneously.

In theory, the previously described models of attention could have accommodated multiplicity: the foreground could have consisted of more than a single object; a 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 to be present-at-hand. In this section I show how attention can be orthogonally configured for multiple objects. This mode of attention is named here multi-attention.

Multi-attention can be demonstrated by the works of the artist and philosopher Aim Deuel Luski who builds cameras with multiple lenses and holes. Figure 1 is the output of Luski's "lemon camera" depicting a pair of lemons from various points of view within a single frame. Similarly to Luski's presentation of multiple gazes, today's screens offer us a multiplicity of views by splitting the display into squares each showing a different content or perspective. From video surveillance control stations to sport event broadcasting, the split screen became popular for its ability to provide multiple points of view.

Deleuze and Guattari analyze the split in terms of schizophrenia. For them "schizophrenia [is] a positive process" that "is inventive connection, expansion rather than withdrawal. Its twoness is a relay to a multiplicity" (Massumi 1992, 1). Inspired by Deleuze and Guattari's terminology, multi-attention can be conceptualized as schizo-attention. Like the lemon camera, 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 and Guatari 1983, 38). The wandering in multiple directions fits the field construct proposed by Merleau-Ponty that denotes the free movement of attention in the figure-ground model. The schizo hints at the modus operandi of Merleau-Ponty's field, that is—the exploration of the world through endless splits, thereby becoming liberated from restrictive hierarchical orders (86). Becoming schizo is an effort to bypass the dichotomy of normality and neurosis. Correspondingly, Deleuze and Guattari's schizo-analysis is an attempt to develop forms of analysis in contradictory directions, such as the transcendental and materialist forms of

Figure 1: Aim Deuel Luski, A Pair of Lemons, Lemon Camera—concave view light (1978)

analysis (120). By the same token, schizo-attention develops in various directions, including contradictory ones, and transcends both the figure-ground dichotomy as well as the illuminated-dark illustration of the searchlight metaphor. Hence, the lemons depicted by Luski's camera are both figure and ground while being simultaneously illuminated from multiple perspectives.

Is there a limit to the multiplicity of splits of attention? I argue that such a limit exists but it is relatively high and can be heightened through training and exercise. That the limit is high can be learned from the Harry Potter book series. Although the books do not refer to attention, general principles of mental splitting can be found within them, ones which may inspire the development of multi-attention. 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 an act of magic which stores the resulting soul fragment in an everyday object, thereby turning the object with the soul fragment into a horcrux.[7] In the event that the body of the wizard is destroyed, he can use the horcrux as a means

of 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 united by the magical act of storing fragments of Voldemort's soul.[8] 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 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 lesson from Voldemort's horcruxes is that splitting has a cap and multiplicity should not be endless.

Outside the world of fantasy, splitting one's soul into multiple fragments is not highly practical or desired by the majority of people. However, splitting attention in order to simultaneously perceive scattered scenes or objects is likely an activity many people may find useful. For example, few would deny that talking on the cell phone while driving a car is a benefit. The usage of the cell phone enriches the experience of driving the car so that the total experience is greater than the sum of its parts. That is probably why 55 percent of respondents in a poll admitted they use their smartphones while driving, although many US states and countries prohibit this conduct.[9] The ability to communicate with others, receive traffic alerts and tips for the way, or even listen to music, is considered useful, even at the risk of getting a ticket.

Here it may be useful to use another variant of Deleuze and Guattari's schizo prefix, the "schizo body." It illustrates a body divided into organs, "waging its own active internal struggle against the organs, at the price of catatonia" (Deleuze and Guattari 1987, 150). Like the schizo-body, schizo-attention is a composition of attentions where each pushes in a different direction. Moreover, it shows us 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. Voldemort's horcrux suggests that this can happen when the number of splits is too high. Being aware of such consequences may help us to remain with a low-enough number of splits, thereby avoiding catatonia and enjoying the benefits of multi-attention.

The split of a faculty of mind is not a privilege reserved for dark wizards. Ordinary people regularly split their attention. Pilots do it. Parents do it. Even philosophers do it. Jean-Paul Sartre offers an example of experiencing pain in his eye while reading a book. He says, "The pain is neither absent nor unconscious; it simply forms a part of that distanceless existence of positional consciousness for

itself" (Sartre 1984, 440). As the pain reaches consciousness, Sartre's attention remodels and splits. He continues to read the book, but his attention is now divided between the here-and-now pain and the remote space described in the book.[10] The content of the book diminishes to some extent the consciousness "allocated" to the pain. Unlike the horcrux that divides the wizard's soul into independent units, the book prompts a redistribution of the total attention with dynamic links between the fragments. The book and the painful eye push in opposite directions. 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). This is a price most of us may be willing to pay for reducing pain even if reading the book is not as easy as it was before. With this trade-off, the total experience is more satisfactory. No wonder that dentists install televisions on the ceiling of their clinics so that the patients' attention is somewhat distracted from the teeth and the treatment.

Examining the role that reading a book plays in Sartre's example, I question how an artifact—a book in this case—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 but also help us split it.[11] Furthermore, even though we can split our attention without technologies (e.g., by simply looking around us), media technologies help us do so more effectively. Pain can be alleviated by various media technologies and their associated practices, such as reading a book, watching television, playing a game, hearing a story (in this context language is media technology), and using 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 a 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.

Luski's lemon camera, Voldemort's horcrux and Sartre's book reveal some important aspects of multi-attention. In this mode of attention, several splits of attention enable various points of views that enrich the experience of the world, as evidenced by Luski's lemon camera. Although the attention conferred to each object is slightly less, the whole is greater than the sum of its parts; however, too many splits might impair attention, as Voldemort's seven splits demonstrate. Lastly, Sartre's reading of a book exemplifies not only how the splits co-depend on each other, but also shows that media technologies can help us split attention more effectively.

It is hard to find references to plurality in the attention literature. Take, for example, the analysis in the field of attention economy, which studies the hypothesis that nowadays attention replaces money in the Internet economy (e.g., Crogan and Kinsley 2012 and the references there). Such an analysis is often focused on web sites such as Google and Facebook and does not deal with the situated body of a concrete Internet user, or with other possible attentions. This focus leads to a notion of attention that is restricted to social or economic relations (cf. Terranova 2012). By contrast, studying attention in a hybrid environment yields a form of attention that has a span covering not only the social and the economical but also the diversity of the surrounding world as mediated by various technologies.

Recently some accounts of multi-attention have emerged. Sebastian Watzl has developed a theory of multi-attention that results from an attempt to overcome the figure-ground dichotomy and the singularity of the searchlight. His solution calls for degrees of attention, encapsulated "in terms of how [a specific] experience is related to others" (Watzl 2011a, 158). Watzl employs an example of listening to music, where attention is focused on either the piano or the saxophone, yet remains conscious of both. He stresses, "it makes a phenomenal difference which one you pay *more* attention to" (Watzl 2011c, 723). Likewise, if while commuting by train or by bus, one's attention is focused on reading a newspaper, one is still attentive to the other passengers (2011a, 146). Attention, according to Watzl, should be regarded as a set of attentions given to several objects to various degrees and extents. Yet, these degrees and extents do not require the production of a hierarchy of foreground-background.

Postphenomenological Multi-Attention

While the figure-ground model of attention can be rooted in Merleau-Ponty's theories and the searchlight model in those of Husserl, multi-attention is still developing as can be evidenced from the pioneering work of Watzl. In this section I provide preliminary guidelines for an alternative foundation of multi-attention in postphenomenology.

1) Multistability, Pluriculture

Postphenomenology is a branch of philosophy of technology that merges Husserl's, Heidegger's, and Merleau-Ponty's phenomenology with James's and Dewey's pragmatism (Ihde 2009). At its core, multiplicity resides as explicitly expressed in the postphenomenological notions of multistability and pluriculture. The former stands for the ability of technologies to have different meanings to dif-

ferent people at different times (Ihde 1986; Ihde 1990; Rosenberger 2008; Hasse 2008; Goeminne 2011; Rosenberger 2012); the latter represents the variety of cultural resources involved in the construction of technological artifacts (Ihde 1990; Ihde 1993; Verbeek 2005) and provides "a perspective that treats diversity as a praiseworthy good" (Selinger 2008). Multistability can be evidenced in the private car: for some users is a means of getting to work; for some it is a means of bringing food and other goods to their homes; and for others it is an aid to putting their children to sleep. Multistability is also evidenced in the cell phone, which can be a communication device, a writing machine, a portable internet terminal, a music player, a gaming console and more. As for pluriculture, Don Ihde exemplifies it by a newsroom of a TV station where multiple screens show different scenes to be selected for broadcasting by the editor (1993, 64). The newsroom is a typical example of technologies that call for multi-attention as suggested in this article. Yet unlike the newsroom in which all TV sets are of similar size, in most cases multi-attention is not uniform and does not necessarily divide equally among all objects.

A technological device such as the cell phone does not necessarily require one's full attention, even if it "stands forward with the most significance" as Rosenberger describes in this special issue. Because we can split our attention, a conversation—either face-to-face or with the mediation of the cell phone—does not always require our fullest attentive arsenal. There is a difference between paying attention and concentrating: not every act of attention amounts to concentration. Driving, in particular, requires attention but not always concentration. Were it otherwise, we would not have been allowed to maintain a conversation with the other passengers, or search for a song or a radio station.[12] Likewise, not every phone conversation requires concentration. Were it otherwise, we would not have been allowed to talk on the cell phone while walking or while taking care of our children. However, some technologies do require the fullest attention, like a hammer used for pounding in a nail. If one's attention is not on the nail, a finger might get hit.

Therefore, I propose to distinguish between technologies that enable multiple present-at-hand relations and those which require a single present-at-hand relation, that is—maximal attention. My claim is that contemporary technologies enable us to interact with multiple objects and engage in simultaneous activities while traditional technologies are less tolerant to multi-attention. As we have seen for media technologies, the book as perceived in the nineteenth century called for a single attention (Crary 1999) while present-day computing technologies celebrate the multiple. In postphenomenological terms, this is the technological intentionality, that is—the phenomenon where technologies shape, control and determine the

ways their users behave (Ihde 1990; Verbeek 2005). When I'm holding a hammer my attention is unitary—usually on the nail I'm hammering. If my attention is not on the nail, let say I fall into daydreaming, my attention will pop back at a price (i.e., a hit on the finger). In contrast, contemporary technologies do call for splits of attention. Take the split screen of TV news programs, sometimes accompanied by a crawling line at the bottom; or the popular cell phone game "Fruit Ninja" in which constant flows of fruits come from various directions at the same time;[13] or a video-surveillance screen showing the inputs from several security cameras covering different areas and points-of-view.[14] Moreover, these technologies were developed with the idea of a viewer or a user who is not solely focused on them, but instead is engaged in additional activities. These technologies follow the horcrux logic, of splitting and multiplying our experiences, even at the expense of their strength.

2) Micro- and Macro-Perception

If a major ingredient of attention is perception (cf. Crary 1999, 24–25), postphenomenology can contribute to the understanding of multi-attention through the notions of micro- and macro-perceptions. Micro-perception is the component that is in charge of the sensual perceiving of an object; macro-perception represents the cultural-sociological-political aspect(s) of perception. The first covers the "bodily-sensory" elements of perceptions, the latter involves the "cultural-hermeneutic" ones (Ihde 1993, 87).

In a globalized world where cultures mix and converge, macro-perceptions are usually plural (Ihde 1990). Not only are macro-perceptions plural but so are micro-perceptions. We experience the world through more than one sense and the effort to isolate a "monosensory" experience, that is—a single micro-perception, is mostly theoretical and constructed for analytical purposes (Ihde 1998, 171). Even the critical voices against multitasking admit that combining more than one sense increases the efficiency of the impression on the mind (Carr 2010, 131). That is why it is acceptable to read a book while listening to music (I can only imagine the angry response of a Middle-Age abbot if one of the monks had suggested this practice instead of the then-common silent reading!).

Expanding multiplicity from the sensing act to the sensed object, my claim is that our senses can perceive more than a single target. Watzl's examples show how multiple inputs can be perceived through a single sense—the hearing of certain instruments in the case of a music concert or noticing other people when reading a book while commuting. The expansion from sensing to the sensed follows Ihde's postphenomenological analysis of scientific instrumentation, in which he identifies

multiplicity in every aspect of operation. He demonstrates how multiplicity occurs as new instruments emerge, and how each of these instruments detects more objects from more aspects and measures more qualities (Ihde 1998, 172–77). Our scientific instruments can perceive the world in multiple ways, viewpoints and perspectives, thereby following the human perception that is multiple and diverse. Hence, the micro- and macro-perceptions are multiple and so are their objects/targets.

3) Postphenomenological Relations

Additional dimensions of multiplicity can be found in postphenomenological relations. Ihde (1990, 2009) constructs the scheme of I-technology-world in order to identify four types of relations in which technology mediates the world for us: embodiment, hermeneutic, alterity and background.[15] Each relation is a permutation of the I-technology-world scheme. In embodiment the "I" and the technology become one perceiving unit of the world, as in the case of moving by car; in hermeneutic relations the technology and the world are the unit being perceived, like a GPS telling us where traffic jams are occurring; in alterity relations the world becomes the context and background for the technology which is treated as a quasi-other, as in the case of an automatic answering machine; and in background relations the technology operates on the "back stage," as in the humming of a car's engine.[16]

Each relation entails a different "flavor" of attention. The attention drawn to the embodied car is different from that paid to the cell phone as a navigation assistant (hermeneutic and alterity), which is in turn different from that given to the cell phone as a music player operating in the background.

Multiplicity can be spotted in the combinations of the relations. The relations we have with technologies and the world are multiple by their nature. It is for analytical purposes that we isolate one relation from the rest.

Different sets of relations produce different "flavors" of attention. Compare, for example, a fixed-line telephone and a cell phone. During a phone call each device produces different embodiment relations with its user: most fixed-line telephones require being held by the hand near the ear, while most cell phones have microphones, speakers and earphones to free the hands. Moreover, most fixed-line telephones are connected to a point in the wall, and even in their wireless version they need to be returned to a specific point (where the docking station is connected to the wall); in contrast, cell phones—thanks to their mobility—need no pre-determined point for communication and charging. This difference in embodiment affects their alterity relations: most cell phones accompany their users everywhere (including to the toilet and bed). Hence, even if a fixed-line telephone requires one's full attention

(as described by Rosenberger [2014]), it does not automatically imply that this is so for a cell phone. Because of these differences in embodiment and alterity, only some of the habits formed for the fixed-line telephone may be relevant to the cell phone.

If one ignores the difference in alterity relations and examines solely the difference in embodiment, a striking similarity arises between a fixed line telephone and a cell phone that is used as hand-held, and between a fixed-line telephone that is operated with a speaker and a microphone and a similar cellular handset or a hands-free car kit. But then how come a hands-free cell phone has the same effect on driving as a handheld cell phone, as Rosenberger claims? These two dramatically different embodiments should have yielded different forms of attention!

Additional multiplicity can be spotted in the embodiment relations a user may develop with her cell phone at the moment of receiving a call in public. Sadie Plant (2003) maps three types of responses, each with its own embodiment. The first type she names "flight," in which the user escapes from the surroundings and looks for a quiet spot; the second type is called "suspension," in which the user physically remains where she or he is, but stops paying attention to the surroundings, including suspending the activity conducted prior to the call (very similar to the behavior described by Rosenberger as sedimented cell phone usage); and lastly "persistence," in which the user remains an active participant in and with the surroundings while maintaining the phone call in parallel. The last type of response matches multi-attention as described in this article.

Furthermore, even if cell phone designers had in mind a certain usage mode, users have turned out to be inventive and have come up with new unexpected usage modes (Ihde 1999; Oudshoorn and Pinch 2003; Weber 2009). What is important is that there is no single behavior that can be classified as the only possible behavior. Moreover, a usage mode can change, even if it was "sedimented" through repeated behavior, as Rosenberger argues.

The postphenomenological relations can be experienced in the plural by the same person at the same time when interacting with various technologies in different contexts. For example, parents can mix embodiments of holding a fork in an effort to feed a toddler while talking on the cell phone. In spite of Rosenberger's lively description of the experience of talking on a fixed-line telephone, one's embodiment is not limited to staring at a shelf of books or a wall in order to make a phone call at the office. At the office, embodiment relations can be simultaneously maintained with a desk, a chair, a telephone, and a computer on which one plays solitaire while talking on the phone. (I admit that working on a paper is difficult when talking on the phone, but the clash is not rooted in the embodiment relations but rather in the

hermeneutic and alterity relations.) Background relations can also be simultane-
ously multiple when the voice of a roaring engine is accompanied by a cold wind
coming from the car's air conditioner. Here the vocal and the tactile form multiple
backgrounds that are co-experienced by the user. Even hermeneutic and alterity re-
lations can be experienced in their multitude at the same time. A driver can observe
the car's dashboard and the road signs (double hermeneutic);[17] this driver can also
talk on the cell phone and interact with the navigation system (double alterity).

The analysis of postphenomenological multiplicity provides us with tools
to approach questions concerning the combination of multiple technologies into
a single experience. Multistability and pluriculture remind us that different tech-
nologies have different meanings to different people, and that there are multiple
types of attention required by a given technology. The notions of micro- and
macro-perceptions reveal that an experience is composed of various perceptions
and involves more than a single sense. And postphenomenological relations, when
viewed from the multiplicity perspective, teach us that a certain technology can be
differently embodied by different users, can be performed in parallel to embody-
ing other technologies, and can be combined with other relations (i.e., alterity,
hermeneutic and background).

Driving While Talking on the Cell Phone

Multiplicity dominates the experience of driving a car as detailed by Stacey O. Irwin
in this special issue. In and of itself, the operation of a car involves embodiment,
hermeneutic, alterity and background relations, each invoking a different "flavor" of
attention. But driving is not confined to the interiority of the car; it is an action in the
world and so the outside calls for the driver's attention as well. Additionally, in the
car, attentions are also drawn to the other passengers, the radio, route directions and
traffic alerts from the navigation system, and phone calls and short text messages
coming from other people through the cell phone. All these create a pluricultural
environment rich in micro- and macro-perceptions entailing multi-attention.

The car can be regarded as a field that is composed of diverse components,
some of which are technological, some of which are other human beings. Con-
structing the car as a field requires an analysis of a hybrid that is composed not only
of a driver and a car which is "invaded" by a cell phone. It should also take into ac-
count the other passengers and the radio, which can impair driving. Kids in the back
seat or an aged relative sitting in the front do not necessarily share with the driver
the same "field of awareness" even if physically sharing the car's space. Rosen-
berger's notion of "field of awareness" is constructed in a limiting way; as a result,

it can contain only one activity centered around one technology. Once the number of technologies used rises to two, he warns us, impairment is likely to happen. This limit can be explained by the mixing of awareness and concentration; concentration is the focus of attention on a single object while awareness can be multiple as shown in this article. Removing the concentration limit may open exciting new horizons for the "field of awareness" as a new postphenomenological notion.

Rosenberger is not alone in identifying attention with concentration. Many of the critiques of multi-attention do so by blaming new technologies for distracting and distorting attention. These technologies include the television (Stiegler 2010), the Internet (Carr 2010) and the cell phone (cf. Rosenberger 2012 and the references there). The critiques have accused technology of switching attention between objects (as discussed in the searchlight metaphor) and have regarded such switching as the re-shaping of attentional forms. These accounts presuppose single-object attention and require concentration as a condition for best practices.

Recently proponents of the single attention model have tended to support their arguments by bringing compelling conclusions from cognitive science research. This tactic is known as the "neurological turn" (Crogan and Kinsley 2012). How can a supporter of multi-attention answer such strong solid scientific arguments? One way is to conduct a critical STS study that questions the hypothesis of such research and the conditions under which the research was performed, such as the assignment of people accustomed to silently reading books for a task that requires multi-attention. Such an approach further questions whether some experiments can be applicable to real life examples such as driving a car, because existing fMRI scans that are intended to study brain activity require the subject of research to remain motionless inside a large machine (cf. Hayles 2012, 66–68).

Another critical direction is offered by behavioral economics. Saurabh Bhargava and Vikram S. Pathania (2013) wonder how come the growth in cell phone ownership and in average minute use per subscribers in the years 1988 through 2005 in the US was not accompanied by a higher number of vehicular accidents. On the contrary, the aggregate crash rates have fallen substantially over this period. These behavioral economists reach the conclusion that using a cell phone while driving may be distracting, but it does not lead to higher crash risk.

Another counter-tactic for dealing with the neurological turn is to question the ability of the scientific community to reach an agreement upon the definition of attention (Watzl 2011b). Such an approach results in exploring a manifold of arguments united by no more than the aversion to contemporary technologies.

A fourth counter-tactic can be found in Catherine Malabou's *What Should We Do with Our Brain?* (2008). She elaborates on the concept of plasticity to describe the brain's ability to evolve into various directions and patterns. This, she claims, should be translated into a call for "an ongoing reworking of neuronal morphology" (Malabou 2008, 25). It is up to us to train and re-wire our brain in a manner that would support our beliefs, desires and ideologies.[18] Put differently, habits (or, as Rosenberger terms them, "habitually entrenched relations to technology" or "sedimentation") can be transformed. Just as we can acquire the relevant habits for driving, so we can acquire the relevant habits for talking on the cell phone while driving.

The narrow definition of sedimentation as "strongly entrenched habits" means we can never learn any new practice: wearers of eyeglasses should never try to switch to multifocal glasses, people who use the cell phone only for talking should never try texting, and judges should sentence all criminals to life imprisonment. Nothing in our behavior that is sedimented can be changed, according to this approach. However, psychologists and cognitive science researchers notice that "the most notable finding from the past century or more of research . . . is that humans have demonstrated some amount of learning in virtually every paradigm tested" (Green and Bavalier 2008, 692). Learning is broadly defined "as a change, typically an improvement, in perceptual, cognitive, or motor performance that comes about as a result of training and that persists for several weeks or months, thus distinguishing it from effects related to adaptation or other short-lived effects" (ibid.). Like Malabou's analysis of the brain, this branch of cognitive science sees the possibility of learning new practices, training for new skills and changing existing behaviors.

In line with Malabou's approach, this article calls for a fresh thinking that develops beyond the conception of single-attention wiring of our brains, a wiring that was optimized to previous media technologies, may they be books or televisions. In the age of the Internet and the cell phone, we need to practice multiple attentions. This is what we should do with our brains.

We can re-wire our brain to support multi-attention via playing video games. Cognitive scientists Shawn Green and Daphne Bavalier show that playing video games can improve the performance of various cognitive tasks, including the split of visual attention (Green and Bavalier 2003, 2006). Their findings may be expanded to other senses. Nicholas Carr cites a study that shows how the combination of visual and auditory cues helps people to remember more (Carr 2010, 131). Perhaps developing a game-like training that combines visual and auditory inputs can help drivers re-wire their brains in order to successfully drive and talk to passengers and interlocutors alike.

An interesting question is whether we can be trained to perform both multi-tasking and deep attention, that is—be trained to drive with multi-attention and later read an academic work under a single-attention (cf. Hayles 2012, 69–73). Here we can learn about the plasticity of our brain from a research study on the different brain wiring of people who read Chinese ideograms compared to those who read alphabetic writing (Carr 2010, 51). The fact that each group can learn to read and write in the other method may provide a pathway to combining multi-attention with deep-attention. Just as driving lessons are not limited to operating the car but also offer training in how to refer to road and traffic conditions, today another ingredient should be added—the operation of multiple technologies and the split of attention between the car, the outside, passengers, and technologies such as the cell phone and a GPS device. Such learning does not necessarily come "from nowhere," since many of us have already experienced splits of attention— as children watching TV while playing video games, as students in a class or as parents to young children.

Lastly, the analysis of car-driver relations should take into account statistics coming from American insurance companies which show that 62 percent of car accidents in the US in 2010–2011 were caused by drivers who were "generally distracted or 'lost in thought'" while only 12 percent were caused by cell phone use.[19] In other words, more car accidents are being caused by day-dreaming than by talking on the cell phone. Bhargava and Pathania's behavioral economic research puts such statistics in a wider historical context, covering the years 1988–2005, showing how the increase in cell phone usage while driving was not accompanied by a rise in the number of car accidents.

Summary

When talking about attention, several verbs can be used. Lately scholars have analyzed the use of the verb "pay" in the context of "attention economy" (e.g., Crogan and Kinsley 2012; Terranova 2012). In this article I examined other verbs and usages from a more everyday practical angle rather than a political one. When attention is used with the verb "focus," it usually refers to a single figure that is distinguished from a certain background, roughly equivalent to "concentrate." For example, I focus my attention on a conversation I conduct on the cell phone, while ignoring the surrounding environment. When attention is used with the verbs "shift" or "turn," it entails a searchlight that is turning towards one object and then towards another. I can turn my attention towards a cell phone conversation, and then towards the passenger next to me. In this article I showed a third way, possibly with the verb "draw," that allows the existence of multiple attentions,

like multiple lines composing a drawing. The example is driving while talking on the cell phone. The three modes of attention fit into a genealogical account of technologies, in which traditional technologies such as a book and a hammer best operate in a single attention mode, television and radio are optimized for the searchlight approach, and Internet and cell phones call for multi-attention.

While Husserl's and Merleau-Ponty's discussions on attention are engaged with a single object, my question takes the opposite direction, from the object to the adjacent objects. I ask about the possibility of drawing attention to talking on the cell phone while driving a car. The technological intentionality of contemporary artifacts such as the cell phone allows us to split our attention more easily, compared to traditional technologies and technics like reading a book or hammering a nail. I claim that our attention is wide and diverse enough to accommodate both actions, so that the whole experience is greater than the sum of the parts. Now it is our task to develop the suitable neural circuits in our brains to accommodate ourselves to the technologies that surround us. In other words, training programs would be an ideal tool to aid in developing a mechanism to help drivers cope with the multi-attention dictated by the technological artifacts that can be found in the car.

Notes

1. The latest examples are Watzl 2011b, Mole 2011, and Jennings 2012.

2. Objects are not pre-given, but neither are they changing. What changes is the recognition (Zahavi 2005, 90).

3. Art Bertman, "One Camera, Two Lenses, New Uses," *Display Daily* (July 22, 2011, http://displaydaily.com/2011/07/22/one-camera-two-lenses-new-uses/, accessed February 24, 2013.

4. Hayles does not refer to situations when deep attention can be harmful, as in the case of focusing attention on the act of riding bicycles (Dreyfus 2007, 9).

5. Joan Stambaugh (Heidegger 1996) translates *zuhanden* as "handiness" and *vorhanden as* "objectively present." In this article, I use the more common terms of "ready-to-hand" and "present-at-hand."

6. This is the common interpretation of the Heideggerian tool analysis (cf. Harman 2009, 2). Ihde proposes a different view in which the present-at-hand and the ready-to-hand are not dichotomies but rather complementary (Ihde 2010). He further suggests a positive interpretation of the present-at-hand (ibid.).

7. http://harrypotter.wikia.com/wiki/Horcrux (accessed June 1, 2012).

8. 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 and Guattari 1987, 34).

9. Jack Loechner, "Smartphone Addiction," *Research Brief* (July 22, 2013), http://www.mediapost.com/publications/article/204966/smartphone-addiction.html, accessed August 4, 2013.

10. Sartre refers to reading a book as an example of 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 not mix among consciousness, reflection and attention (Zahavi 2005), this example may still serve to clarify the split attention. Zahavi uses Sartre's case study to demonstrate a split of reflection and multiplicity of egos that transforms the experience of reading a book. My point of view is different. I look at the role of the book in constructing the experience of pain, instead of examining the structure of Sartre's consciousness.

11. Media technologies have the ability to attract the attention of the user. Once the user's attention is attracted, a split emerges between the immediate physical surrounding and a different space. That other space can be geographically remote as in the case of live news broadcasted on TV, or the interlocutor's space as produced through a telephone conversation or e-mail exchange; the other space can 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). In this article I seek to provide a basis for a split to more than two spaces simultaneously.

12. Since the early days of the car, partial attention was sufficient to drive; drivers' attention has always been split between the operation of the vehicle, the road, the landscape and other passengers. This is illustrated in F. T. Marinetti's "Futurist Manifest" of 1909 (http://vserver1.cscs.lsa.umich.edu/~crshalizi/T4PM/futurist-manifesto .html, accessed August 11, 2013).

13. http://fruitninja.com/, accessed January 26, 2013.

14. It is true that in many cases our gaze is fixed on one frame only, taking the others as background (or better—background objects as defined by Kelly, or having marginal awareness in Zahavi's terms). This explanation creates several levels of background, so the other frames become a major background, and the rest of the room becomes a minor background. Another explanation may be that the overall "collage" is being looked at (as in the case of security cameras), and the rest of the room gains a small fraction of the attention.

15. Peter-Paul Verbeek (2005) adds another three.

16. In Heideggerian terms embodiment and background relations can be classified as ready-to-hand, because in these relations technology recedes to the background; the remaining hermeneutic and alterity relations involve a more active role on the part of the "I" and are closer to present-at-hand relations. Although the designation of "present-at-hand" is reserved for situations when a tool does not function (i.e., is broken, missing or malfunctions) or to scientific investigation, there are positive everyday situations in which a tool does not withdraw to the background, as exemplified by

the alterity and hermeneutic relations. The levels of attention required in the various relations can be high, in the case of hermeneutic and alterity relations, or relatively low, in the case of embodiment and background relations. When Sartre reads his book, hermeneutic relations dominate, and minimal attention is paid to the clothes he wears (embodiment) or to the room where he sits (background), though another relation may arise from time to time as, for example, when he might need to clean his eyeglasses (embodiment).

17. An example of a double hermeneutic can be found in the work of vision scientist Srimant Tripathy and neuropsychologist Christina Howard. They refer to the case of football players who keep track of their teammates, opponents and the ball at the same time. This is a real-life case of what they call Multiple Trajectory Tracking (MTT): that is, the ability to report the properties of the trajectories of moving objects when observers are required to monitor several objects that are in motion at the same time (Tripathy and Howard 2012). Yet, the authors leave open the question whether MTT is a matter of multi-attention or a single-focus attention supported by tracking and memory mechanisms.

18. Maryanne Wolf, in her book *Proust and the Squid*, names this capacity "open architecture." Like Malabou, she emphasizes the brain's capacity to change and go beyond nature (Wolf 2007).

19. Erie Insurance, "Erie Insurance Releases Police Data on Top 10 Driving Distractions Involved in Fatal Car Crashes" (April 3, 2013), http://investor.shareholder.com/erie/releasedetail.cfm?ReleaseID=754063, accessed August 11, 2013.

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