

# The artifactual mind: overcoming the ‘inside–outside’ dualism in the extended mind thesis and recognizing the technological dimension of cognition

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**Abstract** This paper explains why Clark’s Extended Mind thesis is not capable of sufficiently grasping how and in what sense external objects and technical artifacts can become part of our human cognition. According to the author, this is because a pivotal distinction between inside and outside is preserved in the Extended Mind theorist’s account of the relation between the human organism and the world of external objects and artifacts, a distinction which they proclaim to have overcome. Inspired by Charles S. Peirce’s philosophy of mind, in particular, the author tries to find a way out of this ‘inside–outside’ fallacy. External objects, artifacts or processes should, according to him, not be conceived as inanimate and unintelligent matter utilised by a separately living, inner mental sphere that has set certain pre-established goals for itself. Mind has rather an *artifactual* character. It is not extended by an inner biological cognitive core but rather unfolds itself through objects and artifacts. Mind as such is, especially in our modern technological culture, shaped by virtue of and through technical artifacts. Recognizing this artifactual dimension of mind will, the author concludes, enable a more critical analysis of contemporary claims that ascribe certain original and irreducible features to thinking.

**Keywords** Extended mind thesis (EMT) · Artifactual mind thesis (AMT) · Inside–outside · Introspection · Technology · Peirce

“‘My pencil is more intelligent than I’, Einstein used to say.”

Karl Popper

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## Introduction

In their seminal essay ‘The Extended Mind’ (1998) Clark and Chalmers challenge the view that the demarcation of skin and skull determines the boundaries of cognition. They object, in other words, to the idea that what is outside the body is necessarily outside the mind. The separation of mind, body, and environment is, according to them, not evident but rather an assumption that requires justification. We cannot simply point to the skin and skull boundary as justification for the boundaries of cognition or the self, Clark and Chalmers say, since the legitimacy of that boundary is precisely what is at issue (see also Clark 2003, 2008).

In this paper I want to show that, although the Extended Mind thesis (henceforth: EMT) is a very interesting, fruitful and bold attempt to demonstrate how our cognitive system can contain external objects and technical artifacts, it is still parasitical on an ‘inside–outside’ distinction like the more conventional internalist views and more moderate externalist views of cognition, even though this is the very Cartesian worldview that EMT wants to overcome. Since the distinction between ‘inside’ and ‘outside’ is often explicitly or implicitly justified by the presumed capacity of introspection, I will demonstrate how not only opponents of EMT but also Clark and many of his friends, including so-called ‘second-wave EM theorists,’ still presuppose problematic aspects of introspection. Although cognition can be, according to EMT, extended by technical artifacts, an inner-outer dualism is, as I will show, preserved by ascribing to cognition an original starting point in an internal biological core, an inside that utilises the outside world in order to fulfil certain cognitive tasks that it has set for itself.

Inspired by Charles S. Peirce’s view of mind and his semiotics, I will propose a perspective that offers a way out of this thinking in terms of ‘inside’ and ‘outside.’ From this perspective, mind is not extended by objects and artifacts but rather unfolds through and is shaped by them. In this respect I introduce the term ‘artifactual mind’ and, what I call, the Artifactual Mind Thesis (henceforth: AMT). Acknowledging that our thinking has an artifactual character means recognizing that external objects and technical artifacts, rather than being utilised by an inside world, have shaped and are continuously shaping the very fabric of our thinking, of what we take to be our ‘inside world.’ Not only are thoughts exosomatically embodied but the specific physical characteristics of artifacts also activate new modes of thinking.

The primary goal of this paper is to explain how thinking is shaped by the objects and artifacts that surround us, which in the twenty-first century include, an increasing number of technical artifacts. Technology is recognized as a constitutive force that has a great impact on how we experience the world, as well as how we conceptualize ourselves.

By way of conclusion and as encouragement of further research in this direction I will also indicate how *awareness* of the artifactual dimension of mind enables a critical attitude towards reductionist claims that ascribe to thinking certain original and irreducible features. Although this final part of the paper can be considered as an appendix, I find it important to include it because it makes clear how AMT provides a means to address normative questions regarding the profound influence of artifacts and technologies on what we presume to be our deepest ‘inside.’

In the following sections I will, first, discuss in more detail Clark's EMT and his parity principle. By debunking the notion of 'introspection' I will, then, explain why I believe Clark's EMT, as well as 'second-wave' EM theorists, still presuppose a fallacious distinction between 'inside' and 'outside'. Next, inspired by Peirce's view of mind and his semiotics, I will elaborate how this 'inside–outside' fallacy could be overcome by an artifactual account of mind. In the concluding section of this paper I will show how AMT can make us more aware of the normative impact of technology and reductionist claims regarding thinking.

### **The extended mind thesis and the parity principle**

EMT should not be confused with the more modest view that external features of the environment can have a causal influence on cognitive processing in the brain. Clark and Chalmers claim that the human organism can be "linked with an external entity in a two-way interaction, creating a coupled system that can be seen as a cognitive system in its own right," which implies that "[c]ognitive processes ain't (all) in the head" (Clark and Chalmers 1998). Certain objects in the external environment are utilised by the mind in such a way that the objects can be seen as extensions of the mind itself. External tools can, according to Clark, become *transparent* in use, meaning that our intentions can 'flow' in such a way through technical tools that we feel as if they are part of us (Clark 2003, p. 123). Clark not only holds that cognition is not all in the brain but he also asserts that we have to revise our view of the individual as such: our selves do not coincide with our bodies but can be expanded to include non-biological parts and circuits (Clark and Chalmers 1998).

To explain when a coupled system can be conceived as a cognitive system Clark and Chalmers (1998) formulate a so-called 'parity principle': "If, as we confront some task, a part of the world functions as a process which, *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world *is* (so we claim) part of the cognitive process."

This parity principle has prompted different responses. Some critics of EMT (Adams and Aizawa 2001; Dartnall 2005; Rupert 2004) argue that the parity principle indicates a similarity relation between external and internal processes: if external processes are sufficiently similar to internal ones, then they can be considered as cognitive. It is easy to show, these critics claim, that external processes are not only very different but are also not susceptible to the same explanations as internal cognitive processes. Law-like regularities such as "primacy effects, recency effects, chunking effects and others" apply, according to Adams and Aizawa (2001, p. 61), only to processes found in the brain. 'Primacy effects' and 'recency effects' refer to the mechanism that given a list of items to remember, the first items (primacy effects) and the last items (recency effects) are remembered better than those things in the middle. 'Chunking' is a phenomenon whereby individuals group items when performing a memory task, for example by linking them to something that they easily can recall. When retrieving information via extensions such as notebooks or PDA's these characteristics are not displayed, which indicates that external processes are very different from internal processes. External processes should, therefore, not be considered as cognitive and the boundaries of cognition could be drawn at the skin

and skull of a person. EMT's coupling principle oversteps, according to Adams and Aizawa, the "mark of the cognitive," i.e., the fact that cognitive content is intrinsic and not based on any sort of social convention (2010, p. 73).

Friends of EMT (Menary 2006, 2009; Hurley 2010; Sutton et al. 2010; Sutton 2013), as well as Clark (2010) himself, argue that the parity principle does not say that an external process is cognitive if it is sufficiently similar to internal processes. The point of coupling is not to show that external objects have the same properties or as such are cognitive but rather that objects can become part of a larger cognitive system, such as a human agent. Pivotal for a process to be considered as cognitive is not its location or properties but whether it fulfils a certain cognitive *function*.

### **Challenging the notion of introspection and blurring the criteria of what it means to be 'internal'**

The opponents of EMT, as well as many other advocates of modern (neuro)biological approaches, clearly uphold a distinction between an inside world of cognition and an outside world of material objects but often claim that this 'inside world' is physically realized or constituted. Although Descartes would never have situated cognition in or reduced it to physical processes, since the body is also part of the *res extensa*, the division between 'internal' and external' that breaks along the line of the knowing subject is, as Rouse (1996) has pointed out, a cartesian legacy. This cartesian inheritance cannot only be recognized in the positions of opponents of EMT but also the advocates of EMT have, I believe, not sufficiently succeeded in escaping it. To demonstrate this and make preparations for my own thesis, I will elaborate in this section how the distinction between 'inside' and 'outside' has been justified and then challenge it. I will also explicate why in the shift from a cartesian dualism to a (neuro)biological framework, which is endorsed by most internalists, as well as externalists, a problematic 'inside–outside' distinction remains.

How does Descartes justify the distinction between 'inside' and 'outside?' His distinction between *res cogitans* and *res extensa* is based on the assumption that we have a direct and privileged access to the contents of our thoughts, which we lack towards the external world of material things. Since *introspective beliefs* about our mind are radically different from our beliefs about the outside world, our mind, Descartes claims, must be a completely different substance than the outside world, including our body. This would prove his dualism true (Descartes 1641/1985).

The debate about introspection, especially in analytic philosophy, is complex and the differences in opinion are great. Providing a full account of the different perspectives is in this context impossible, also because this issue is intertwined with the no less difficult questions concerning self-consciousness and the qualitative aspect of our subjective experiences. Offering a complete outline is clearly not my intention. I will instead briefly discuss a couple of relevant positions that problematize the notion of introspection in order to show which necessary steps have to be taken to overcome the 'inside–outside' distinction.

I will begin with a characterization of the term 'introspection' in the context of contemporary discussions. 'Introspection' usually refers to special methods or means that enable us to obtain knowledge of our own mental states. Different features are

ascribed to this faculty of introspection (see Macdonald 2007): knowledge of our own mental states seems to be *authoritative*, in the sense that if we think we are in a particular mental state that cannot be challenged. Knowledge of our own mental states seems also to be *privileged*, meaning that we know the contents of our own minds always better than we know the contents of the minds of other people. Another important feature that is related to introspection is *immediacy*. This notion implies that introspective beliefs, as opposed to perceptual beliefs, are non-inferential and non-evidence based.

The special, authoritative, privileged and immediate access to the contents of my own mind would, according to some authors, ensure infallibility, indubitability and/or transparency (see Gordon 2007). Beliefs regarding (some of) my own mental states would be, for example, immune from error because they are not inferred from any other beliefs or based on any other evidence (Russell 1910; Lewis 1946; Burge 1988).

Various philosophers from different perspectives have criticized both the features of introspection and the conclusions that are drawn from recognizing them. Some authors have attacked the alleged epistemic specialness of our self-knowledge by showing that our introspective judgments can be distorted by different confusing factors. Churchland (1981), for example, argues against the infallibility thesis by showing that we frequently make mistakes in our introspective judgments because of (false) expectation, method of presentation, and memory effects. I will briefly discuss a few other positions that in their critique of the idea of authoritative, privileged and immediate self-knowledge focus on how mental contents are determined by environmental factors.

Gilbert Ryle, who has strongly criticized the Cartesian idea of the mind as an independent entity, argues that introspective knowledge consists of applying words that we have derived from observations of behaviour of others to our own conduct: achieving self-knowledge requires, therefore, external cues. Self-knowledge and knowledge of other people are achieved in the same way, namely, by drawing inductive conclusions on the basis of observed behaviour. Ryle's critique of introspection results in rejection of privileged access (Ryle 1949). According to Dennett's theory of consciousness (1991, 2003) introspective expressions are the primary data gathered from research into consciousness and not what these expressions seem to refer to. There is no difference between consciousness as such and how we think about consciousness. Even first-person 'reports' of conscious episodes are gathered 'from the outside.' From Dennett's heterophenomenology there is no inner perspective from which we can compare self-conscious experiences with our judgments about them. Carruthers (2011) argues, along similar lines, that the idea of having authoritative and privileged access to our own mental states is untenable. Against this idea, he poses his 'Interpretive Sensory Access' theory of self-knowledge: all knowledge of propositional attitudes, whether those thoughts are our own or other people's, is dependent on sensory information that requires interpretation. Knowledge of our own thoughts is not different in kind from knowledge of the thoughts of other people.

Although Wittgenstein—the last author I want to discuss a little more extensively in this context—should be chronologically mentioned before Ryle, he represents perhaps the most relevant position regarding introspection for our thesis. Hutchinson and Read (2005) show in a fruitful reading of §1 of *Philosophical Investigations*, in the context of a discussion of Christopher Nolan's movie *Memento*, that positing an

inner realm does not provide the necessary conditions for understanding. A conception of mind as an inner realm is precisely that which is being represented externally in *Memento*. The film dissolves our appeal to an inner realm by showing how such an appeal does not give us sufficient insight into what is going on; nothing is gained from the move to an inner realm, just as we experience in Wittgenstein's therapeutic exercise in §1 (p. 84). This view is also in line with Gordon Baker's (1998) therapeutic reading of the 'private language argument.' Wittgenstein doubts if it is possible to develop in isolation a language that refers to one's own sensations (see Wittgenstein 2001, §244–§271). Baker attempts to show that the notion of a private language should not be read as intelligible but false, but rather as nonsense masquerading as an important possibility. According to Conant, the point of the exercise is not even to get us to see that there is something determinate to imagine which we are then supposed to see as a sort of thing that cannot be but rather "to get us to see that there is nothing for us to mean by the locution 'private language' that corresponds to what we, under the pressure of certain philosophical perplexities, want to mean by it." (Conant 2004, p. 187). This also indicates that, in contrast to Ryle, Wittgenstein's principal activity was not the clarification or correction of category mistakes. In conceiving thought as an inner mental activity we already go astray and in our attempt to try to think it all the way through, we ultimately discover that thinking and understanding are something different than we thought, namely: "To understand, having understanding, is being able to fully participate in the world with others" (Hutchinson and Read 2005, p. 86). Without certain rules or language games that regulate social practices our own thoughts would neither arise nor have meaning.

If both first-person 'reports' of conscious episodes and the knowledge of the thoughts of other people are dependent on external cues (Ryle), 'the outside' (Dennett), sensory information (Carruthers) or rules/language games that regulate social practices (Wittgenstein), then the very distinction between 'internal' and 'external' becomes opaque or the whole notion of 'inner' dissolves on us (see also Kirchhoff 2012, p. 292). And if what is internal to a cognitive system cannot be secured by referring to a special, authoritative, privileged or immediate access then also the individualist assumption of cognitive agency becomes questionable (see also Hutchins 2011).

Since the very notion of 'inside' is justified by the idea of introspection, challenging this idea will also have bearings on the view of the brain as a separate inside world. Taking the brain, instead of a Cartesian spiritual mind, as some kind of inner *homunculus* (or a multitude of *homunculi*) that instigates and regulates cognitive processes is difficult to justify, not only because the relation between brain processes and mental states is still a confusing enigma for us (this is the so-called 'mind-brain explanatory gap') but also because ascribing autonomous agency to the brain requires clear criteria that ensure the brain (together with its physically realized mental states) is a kind of isolated 'inside' that can be considered the locus of our self. The lack of clear criteria to establish what it means to be 'internal' to a cognitive system also greatly weakens the assumption that an individual's brain is an inner initiator of cognition, a kind of *causa sui*, that is independent from and should be categorically detached from external objects and artifacts.

## **EMT, second-wave EM theorists and the 'inside–outside' distinction**

### EMT and the 'inside–outside' distinction

Internalist opponents of EMT not only assume that the mind is physically realized but also believe that brain processes can sufficiently explain mental processes. Externalists claim that external observations are needed to know what we think and, thus, attribute a 'broad content' to mental states. Although in these views the mental contents of a subject and his/her access to these mental contents are dependent on aspects of the environment, those aspects are still, many externalists believe, situated outside his/her cognitive processes. Dretske's 'phenomenal externalism' is a clear example of this type of externalism (1995; cf. 1999). EMT defends an active externalism and states that technical artifacts can become a genuine part of a cognitive system.

If there are, as we have seen above, no clear criteria to substantiate what it means to be 'internal' to a cognitive system, then also granting an inside status to mental processes becomes highly dubious. This argument seems, on first sight, only to pose problems for internalists and modest externalists. I will, however, try to show that EMT has not sufficiently overcome the inside–outside distinction, which indicates that it also does not recognize the bearings of challenging the notion of introspection for the inside–outside distinction.

First of all, Clark's parity principle models cognition as something that goes on in the head. Although the outside world can take part in cognitive processes, external processes, in order to qualify as cognitive, have to correspond to or image mental processes that would normally take place in the brain. This condition is strengthened by the additional criteria that Clark and Chalmers formulate. Processes in the external world can only be included as part of an individual's cognitive process, if: (1) the resource is reliably available, (2) the retrieved information is automatically endorsed and (3) the information contained in the resource is easily accessible (Clark 2008, p. 79; see also Gallagher and Crisafi 2009, p.46). These criteria are reminiscent of the features that are traditionally ascribed to introspection: infallibility/indubitability, transparency, immediacy. Although cognition can be extended by an external object or process, this external object or process can only be included as part of an individual's cognitive process if it mirrors 'unextended' cognition (more about this notion later on), i.e. if the external resource or retrieved information is *infallible/indubitable*, *transparent* and/or *immediate*. This way the parity principle does not challenge but rather assents the inside–outside distinction.

Clark further prioritizes the inside brain world by taking what goes on in the individual's brain as the genuine cognitive agent. The idea that cognition arises from an inside world of brain processes is explicitly stated in Clark's latest book: "in rejecting the vision of human cognitive processing as organism bound, we should not feel forced to deny that it is (in most, perhaps all, real-world cases) organism centered. (...) it is the biological human organism that spins, selects, or maintains the webs of cognitive scaffolding that participate in the extended machinery of its own thought and reason." (Clark 2008, p. 123); "the organism (and within the organism, the brain/CNS) remains the core and currently the most active element. Cognition is organism centered even when it is not organism bound." (Clark 2008, p.

139); “Concerning the process of recruitment, it is indeed the biological brain (or perhaps some of its subsystems) that is in the driver’s seat” (2008, p. 122). Cognition has an original starting point in an internal biological core that then can employ external objects in order to realize certain cognitive tasks. Clark indeed partly decentralizes the cognitive agent by allowing external objects and processes to become part of the cognitive machinery. However, his individualist assumption of cognitive agency and admiration of the exceptional role of the brain in cognitive and physical activities largely prevent him from overcoming the “biochauvinistic prejudice” (Clark 2008, p. 77). Clark prioritizes the biological brain as the center of coordination and control. He isolates its activities from social dynamics and architectures, and identifies it as the spider that “spins, selects, or maintains the webs of cognitive scaffolding”. Clark even acknowledges that “conscious mental states might well turn out to supervene only on local processes inside the head” (Clark 2008, p. 79), which brings him close to the internalist perspective.

Clark’s prioritizing of an ‘internal biological realm’ is already expressed in the very notion of ‘extended mind,’ which implies that brain processes are a kind of *causa sui* that utilises, structures and manipulates external artifacts in order to fulfil certain cognitive tasks that it has set for itself (also Kiran and Verbeek 2010 pose this critique). The notion ‘extended mind’ indicates a movement from ‘inside’ to ‘outside.’ ‘Extended mind’ presupposes that there is also something like original or primary ‘*unextended* mind.’ The content of brain processes is granted an original, non-inferential, *unextended* status, an assumption that is parasitical on the idea that we have the capacity of introspection, i.e., that cognition can be localized in an isolated inside sphere that we can access immediately and that is not fundamentally affected by external influences. This isolated inside sphere is further secured by assuming that the relation between biological brain and world is in essence unidirectional. The brain is not substantially affected and altered by external material influences (see Clark 1997, p. 198). However, there are various studies that indicate that there can also be influence in the opposite direction: socio-cultural practices can reshape certain cortical areas of the brain or transform the brain’s representational capacities (see Näätänen et al. 1997; Wheeler 2004; Dehaene et al. 1999). These empirical results confirm that the idea of an isolated, ‘initial,’ non-derived inside realm is difficult to uphold.

In short, EMT commits the ‘inside–outside’ fallacy by unjustifiably presuming that we have an immediate, privileged access to the contents of our brains, which enables us to grant them a completely different status to that of outside processes. This presumption also prompts the view that an individual’s brain is an inner initiator of cognition and, therefore, can be considered as the locus of our self. Challenges to the assumed capacity of introspection, which makes this immediate access to a kind of isolated ‘inside’ possible, show that we lack clear criteria for the establishment of what it means to be ‘internal’ to a cognitive system. As a consequence, the very distinction between ‘internal’ and ‘external’ becomes opaque. The view of the brain as an isolated, inner initiator of cognition is also being disputed by empirical research that shows that socio-cultural influences can alter certain areas of the brain and the way it functions, which seems to prove the challenges to introspection right (I will further nuance this inference in the next section). By upholding the idea of a separate inside brain world Clark does not overcome but rather rehabilitates and modernizes the cartesian mind-set (see also Zahavi 2008).

## Second-wave EM theorists and the 'inside–outside' distinction

Although some so-called 'second-wave EM theorists' have defended a more nuanced interpretation of, in particular, Clark's parity principle, often an elementary distinction between inside and outside is maintained in their theories. Most of them emphasize that the intention of the parity principle is not to eliminate the distinction between the characteristics of internal and external processes, but to signal that internal and external processes can complement each other in the fulfilment of a certain cognitive task. Under certain conditions, both can become part of the same cognitive process.

Menary uses the term 'cognitive integration' for his thesis, which, according to him, expresses that "external vehicles and processes are integrated into a whole" (Menary 2006, p. 329). Menary problematizes the notion of 'intrinsic/non-derived' cognitive content (Menary 2006, p. 334–336), and stresses, referring to Peirce's Continuity Principle, that inside and outside cannot be discrete categories (Menary 2009). He also recognizes that external processes such as writing transform our cognitive processes (Menary 2007). However, he does not sufficiently explain in what sense then one can maintain the notion 'inside;' how overcoming the categorical distinction between 'inside' and 'outside' alters our view of mind (and matter); and under which conditions the features that today are attributed to this presumed 'inside' have emerged.

Sutton, another important representative of the 'second-wave EM theorists,' speaks of the "complementarity of disparate inner and outer resources" and focuses on how both contribute to more or less intelligent thinking and acting (Sutton et al. 2010, p. 524; Sutton 2008). Although he also recognizes the influence of external objects on cognition, the distinction that he makes still seems to presuppose that it is possible to account for an unmediated 'within.'

In another paper Sutton does anticipate a so-called 'third wave EMT,' which "dissolves individuals into peculiar loci of coordination and coalescence among multiple structured media [...]. Without assuming distinct inner and outer realms of engrams and exograms, the natural and the artificial" (Sutton 2010, p. 213). AMT's starting point is the dismissal of this distinction between inner and outer realms, since the criteria for what it means to be 'internal' are unclear, and might be part of this 'third wave EMT.' For this reason, it may be argued that AMT, rather than only contesting or refuting EMT, tries to make, by showing why taking a step further is important and necessary, a positive contribution to the EMT debate.

Overcoming the idea that cognition cannot be localized in an isolated inside brain world that functions as some kind of *causa sui* does not only require recognition that "[c]ognition leaks out into body and world" (Clark 2008 p. xxviii) but it also entails acknowledgment that cognition leaks in from the world into the individual's brain. Although AMT is sympathetic to approaches that validate this view and finds in them some confirmation, it does not only endorse the reciprocity between brain and world but also argues for their interdependency: the 'leaking out into the body and world' and 'leaking in from the world into the individual's brain' must not be conceived as a cognitive process traveling from one autonomous sphere (brains) to another (world) or vice versa. Without certain external rules or mechanisms we would, as Gallagher and Crisafi (2009) have argued, not be able to accomplish our thoughts. Cognition should be understood as a self-organizational process in which brains, bodies and

world simultaneously participate and depend on one another. Take away one of these parts of the cognitive process and “the system’s behavioural competence will drop” (Clark and Chalmers 1998, p. 9).

The (neuro)archaeologist Malafouris illustrates this intertwining of human and world by showing, for example, on the basis of the practice of pottery how the distinction between the mental and the physical disappears. Intentionality, according to him, is not the internal quality of the subject. Rather, the intentions of the potter are co-determined by the physical properties of the clay and the way they react to his actions (Malafouris 2008a, b). A different line of thought will bring me, as I will elaborate below, to a similar conclusion.

In the next section, I will use Peirce as my guide and positively elaborate on his philosophy that overcoming the idea that thoughts emerge from an original inside, which then utilises the outside world, not only discloses a radically different view of mind but also makes it possible to recognize the fundamental, *constitutive* influence of technical artifacts on mental processes.

## The artifactual mind

Peirce on mind as an inherent dimension of the world of objects and artifacts

Peirce’s characterization of actual conscious states goes with a kind of reversal of the Cartesian dictum: introspective impressions are, he states, not the most immediate and transparent form of knowledge but rather the most hidden. I quote: “Few things are more completely hidden from my observation than those hypothetical elements of thought which the psychologist finds reason to pronounce ‘immediate’” (CP 8.144). By depicting immediate introspective impressions as “completely hidden,” Peirce challenges the seemingly self-evident belief that we have a privileged access to a separate ‘thinking world.’ If there are no special methods to secure a separate ‘thinking world,’ than the quasi-cartesian propensity to situate mind somewhere inside our heads, in Peirce’s words, the psychological tendency to consider “each of us is like the operator at a central telephone office, shut out from the external world, of which he is informed only by sense-impressions” (CP 8.144), becomes also implausible.

According to Peirce, thinking is not instigated by such internal impressions but rather everything starts with what he sometimes calls “percepts,” which are “out in the open.” Peirce repudiates the idea that we have *immediate* access to our ‘inside realm’ and a *mediated* access to the outside world. That is why he can say: “It is the external world that we directly observe” (CP 8.144). Thinking is not instigated by ‘introspection’ but by ‘extrospection.’ Although in this reversal Peirce still uses an inside–outside distinction, his argument ultimately culminates in a kind of collapse of that distinction. By depriving introspective knowledge of ‘immediacy’ and ‘transparency’ the criteria for what it means to be ‘internal’ are blurred and, hence, the very distinction between ‘internal’ and ‘external’ becomes opaque.

To further clarify Peirce’s perspective, I quote another passage from the same text: “We first see blue and red things. It is quite a discovery when we find the eye has anything to do with them, and a discovery still more recondite when we learn that

there is an ego behind the eye, to which these qualities properly belong. Our logically initial data are percepts” (CP 8.144). The (phenomeno)logical *sequence* is here of great importance. The percepts that instigate the cognitive process precede for Peirce every possible distinction, including a distinction between ‘inside’ and ‘outside.’ That we attach to percepts a subject with a brain is something that logically (Peirce makes a distinction between a psychological and a (phenomeno)logical perspective) takes place afterwards. We should not reverse this sequence and presume that meaning and thought are located in, let alone produced by an inner brain world. Peirce’s repudiation of introspection has a phenomenological basis. All other less basic disciplines, including ethics, logic, metaphysics, and the sciences, are dependent on the elementary findings that phenomenology offers.<sup>1</sup>

Peirce stresses, and this is crucial, that these percepts have a mental character. This, however, does not mean that they are products of individual brain processes. Indeed, “[t]hought is”, according to Peirce, “not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world; and one can no more deny that it is really there, than that the colors, the shapes, etc., of objects are really there” (CP 4.551; see also Watts 2008, p. 190, 191, 199, 201). Our world of objects and artifacts does not only consist of matter but also of mind. This is almost hyperbolically expressed in a footnote of a text from 1884: “just as we say that a body is in motion, and not that motion is in a body, we ought to say that we are in thought, and not that thoughts are in us” (Peirce, CP 5.289, n.1; see also Aydin 2007a, b). If we are immersed in thoughts and the world is saturated with mind, the very distinction between an, ‘inside world of human mind’ and an, ‘outside world of material objects’ becomes obsolete.

A question that could be raised in response to this view: if mind is so fully pervasive of the universe, what is the principle of individuation that allows us to talk of minds and selves in the plural? It must be clear that Peirce’s perspective does not allow for a unique, pre-given inside as the principle of individuation. In his most anti-individualist writings the individual is for Peirce no more than a privation: “Psychological analysis shows that there is nothing which distinguishes my personal identity except my faults and my limitations” (CP 673). We discover ourselves as distinct selves if we are not able to sufficiently connect to our environment. Peirce’s aim is, however, not the destruction of the individual but rather the situation of the individual within a broader whole. A self develops a particular identity by virtue of his or her very empirical interactions and continuous attempts to govern and regulate them by certain social habits, which enable him to adequately respond to his or her environment. Although I cannot further elaborate this argument in this paper (see Aydin 2009 for Peirce’s view of individuality), it indicates again Peirce’s belief that we are not detached, atomistic egos living in a separate inside world but “cells of a social organism” (CP 673), who discover and develop themselves in an interaction with their environment.

To get a better grip on Peirce’s not easily accessible view of mind as an inherent dimension of the world of objects and artifacts, I will briefly discuss another

<sup>1</sup> Peirce termed, probably independently from Husserl, his overall approach as “phenomenology.” Later he uses the notion “phaneroscopy” for his method. See Aydin (2007a) for a comparison between Peirce’s and Husserl’s phenomenology.

philosopher whose ideas bear an intriguing resemblance to Peirce's view of mind, namely Karl Popper. According to Peter Skagestad (1993, 1999), Popper's account was directly influenced by Peirce's philosophy.

### Popper on exosomatically held knowledge in objects and artifacts

Popper explained the process of human evolution as a development of new organs outside our bodies, organs such as tools, weapons, machines, and houses. He was especially interested in memory enhancing artifacts and writes in that context: "Yet the kind of exosomatic evolution which interests me here is this: instead of growing better memories and brains, we grow paper, pens, pencils, typewriters, dictaphones, the printing press, and libraries. (...) The latest development (used mainly in support of our argumentative abilities) is the growth of computers" (Popper 1972, p. 238–239). Popper held knowledge to reside not in mental states but rather exosomatically, in books, articles, and the like. He emphasizes that it is a fundamental mistake to understand books and articles as only the outwards expressions of knowledge that is 'really' residing inside the human mind.

Exosomatic knowledge is for Popper inherently dispositional: material objects have the potentiality to bring about certain states of mind. He writes: "It is its possibility or potentiality of being understood, its dispositional character of being understood or interpreted, or misunderstood or misinterpreted, which makes a thing a book. And this potentiality or disposition may exist without ever being actualized or realized" (Popper 1972, p. 116). Although a book is only a book if it is readable, it would potentially still be a book even if it were never to be read.

Objects and artifacts can be, in Popper's view, potential carriers of knowledge and meaning (Popper 1972, p. 107–108). If this is recognized, then it becomes easier to expect that objects can shed more light on the human mind than the psychological features of mental states. In Popper's words: "Contrary to first impressions, we can learn more about production behaviour by studying the products themselves than we can learn about the products by studying production behavior" (Popper 1972, p. 114). The products of the human mind teach us more about its evolution than its psychological features.

Popper stresses, like the proponents of EMT, the importance of the mind-expanding function of artifacts. In that context, he writes: "we use, and build, computers because they can do many things which we cannot do; just as I use a pen and pencil when I wish to tot up a sum I cannot do in my head. 'My pencil is more intelligent than I,' Einstein used to say" (Popper 1972, 225, n. 39). In contrast to EMT, Popper emphasizes that the collective knowledge that dwells in objects and artifacts is relatively independent of particular individuals. The knowledge that resides in books, libraries and museums is not an extension of what goes on in an individual's brain but rather a cultural creation that has become independent of its particular creators.

This way Popper is able to situate knowledge in objects and artifacts. Unfortunately, his view does not sufficiently overcome the distinction between an, 'inside world of human mind' and an, 'outside world of material objects,' as is evident in his 'Three Worlds' theory. The objective, abstract world of knowledge and ideas (third world), which is situated in and carried by material objects (first world), is only

*relatively* autonomous, meaning that it is independent from separate particular human minds. Although the development of scientific theories can lead to unintended consequences, it remains the world of the products of a collective of *human minds* (second world). In addition, the human mind is a prerequisite for actually interpreting and grasping the third world of objective knowledge.

Although the knowledge that resides in material objects can become independent of its creators, Popper's material objects seem to function merely as passive *knowledge storage*. If mind would be an integral dimension of objects and artifacts, however, they would be able to function as genuine epistemological agents. What is not sufficiently accounted for by Popper is the dependence of thought on the very physical characteristics of its carriers. Popper's viewpoint is for this reason, as Paul Levinson claims, still "too primarily ideational" (Levinson 1988, p. 79): it is the human mind that generates and is the ultimate source of knowledge, which then can be stored in material objects.

To explain how the knowledge that resides in material objects is not the sheer product of a separate world of human minds and how its material carriers can play an active role in the generation of cognitive processes, I will in the next subsection, after having explained the relation between percepts and signs, briefly elaborate what signs are and how they work. It should be clear that my purpose here is not to provide a general description of Peirce's semiotics—which would be a very complex, maybe impossible enterprise, since Peirce has continuously revised his thoughts on signs (see Robert Marty's *76 Definitions of The Sign by C. S. Peirce*, 1997). In the last subsection, I will finalize my account of the artifactual mind.

### The 'factual' mind: Peirce on percepts and signs

In the "[Peirce on mind as an inherent dimension of the world of objects and artifacts](#)" section, we have seen that for Peirce the cognitive process is initiated by percepts, which are 'out in the open.' Percepts are "the data of all knowledge" (CP 8.300). As "the first premisses of all our reasonings" they prompt a certain reaction, which is, according to Peirce, "utterly beyond control" and even "cannot be called in question" (CP 5.115f). We see here again a kind of reversal: the cognitive process is not generated by what traditionally is called the 'subject' but rather what traditionally is called the 'object.' If the very concept of introspection is unsustainable, Peirce believes, we have to understand thought as something 'factual.' In Peirce's words: "It appears (...) that there is no reason for supposing a power of introspection; and, consequently, the only way of investigating a psychological question is by inference from external facts" (CP 5.249).

Although percepts are 'factual,' our access to them is always limited and designates a certain provisional stage in our comprehension. We only have certain representations of these 'facts,' which Peirce calls 'signs.' Without signs cognitive processes could not be brought about. I quote a longer passage: "If we seek the light of external facts, the only cases of thought which we can find are of thought in signs. Plainly, no other thought can be evidenced by external facts. But we have seen that only by external facts can thought be known at all. The only thought, then, which can possibly be cognized is thought in signs. But thought which cannot be cognized does not exist. All thought, therefore, must necessarily be in signs" (CP 5.251). Only through signs do we have access to the world. That, which cannot be represented by

signs, does not (yet) exist for us. Although Peirce still uses, as mentioned earlier, the distinction between internal and external, his concept of ‘sign’ is an attempt to overcome the mind-matter dualism and, hence, the cartesian inner-outer distinction. He sometimes uses in this context the notion ‘objective idealism’ for his view (see CP 6.24; 6.25; 6.163).

It must be clear that percepts and signs are analogue. If we want to understand how percepts generate cognition we have to interpret them in terms of signs. That is why Peirce can say: “Percepts are signs for psychology” (CP 8.300). Although Peirce understands cognition, in a similar fashion to Popper, as something potentially residing in the ‘factual’ world, he does not conceive it as something that is produced by a separate world of human minds and can be stored in objects and artifacts. Cognition as ‘semiosis’ is for Peirce a process that is brought about in and by virtue of our engagements with the objective world around us. To better understand this ‘bringing about’, we have to briefly reflect on what signs are and how they work.

In 1897, Peirce defined a sign as: “something which stands to somebody for something in some respect or capacity” (CP 2.228). A sign has a triadic character: (1) “It addresses somebody, that is, creates in the mind of that person an equivalent sign or perhaps a more developed sign.” Peirce calls this “the interpretant of the first sign.” (2) “The sign stands for something, its object.” (3) “It stands for that object, not in all respects, but in reference to a sort of idea” or “quality,” which Peirce sometimes calls “the ground” of the sign (CP 2.228; cf. 5.283).

To illustrate this triadic character of a sign, I give a simple example: one day I discover that one of my suits has holes and infer that there are moths in my wardrobe. The holes are a sign that represents the moths (the object), and instill a certain idea (an interpretant) in me, for example “damn moths.” The set of particular qualities present in the sign (the ground of the sign) determine which interpretant is produced. They schematize the object so that it can be interpreted by some sign agency in a certain way. Signification is, in other words, dependent on, in this case the very physical elements of the holes: the scattered shape and the small size of the holes are primary to the sign’s ability to mediate between object and interpretant. The interpretant is in turn a sign, capable of further sign production, in myself (“my 500 euro suit is ruined”), or should I want to utter it, in other selves. If I utter it, it could, for example, produce in the mind of my wife the interpretant “these are not moth holes, you silly fool, but cigarette burns; *you* have ruined your suit.” This example also shows that each sign is what it is by virtue of its possible future ‘interpretants,’ which implies that “the meaning of a thought is altogether something virtual” (Peirce, CP 5.289).

There are two aspects in the sketched semiotic process that are relevant for our discussion. The first aspect is that the sign process is not generated by an inner realm of a subject but is determined and constrained by an object. The term ‘interpretant’ should not be confused with ‘(human) interpretation.’ That a sign has to be suitable for interpretation means that the sign itself must have such a shape and structure that it can produce a specific interpretant in a certain (in this case a human) context. It does not mean that the interpretant is dependent on human consciousness, let alone that it is produced by it. Indeed, to prevent this possible misinterpretation, Peirce sometimes uses the term ‘quasi-mind’ to describe the locus of the interpretant, and omits any reference to human being and human consciousness in his definition of a sign. I quote: “a Sign has an Object and an Interpretant, the latter being that which the

Sign produces in the Quasi-mind that is the Interpreter by determining the latter to a feeling, to an exertion, or to a Sign, which determination is the Interpretant” (CP 4536). The sign production is instigated by an object, which functions as a kind of *causa finalis* that prompts investigation. This investigation consists of properly recognizing and collecting the signs that the object produces and disclosing a certain structure or regularity, which enables ever better understanding of the object.

The claim that even without some person interpreting a sign, thoughts could be produced, is part of Peirce’s non-anthropogenic view of thinking and might be too extreme and difficult to prove. It does, however, maximally stress the tenable view that the world around us plays an active role in instigating thought. We find meaning in the world rather than creating it. Thought and meaning are not brought about by a presumed private inside but are generated in our engagements with the objects around us. Even knowledge of ourselves is not acquired by a presumed ‘introspection’ but requires collecting signs and figuring out what they represent. The following passage from Wittgenstein, which could have been written by Peirce, expresses this very nicely: “But if you say: ‘How am I to know what he means, when I see nothing but the signs he gives?’ then I say: ‘How is *he* to know what he means, when he has nothing but the signs either?’” (2001, §504). For both Peirce and Wittgenstein, thinking is the activity of operating with signs (Wittgenstein 1958, *The Blue Book*; see also Baker 1998).

The second aspect that is important for our discussion is that thoughts are not only exosomatically embodied but that the specific physical characteristics of this embodiment also determine to a great extent *which* (type of) thoughts are induced. How a sign is brought into connection with its object and which interpretant is being produced, as a result of that, is greatly dependent on its specific physical embeddedness. This brings me to the last part of this section.

## AMT

The idea that mind is an inherent dimension of the world as such makes its specific material embodiment not less but more relevant. In a famous, and still very relevant, passage from 1905 Peirce tries to show how thoughts are determined by the worldly objects around us: “A psychologist cuts out a lobe of my brain (*nihil animale a me alienum puto*) and then, when I find I cannot express myself, he says, ‘You see, your faculty of language was localized in that lobe.’ No doubt it was; and so, if he had filched my inkstand, I should not have been able to continue my discussion until I had got another. Yea, *the very thoughts would not come to me*. So my faculty of discussion is equally localized in my inkstand” (Peirce, CP 7.366; my italics). The point that Peirce wants to make here is of course not that ink is the only possible means to utter his thoughts. More importantly, Peirce does not want to show, contra EMT, that he utilises ink to reach certain goals in a more functional way. Thought is not something that emerges from an inside and is, functionally utilising external objects, extended to an outside. Thinking is an activity in which the brain participates along with the eyes and the hands and a multitude of devices, including, in this case, ink.

The proposition “the very thoughts would not come to me” in the quoted passage indicates, and this is crucial, that ink plays not a passive but an active role in inducing certain thoughts. In and through the act of writing with ink and by virtue of the

specific physical characteristics of writing with it certain thoughts are triggered. Without ink *those* thoughts would not have emerged. Conceiving thought not as an internal state of mind but as a process that takes place ‘out in the open’, allows for ascribing to objects a thought generating capacity. In his article ‘Logical Machines’ Peirce claims along this line that “it is no figure of speech to say that the alembics and cucurbits of the chemist are instruments of thought, or logical machines” (Peirce 1887, p. 168). Artefacts such as alembics and cooking pots evoke a very specific way of thinking in the chemist. The mind itself is evoked through and shaped by the very material characteristics of its carriers. The mind has an artifactual character. Although from our human perspective thinking would always require some engagement between an artifact and an organism, Peirce’s non-anthropogenic view that all reality is saturated with mind necessitates him to entertain the possibility of semiosis without humans.

Here again we find striking similarities with Wittgenstein, who writes: “It is misleading then to talk of thinking as of a ‘mental activity’. We may say that thinking is essentially the activity of operating with signs. This activity is performed by the hand, when we think by writing; by the mouth and larynx, when we think by speaking; and if we think by imaging signs or pictures, I can give you no agent that thinks. If then you say that in such cases the mind thinks, I would only draw your attention to the fact that you are using metaphor” (1958, p. 6f).

In AMT, the external world does not consist of dead matter that is utilised by thoughts that emerge from an inside world. The repudiation of the inside–outside distinction implies that there are no purely physical objects that are operated by a separate, purely mental faculty. That is why the term ‘artifactual mind’ is, I believe, not only more suitable than ‘extended mind’ but also more appropriate than ‘external mind.’ ‘external’ still presupposes ‘internal,’ which is a distinction that the proposed perspective wants to overcome. Moreover, I prefer ‘artifactual’ to ‘artificial’ because ‘artificial’ is too strongly connoted with ‘unreal’ and does not express the ‘out in the open’ character of mind.

‘Artifactual Mind’ expresses that our thinking is not pre-given or naturally present in a presumed inside world but that it unfolds itself by virtue of and through objects and artifacts (cf. Wittgenstein 2001, §16). It is crafted and shaped by physical things. For that reason, mind can be an object of archaeological or anthropological research (see Schick and Toth 1993, p. 49; see also Hilpinen 1993, p. 156f). From an artifactual perspective, thought is located in a world of objects, which are no less mental for being ‘out in the open,’ and no less real for being mental (cf. Skagestad 1999, p. 557).

Our thinking is facilitated or impeded by specific physical features of objects and artifacts. We do not instrumentally use objects and artifacts to express ourselves or reach certain goals. Rather objects and artifacts enable us to induce and develop certain thoughts. Dependent on their physical features, objects and artifacts, which are in our current time ever more technical artifacts, can disclose, to borrow a Heideggerian term, the world in a certain way. The physical characteristics of the artifacts that we work with also determine to a great extent which goals are pursued and how they are pursued.

This view is also neatly expressed by Engelbart (1962, p. 26): “Brains of power equal to ours could have evolved in an environment where the combination of artifact materials and muscle strengths were so scaled that the neatest scribing tool

(equivalent to a pencil) possible had a shape and mass as manageable as a brick would be to us—assuming that our muscles were not specially conditioned to deal with it. We fastened a pencil to a brick and experimented. (...) How would our civilization have matured if this had been the only manual means for us to use in graphical manipulation of symbols? (...) The concepts that would evolve within our culture would (...) be different, and very likely the symbology to represent them would be different (...) It thus seems very likely that our thoughts and our language would be rather directly affected by the particular means used by our culture for externally manipulating symbols.” Technical artifacts, such as pencils, books, and computers, are not neutral tools for the more efficient execution of intellectual projects antecedently conceived and adopted; rather, technical artifacts inform our choices of which intellectual projects to adopt and thereby transform our conception of what we are doing and even of who we are (see also McLuhan and Fiore 1996; Ihde 1990). Artifacts are not neutral tools that are functionally utilised by an internal biological core, as expressed by EMT; rather they shape to a great extent what we consider as our ‘inner,’ mental realm of goals, aspirations and ideals.

## Conclusion and further implications

### Recapitulation

EMT has contributed a great deal to the view that the external environment not only can influence cognitive processes but rather that external objects and artifacts, which are, especially in our modern, Western culture, ever-increasingly technical artifacts, can become a very part of our cognitive processes. According to EMT, certain objects are utilised by the mind in such a way that they become extensions of the mind itself.

Instead of immediately adopting or rejecting the EMT, I have tried to show that, despite significant differences, both opponents and proponents of EMT have one thing in common: they do not sufficiently challenge the pivotal distinction between inside and outside. This reflection has led to an analysis of the concept of ‘introspection,’ since the distinction between inside and outside is often (implicitly or explicitly) justified by the presumed capacity of introspection. Different arguments against the epistemic validity of introspective judgments ultimately culminated in an overall rejection of the idea that thinking should be situated in an inside world; whether that is in the *res cogitans*, a realm beyond the empirical world, or, as in more modern materialist approaches, in the brains. Inspired by especially the philosophy of Peirce, I have argued that thinking has not only an exosomatic character but rather is instigated by and unfolds through external objects and technical artifacts.

AMT evidences that a persistent inside–outside fallacy often lies at the heart of the failure to recognize a more fundamental, constitutive influence of external objects and processes on cognition. External objects and technical artifacts are not dead matter utilised by a separate living, inside sphere with the aim to realize certain pre-established goals but rather mind itself is induced and shaped by these artifacts. Mind is not extended by an inner biological cognitive core but rather unfolds through objects and artifacts.

## Further implications

In an attempt to encourage further research in this direction, I will end with a critical comment that arises from the *awareness* of the idea that thinking is artifactual. I am conscious of the fact that, in accordance with AMT, the medium that I use (language signs, word processor, physical features of my laptop, etc.) also greatly facilitates this awareness and influences the way it is articulated. Another complicating factor is that, if I want to remain faithful to Peirce's non-anthropogenic view of thinking, strictly speaking I cannot say that this awareness arises from 'my internal insight' into thinking but rather that the mind becomes aware of itself, of what is constituting it and has constituted it. We can recognize in this respect similarities between Peirce's view of thought and Hegel's 'Phenomenology of the Spirit,' similarities of which Peirce himself was very aware (see Aydin 2007a, b). The questions that are prompted by these self-referential deliberations, however, I leave out of consideration. I just assume that this *awareness* and, hence, a critical attitude towards the way thinking has been conceived is *possible*.

As my starting point, I take again the EMT discussion. Opponents of EMT believe that mental activities are expressions of organic brain processes, which display specific and characteristic mechanisms, such as primacy effects, recency effects and chunking effects. These typical features indicate, they believe, that cognitive processes are intrinsic and not reducible to external, social processes. The inner world of cognition has, they say, features that are completely different from external processes, which indicates that cognition is brain bound.

AMT can reveal that this 'inside–outside' distinction does not take into account the history of such terms and, hence, reflects a 'short-term memory.' A genealogy of concepts such as 'sequence,' 'listing' and 'grouping,' which are presupposed in notions like 'primacy effect' and 'chunking,' can provide insight into how these terms can be traced back to technologies such as reading, writing, and calculating and the artefacts employed for those activities (pens, calculators, computers). Without the development and ubiquity of these technologies, today we would not interpret cognitive processes exclusively in terms of processing information and 'processing information' would not be understood in terms of the above concepts. It is also no coincidence that notions like 'primacy effect' and 'chunking' are studied in the context of a more or less well-*functioning* memory. The functionalist character of modern technologies determines to a great extent our view of memory (see Donald 1991). My goal is not to deny that our thinking is subject to certain mechanisms, but to indicate how old and new technologies have continuously inscribed their 'grammar' into what is considered the natural, non-derived mark of cognition.

Clark's insufficient liberation from the 'inside–outside' distinction prevents him from seeing how much his view of cognition is determined by our technological era. Although he partially locates cognition outside the brain, he, at the same time, upholds this distinction by ascribing to cognition an original starting point in an internal biological core, an inside that utilises the outside world in order to fulfil certain cognitive tasks that it has set for itself. Within this framework Clark interprets the mind in terms of all the way down functionalist terms, without taking into account that this characterization is

already an expression of the current technological vocabulary (cf. Selinger and Engström 2008). 'Computation,' 'processing,' 'modularity' and 'functionality,' which for him ultimately characterize what cognition is, are not neutral, self-evident, and irreducible notions but part of the technological mind-set that we have incorporated in our modern era.

The 'inside–outside' fallacy not only obscures the fact that our understanding of cognitive processes has a history, but also 'neutralizes' the methods and technologies that grant us insight into those processes. Today, not only cognitive processes but also biological properties are described in an information technological and functionalist idiom, often referring to the newest technologies that are used to make brain processes visible and measurable. Neuroscientists who draw a direct and causal relation between brain states and cognition can then claim to have immediate access to our thoughts. Victor Lamme, for example, writes that an MRI scan grants us "a glimpse into someone's mind" and that we finally will be able to "measure what someone sees with his mind's eye" (2010, p. 264; see also Lamme 2006). The relation (type-identification) that is drawn between processes in the brain and mental states is, of course, very problematic, as extensively discussed in the philosophy of mind. But that problem is not my focus here. What I want to demonstrate is that the technologies that we use to understand the patterns and structures of what we consider our 'inner,' whether that is our mind or our brains, are often 'overlooked.' They become indeed, as Clark states, *transparent*. However, this transparency of artifacts comes with the risk of disregarding their profound influence. This was no different in the past. Even Descartes interprets his *cogito* (unconsciously) in light of the technology of his time when he compares the subject to a homunculus inside a camera obscura, i.e., an autonomous spectator (Kockelkoren 2003, 2007). Our view of what we consider as our 'inner self' is closely linked to the technologies that we have invented, to which we have adapted and that have become a structural part of our modern life (see also Tenner 2003).

By locating the functionalist features of cognition in an alleged independent and irreducible inside brain world, it becomes possible to understand mind as such exclusively in terms of instrumental problem solving or the enhancement of information processing functions. In this way the technologies that have generated this type of thinking are kept out of sight. As a consequence, a fundamental criticism of the functionalist framework is no longer possible, since all technology, as well as the thinking that it facilitates, is solely evaluated on the basis of the greater efficiency with which it enables us to carry out familiar tasks. By depriving cognition of its original, non-derived and independent features (the 'mark of the mental'), situated in a presumed inside, and recognizing how this functionalist framework was developed under influence of certain technologies, it will become possible to evaluate technologies and the thinking that they have generated not exclusively in terms of efficiency. It then also becomes possible to address another, more fundamental question: what is the value of particular technologies in terms of the type of thought that they evoke for our lives? How should we evaluate the mental realm of goals, aspirations and ideals that those technologies trigger and shape? The AMT does not exclude normative questions but rather places them at the center of our attention.

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