Joel West*

Mnemonics as signs of memory: semiotics and agency

https://doi.org/10.1515/cogsem-2023-2002
Published online May 12, 2023

Abstract: This paper engages the question of the extended mind hypothesis, specifically in terms of memory and mnemonics. I use the case of an external object which is set to trigger a memory internally, but is not the memory, to explore the idea of extension versus distribution. I use the example of *tzitzit,* which is a garment worn by observant Jewish men, where is states in scripture that seeing the tassels attached to the garment are supposed to trigger a specific memory. The point of the essay is that extension is merely a metaphysical commitment, and that this commitment leads to some ethical issues.

Keywords: agency; ethics; extended mind; memory; mnemonics

1 Introduction

One of the current debates in the philosophy of mind is the question of situatedness, the question of where exactly the mind lives and where it is that cognition occurs. Three of the major positions are Internalism, the stance that cognition occurs solely inside the body and specifically in the brain (Adams and Aizawa 2009), the theory of Distributed Cognition (DCT), where tools may be used to aid cognition but are themselves merely tools but in themselves do not have agency (Giere 2004), and Extended Cognition (ExCT), in which the location of an individual and the manner in which they cognate might include temporary linkages to external agents which are in themselves active (Clark and Chalmers 1998). Clark and Chalmers' famous example of ExCT using Inga and Otto relies on the idea of memory exists as a cognitive function, and that while the primary agency of cognition may occur in the brain that the cognitive work, so to speak, may be "offloaded" onto affordances in the environment. "Cognitive offloading refers to the act of reducing the mental processing requirements of a task through physical actions like writing down information or storing information on a cell phone or computer." (Morrison and Richmond 2020) Cognitive offloading can lead to greater efficiency and ease stresses of remembering things, especially when there are many

***Corresponding author: Joel West**, Institute for the History and Philosophy of Science and Technology, University of Toronto, Toronto, Canada, E-mail: joel.west@mail.utoronto.ca, http://www.joelwest.com

individual items to recall, or when performing rigorous tasks such as finding the logarithm or square root of a number. We may even offload already offloaded material, where we copy written addresses from a "phone book" into a cell phone contact list. The question that situatedness asks, is if offloaded cognitive tasks belong to the self doing the task or if they belong to the machinery doing the task or to put it another way, when I do arithmetic on my cell phone, am I cognizing via my cell phone. The thought here is that my cell phone and I form a single unit whereby, I may be merely cognizing using my cell phone. However, in this case, the division of entities is strictly demarcated; I am not my cell phone. Furthermore, when a person saves information or reminders to a cell phone, modern philosophical arguments problematize the issue by acknowledging that the information is mine and is personal but then question if somehow the stored information and the phone itself metaphysically becomes part of me, even though it is located in an object outside of my body. Our phones and laptops offer features such as "personalization" so that we can modify the look and feel of the experience of using them, and much of our memories, such as birthdays, phone numbers and appointments, amongst other things, exist on these devices, so that some philosophers suggest that it may well be needful to demarcate between where the owner of the device ends cognitively, and where the device begins (Clark and Chalmers 1998; Wheeler 2019). There have even been legal challenges where a court considered if assaulting a cell phone might in some way be the legal equivalent of attacking the owner's body or brain (Carter and Palermos 2016). Going forward then, we then need to demarcate where the mind and cognition exist and where the self as a body ends,

Toward this question, I have chosen the case study of mnemonics and mnemonic devices. Mnemonics are "any device or technique used to assist memory, usually created by forging a link or association between the new information to be remembered and information previously encoded." A common example of a mnemonic is the letters of the word "face", which spell the word meaning visage, but depending on context, may also stand for the musical notes of the spaces on the treble clef. What makes F A C E a mnemonic, is:

1. I need to know that I want to remember the notes of the treble clef,
2. I need to know the mnemonic itself, and
3. I need to have somehow forged a cognitive link between the mnemonic and the memory.

Just seeing the word "FACE" is not sufficient for the letters to be a mnemonic if a cognitive link between the notes of the treble clef has not been associated with the mnemonic as a link to the memory to which it points. It is notable too, that, this kind of mnemonic is not private since it is often taught by music teachers to their students.

Mnemonics may also be a kind of private speech, where it may be a cognate of "thinking aloud" where it serves as a way for the individual speaker to bolster their own thought, but they may also serve to remind members of a group enforced practice. private speech is "spontaneous self-directed talk in which a person "thinks aloud," particularly as a means of regulating cognitive processes and guiding behavior." (American Psychological Association 2022) Private speech, in this sense may also be a form of cultural scaffolding whereby cultural norms and ideas are bolstered, such as in the case of some practices or dress, as we will see below. The point here is that mnemonics are not in themselves memory, merely pointers[1] to other memories even though they themselves are stored in memory. It is for this reason that mnemonics may be a form of Vygotskian scaffolding rather than a form of cognitive extension.

When it comes to their empirical location, mnemonics may be embrained or embodied and be private or public, such that only the person who is recalling the memory may know what it is that they are trying to recall or they may be cultural, however, private mnemonics may exist completely outside of the body entirely, and still not necessarily be a part of ExCT. Mnemonics may also be public, where these public mnemonics are also conventional and exist only for specific in groups. The point here is that while cognition certainly may transcend the embodied and embrained modalities, and may even exist outside of the body as extended or distributed, that mnemonics and memory when existing outside of the brain may be distributed not extended and may act as a kind of scaffolding. When we try and account for the example of tying a string around one's finger to recall another something, it is possible to use ExCT as an explanation, however, their account leads to ethical issues which are not present in the idea of DCT. It is not needful to commit to cognitive extension to account for mnemonics. As part of this paper, I will also suggest that ExCT, as proposed by its proponents, removes agency and subjectivity, really the humanity, from human cognition. Furthermore, I also propose that the ideas of functionalism and the parity principle are in themselves problematic, and that the idea scaffolding resolves these metaphysical issues. Instead of ExCT, perhaps the environment does not think with the thinker but that it instead supports cognition.

My roadmap for the rest of this paper is as follows: I will first define some of the terms I am using and I will then explain the current arguments in the field. This delineation and clarification will also include a Peircean pragmatic approach to mnemonics as signs. I will also argue mechanistically, but I also want to make it clear that my use of mechanism is merely metaphoric; it is a poetic comparison, not a

1 In computer programming a "pointer" is a variable which serves as a reference to the memory address of another variable.

statement of fact just as Carl Sandburg's fog does not actually "come in on little cat feet," or "look out over the harbour." (Sandburg 1916) I will then look at the so called "parity principle" from a pragmatic and subjective point of view and here I will argue that parity really does not exist, that it is an existential, rather than metaphysical commitment based on an attempt to view subjective phenomena from an objective viewpoint. In the next section of this paper, I then argue that "coupling" as described by ExCT is very much an issue of agency and a metaphysical commitment where, *ad absurdum*, we begin to give agency to inanimate objects, just because we use them. Before I conclude, I also argue that parity, as defined, compares working systems with broken ones. I am not contending that we do not thing with the environment, nor that we do not use the environment as tools, but instead that there is a clear demarcation between who we are and what our environment is, and that to confuse this boundary may be a problem.

2 Some arguments and definitions

The argument for the extended mind is a cogent one and has many allies where the world is "made mental" and where external resources aid cognition and that the adherents to these ideas "suggest that human cognitive systems include those resources that are importantly, robustly, reliably or persistently supportive of decision making." (Sterelny 2010, 466) This is one model via which we may understand the ways we store information and process and understand the sensorium around us, where the environment is part of the mind, and more than merely beings tools to aid us think are metaphysically part of a larger whole, where mind can actually encompass the aids we use to help us think. The example often given is the one of Inga and Otto, where Otto requires a notebook for directions where Inga just knows how to go (Clark and Chalmers 1998). To contrast, Kim Sterelny compares this idea of extension to the idea of scaffolding, which he calls "an alternative that equally accepts the centrality of environmental resources to human intelligence." Sterelny's view of scaffolding is such we also use external resources, just as externalism does, without the need for metaphysical commitments and with better compatibility with current evolutionary science. While Sterelny's position alleviates some of the ethical objections to parity and functionalism, which will be discussed below, he still does not account for the way it is that we actually do cognition nor does he account for meaning making in cognition. This is not to state that externalism is itself wrong, but that using Sterelny we then do not have to make any metaphysical commitments to external cognition as proposed elsewhere, just to externally supported cognition but that we still need to account for meaning making in cognition.

So, while an externalist believes that at least some cognition occurs as part of the environment and in the environment, a cognitive internalist believes that cognition ends at the human brain or body such that there is a Cartesian divide between self and other. This divide is between the thinking, knowing self which is metaphysical and the body and others (Descartes 1988). Proponents of this belief include Fred Adams and Kenneth Aizawa (Adams and Aizawa 2009) where they circumscribe all cognition to the brain alone. This is not to say that they are solipsists who deny any external environment but rather that this environment is completely cut of from the mind, which exists completely in the head and brain. Compare this idea to DCT, the thesis that we use tools in kinds of chains and in kinds of networks to allow ourselves greater access to more information which might normally be available to us (Giere 2004). According to Ronald Giere, these tools may do some cognition of some sort but that have no agency unto themselves; rather that these tools allow us to receive and to disseminate information that might not normally be available to our bodily sensoria. "The result is that we should think of distributed cognitive systems not as completely unified wholes, but as hybrids including humans as the only cognitively active agents." (Giere 2004) The system does work but these parts are "actants,[2]" where actants exist as part of the network, but that the only part of the network with agency is the human part. As Juan Carlos Mendoza-Collazos notes, this relationship between actor and actant is asymmetrical (Mendoza-Collazos 2021) with the ethical burden residing on the actor part of the network. So, my contention is that the locus of cognition itself is not limited to the brain however agency is limited to may well be an illusion of the Cartesian self. Other actants may bring information to the brain or may help to process or to disseminate information in a distributed sense but they are limited in the manner in which they are ethically part of the actor – actant network. As an example, Giere offers the idea of networks where a telescope in space records information and processes it, sends the information to a satellite which in turn sends the information to a computer on Earth which then digests the information into a human readable form (Giere 2004). Some actants, such as satellite telescopes and Mars rovers, may even store directions and have limited decision making capabilities and this limited decision-making power is based on decision making capabilities which may appear to be agential, but which have been granted them via humans. Importantly, the border between the mind and the

2 Bruno Latour has borrowed the term "actant" from A. J. Greimas' narrative theory, where an actant has a functional role in a scientific narrative, but not an agential one. The actant is an element which helps us complete a narrative, without itself being an ethical agent where, in terms of narrative, a murder cannot be committed without a knife, so the knife is not an agent but an actant, but it is still possible to tell the story from the point of view of the actant. As an example, the scientist is important to a narrative, but so is their laboratory, where the scientist is an agent and the laboratory is an actant in the narrative (Latour 1996, 1999)

environment is ethical, not physical, whereby agency defines where the mind begins and ends, and where agency happens with the human operator.[3]

A third way of understanding cognitive situatedness is ExCT, which involves the inclusion of one's environment as part of the cognitive process in a far more active sense such that the locality of agency is not limited to being situated in the brain or in the Cartesian self, but instead, that the mind and agency are both extended using cognitive tools and offloading cognition onto these tools. Such tools may include a large computer with artificial intelligence but may be as simple as a pen and a paper, to do arithmetic. This kind of extension includes distribution as described above, so, as an example, a telescope would extend seeing, and a satellite telescope would greatly extend seeing further, but rather than being distributed tools, these tools are seen as agential themselves. Note then that all extended distribution is distributed, but not all distributed cognition is extended. In the aforementioned example of Inga and Otto, both wish to go to the museum, but Inga has use of cranial memory and Otto must use external memory, in this case a notebook. The issue here is that ExCT claims that there is parity between the use of Otto's notebook and Inga's memory. Parity, as used this way, means that an extended process may be called cognitive if it is functionally equivalent to a process that happens intracranially (Clark and Chalmers 1998), but it is important to note that no one has decided on what is a good delimiter for equivalence. Clark and Chalmers do not define mind or cognition, except that for them cognition seems to describe a set of computations which occur in the mind whereby we understand things, and do tasks and also describes the manner in which we somehow store and retrieve memory. Clark and Chalmers also contend that parts of the environment may be just as active or even agential in these cognitive process as the brain whereby this externalism is "active." (Clark and Chalmers 1998, 7) There is a question of delimitation and of demarcation here, where there is no delimiter or demarcation where and when the mind starts and ends. If we then propose that memory is part of the mind, we then need to be able to account for different kinds of memory, especially those that exist outside of the head.

This problem leads us to the question of mnemonics which are a specific cognitive tool. The question of how mnemonics are situated is interesting only because they may exist inside our brains internally, such as the use of a private phrase, or outside of our brains externally, as in the use of *tzitzit* the fringes that Orthodox Jewish men wear on an undergarment to trigger a specific memory. Furthermore, some of these explanations may be functionalist where inner mental states are not included as part of the manner in which they work. Functionalism may be defined as "the doctrine that what makes something a thought, desire, pain (or any other type of mental state) depends not on its internal constitution, but solely

3 For more on this question see Mendoza-Collazos (2021).

on its function, or the role it plays, in the cognitive system of which it is a part." (Levin 2021) Inner mental states only matter so far as they cause an action; hunger is only important if it causes the action of eating. Accordingly, inner states are not important to functionalist theories; the human and the machine are both black boxes and what matters is the results, so from the example above, it doesn't matter why Otto or Inga go to the museum, or even via what means they go to the museum, all that matters is that they do go to the museum and that they subsequently succeed in arriving at the museum. While we presume that they want to go to the museum but why they might want to go, the manner in which they actually get there, or even in what state they arrive, is immaterial to the functionalist argument.

To link these ideas back to memory as a function, and specifically to mnemonics we should note that there are several kinds of mnemonics, all of which are conventional. This is to say that mnemonics do not have a one-to-one resemblance or correspondence with the memories which they represent. A one-word notation in my planner or calendar such as a name may be meaningful to me, in that it reminds me that I need to buy flowers for my partner on the way home, but for others the notation is out of context may not hold meaning for anyone else. A literary example appears in Walter Miller's post apocalyptic science fiction novel *A Canticle for Leibowitz,* when a post-apocalyptic Catholic monk who is doing penance discovers an ancient text that has been inscribed with the words "Remember– pick up Form 1040, Uncle Revenue." (Miller 1959, 49) We know that the novel was written for a mid 20th century audience, and since Miller was writing to be understood by this audience, this phrase is easily understood by his intended readers, which presumes they are literate and American, so as to understand the reference to taxation documents. As Miller notes, however, to somewhat comedic effect, in a post apocalyptic future the words themselves might be meaningful, but the cognitive content, which is conventional and cultural, may have changed so as to be meaningless. While the note was written to be read, and may well be read by anyone, it was also written to be understood by a specific person in a specific circumstance and the semantic content of the note is obfuscated by time and cultural changes. The intended reader would also need to know the context and to be able to read past the conventional meaning of the words to parse an encoded secondary meaning, which is based in cultural and temporal context. Because of these reasons, mnemonics and their meanings must also exist in a kind of context to be meaningful where if they are in public, they are polysemous. A shorthand note to self like the example from the novel, is a kind of private mnemonic. It exists to be read and understood by a single individual at a single place and time. Similar mnemonics could include a string around the finger; the code of such a private mnemonic is meant for a specific individual in a specific circumstance, to recall a specific thing.

There are also public mnemonics, and these exist in a public context and represent these memories conventionally. The colour red has no meaning unto itself, but if one were to create a red hexagon, we would say it "means" stop, but only in those cultures which have stop signs. The meaning of the red hexagon is then a conventional sign which also points to another idea and which reminds one to stop. Another example is the *tzitzit*, which exist specifically to be seen, as a reminder of a phrase from the Hebrew Bible: "That shall be your *tzitzit*; look at them and recall all the commandments of יהוה (G-d) and observe them, so that you do not follow your heart and eyes in your lustful urge." (Num 15: 38) To further contextualize the meaning of this verse, this line is part of a passage of scripture that is read aloud at least twice a day, every day, by observant Jewish men. A cognitive link between the passage of scripture, the reminder to remember and the tassels is certainly forged, which as above is the very definition of mnemonic. The idea is to wear the *tzitzit,* and specifically to see them and then to recall the next task which is specifically to remember the verse which commands the wearer to remember the tzitzit and to observe the commandments;[4] the *tzitzit* exist specifically and only to be seen and the sight of them exists only to trigger a memory that might not otherwise be conventionally related to the *tzitzit*. The *tzitzit* are not themselves memories, they are reminders to remember something else, a specific memory, and as such are a kind of mnemonic device where this mnemonic exists in plain sight but is only meaningful to those who have forged the requisite cognitive link.

2.1 Mnemonics as signs

To be effective, mnemonics must be remembered and so are also kinds of memories themselves, but, given the definition above, these memories merely represent other memories. As such, mnemonics are signs in the Peircean sense where according to C. S. Peirce:

> A sign, or representamen, is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea, which I have sometimes called the ground of the representation. (Peirce 1982, 56)

A mnemonic, although a kind of memory, is just a sign of another memory which it resembles by deixis and by convention. The viewer sees the *tzitzit* and remembers

4 Orthodox Jews believe that the Hebrew Bible contains 613 commandments.

the verse; the mnemonic memory creates in the mind of the recipient an equivalent sign, not an equal one, and one that may be more developed so that as such these memories may not be identical to the memories they represent; they are equivalent and not equal. Similarly, as above, the letters FACE are not the space notes of the treble clef, they represent them. We may say then that while a mnemonic may indeed trigger a memory that exists in memory it only represents that other memory by pointing to it as an indexical sign.

Peirce also defines a taxonomy of signs: the icon, the index, and the symbol. And icon represents by "likeness" which represents "via a community in some quality," so that an iconic sign represents by resembling its object ins some manner (Peirce 1982, 56). Indexes are those signs "whose relation to their object consists in a correspondence in fact" which is to say that the index points to the existence of its object. Finally, symbols are those signs "whose relation is an imputed character" which means that the relation between a symbol and its object is conventional. So, "A photograph of me points to my existence and it also resembles me and is therefore both iconic and is also indexical. The color "red" requires a cultural context for it to signify and therefore we can say it is a symbol; a red octagon means stop, by convention." (West 2019b, 11) A green hexagon does not mean stop, only a red one does. A mnemonic is therefore a Peircean index as it points to the existence of a memory, and it is a symbol since it is also conventional. The letters "FACE" do not look like the notes on a treble clef, nor do they sound like them, yet they represent these notes all the same, and they do so symbolically and indexically. We might note that there is an overlap where a sign may be both iconic and indexical, or some other combination or as Albert Atkin notes:

> In any case where more than one of the three elements is present, one will be most prominent. Consequently, we can think of Peirce's trichotomy as dividing signs according to whether they are predominantly iconic, indexical, or symbolic. (Atkin 2010, 367)

Mnemonics are more predominately symbols but also serve as indices since while they do point at other memories, their meaning is carried in conventional representation. In general, while a mnemonic may be iconic in the Peircean sense, iconicity, or resemblance, is not a requirement for mnemonics since for the most part the mnemonic itself is indexical and also points to the memory that we wish to retrieve.

2.2 Memories as kinds of objects

Memories may be regarded as kinds of artifacts, or, as computer scientists would call them, data objects. Other data objects could include such objects as computer data

files, like word documents, spreadsheets, and jpgs, and also the operating systems as programs and computer programs. These objects may be stored on hard drives, on thumb drives, or other media. Functionally these data objects and our memories are similar, in the sense that they both need to be retrieved to be used, are otherwise stored in a manner that makes them retrievable in some way and also may be made irretrievable. If we use the common functionalist and computationalist metaphor that the brain is simply a sophisticated computer made of meat components,[5] then we can treat memories in the brain and memories in a computer as similar objects[6] where, as above, our silicon-based computers have several different kinds of memory which function differently:

1. Reserved memory which is exclusively where the operating system runs,
2. Dynamically allocated memory where programs run and to where data is manipulated
3. Storage memory where the computer stores programs and files temporarily.

Computers boot up from the hard drive and store the operating system first. They then read data from the hard drive, or from other storage, from its own temporary memory or from other inputs such as keyboards, mice, or joysticks, and they then file this data into dynamically allocated memory locations. This data is allocated and filed temporarily via a system of what is called "pointers." When a computer program needs to know where a piece of data is it looks to the pointer, which then provides the memory address where that data is placed. Computers can also store pointers into memory and here I am proposing that a mnemonic is similar to this kind of pointer, such that it the mnemonic points to a pointer which then points to a data object, the memory we want to retrieve. The staff of treble clef notes point to F, A, C, E just as the letter point to the notes. Seeing the *tzitzit* points to a passage in scripture which in turn points to a command to do something. While the actual data in the brain may be stored completely differently than above, the metaphor of mnemonic as a kind of pointer is apt, since pointers may also be stored into memory so that a pointer may point to another pointer which may point to another pointer in associative memory, like a kind of cascade of memories.

As above, computers also read data that may be input from the outside, when, in the old days a punch card was input, or a floppy disc, or today a thumb drive or even from a mouse, or keyboard, or joystick. Notably, when a computer program reads

5 I should make clear that this is merely a partial metaphor which stands for the thing but is not the thing itself.

6 While some may note that above I object to functionalism, I need to make clear that I have no issue using functionalism as a descriptor of the thing it resembles, but I do object to stating an identity that the two are the same. A car may function like a bus, but a car is not a bus, and the differences may be as important as the similarities.

files to process, we do not consider those files to be part of the program, we consider the data to be separate from the program. The spreadsheet is separate from Microsoft's Excel; we say that the program reads the files, and plausibly we can use other computer programs, such as Google Sheets or Libre Office Calc, in this case, to open the same spreadsheet. We say that we input data for the computer to manipulate, and we say that program reads and manipulates the data and then outputs other data. Moreover, this is only true if we are printing out a photograph of someone or playing a video game. The data and the program are two different things, where the Xbox is not the game. To take this argument further and to go back to Clark and Chalmers' famous example of Inga and Otto, Inga knows how to go to the museum by wanting to go to the museum and by willfully having her brain read the data that is stored in another portion of her brain. She then manipulates that data to send herself walking to the museum (Clark and Chalmers 1998).[7] According to Clark and Chalmers' account of the way that parity might work, we could presume, based on our reading, that one part of Inga's brain stores the data, which in this case is the spatial data along with the various steps and alternative routes which are required as part of the directions to travel to the museum, along with possible contingencies which might cause her to have to detour. To continue this mechanistic metaphor, we might then presume that another part of her brain retrieves and parses that data and decodes it and then selects from the data at the very least the beginning part of the route of going to the museum, keeping in another part of storage, the routine of going to the museum. We may say that what Otto does when he reads his notebook to "know" how to go to the museum is similar to what Inga does, and that functionally the two are doing equivalent things, and I will agree that they are equivalent in terms of the results in a *prima facie* sense. I will even agree that a specific memory, in this case the directions to the museum, may be stored in Inga's brain and in Otto's notebook in an equivalent manner, although in Otto's case it is probably more like a recipe or a set of steps in order, where in Inga's case it may be a selection of alternatives both of which lead to arrival at the museum. The manner in which the two function is ultimately equivalent, where in strict in functionalist terms we would say that they are equal, however, while Inga's and Otto's memory systems may work in a similar manner from a functionalist perspective, their experiences may be extremely different from a subjective perspective. This subjective experience is not important to functionalists and is an issue which I will discuss further below.

7 This simple task, knowing how to go to the museum, is actually quite complex. It is not just knowing how to go as it involves spatial manipulation amongst other issues. As such this task may be broken down into many more steps than just "going to the museum."

3 Pragmatics and the subjective: a trip to the museum

As noted above, mnemonic is not the memory, it points to, or indicates the memories, as a Peircean indexical sign. Mnemonics may also be personal, cultural, or public, and are therefore, also, Peircean symbols, which represent their object conventionally. It is important to note that these mnemonics are symbols that are meant to be interpreted conventionally, but also in a specific manner so it is important to read a mnemonic correctly so that mnemonics must be unambiguous. In the case of a mnemonic, we have a sender who sends a message, or a sign, via a communication channel and at the far end we have the receiver. While it is the role of the sender to send a sign in as clear a way as possible it is also the role of the receiver to attempt to understand the sign in its own context, where the sign and its meaning relate to each other in an asymptotic[8] manner, so that there is a split between a sign, the mnemonic, and its meaning the memory (West 2022, 40–2). A mnemonic is not the memory, it represents the memory and is a memory aid because it then points to something else that then points to the memory. Mnemonics point to specific understandings or to fields of understandings which the person who is remembering is free to interpret in a contextual manner. While a particular mnemonic may have many valid readings, some of those readings are going to be fraught. We are free to interpret things the way we wish so that, as an extreme example, we can say that the Marquis de Sade's *120 Nights in Sodom* is children's literature, but we must also then be responsible for those interpretations (West 2022, 40). While theories of semiotics and interpretation are beyond the scope of this work, we need to remember that mnemonics are objects which may be physical or stored in memory that point to other memories, so that they also must also then be interpreted.

A proponent of ExCT might counter that at the very least these physical objects are just a kind of extended memory. Given the example of an alarm from a timer going off, they might even argue, for example, that a mnemonic is a representation, so that when we hear the alarm, that the alarm is part of an extended cognitive system that includes the alarm and also the datum to which the alarm is linked, or they might say "coupled," so as to create a single unit. They might continue with the following analogy: Computers have both reserved memory and dynamically allocated memory where they store programs and data in dynamically allocated memory registers. When a computer program needs to know where a piece of data is it looks to the pointer which then provides the memory address. There is no difference between a mnemonic and a pointer, that they both exist in memory, and

8 An asymptote is a line which approaches a curve but never meets it.

both point to a different address in memory. Some of these mnemonics are in the brain and some are not but they are functionally similar. Furthermore, some pointers in memory are just other pointers. Instead of program instructions, a mnemonic is a just a pointer that exists as part of the extended mind. When I hear the alarm from a timer that I have set, it acts as a kind of private speech to trigger a memory, and so the sound then acts as pointer to another address where the memory is stored and triggers the memory and so the alarm is just an external extension of memory, similar to Otto's notebook of directions. Using the rule of parity, it is irrelevant where a memory comes from or how interpretation works, what matters is the is that fact that we cannot tell, looking form the outside, that there is any meaningful functional difference between the two (Levy 2020). If the result is the same, if the consequences are the same, then according to parity it does not matter how the result is achieved.

To this argument, I will state that mnemonics may indeed be a kind of private speech and that they are pointers to memories, but this concession is only true from a strict functionalist point of view. Functionalism is only concerned with the results of the process and not the process itself. Just because processes may look the same externally in that they produce the same result, that these two processes are the same. Only the end result matters. It is here that I diverge from the functionalists, since it is essential to remember that while Inga and Otto may be fictional, that they are standing in for humans, not objects. Yes, Inga and Otto may both travel to the museum successfully, and from that measure the two are equivalent, but if this is true then human beings are merely organic machines without self will. To reduce this example to absurdity, however, what would we say if Inga took 30 min to get to the museum because she took the fast route and Otto got lost and took forty-five days. My point is that there is so much more to a trip to the museum than merely wanting to go and then arriving successfully. Even if one took 3 min and the other took thirty years, a strict functionalist should agree that they were equivalent in the task "going to the museum."

Furthermore, the two trips are equal if and only if people are indeed machines without any agency. Another way to look at the question is to state that we know that Inga and Otto want to go to the museum, but maybe we need to ask why they want to go. What does the trip to the museum mean? Of course, functionalists are not interested in this answer, but maybe Inga is going to the museum to meet an artist friend, maybe Otto is meeting an estranged daughter, maybe Sven, a third person, is going to the museum to murder a spy. While objectively the trips may appear to be equivalent, subjectively they are completely different things. Maybe Inga got mugged on the way. Maybe Otto met a friend. My argument is that there is more, much more, to human cognition than mere function. I will even concede that objectively, functionalism may work as a descriptor, but the issue here is that humans are

subjective beings, not objective ones. Give this subjectivity, somehow as humans the meaning behind a trip can be as important as the trip itself. This is to say that functionalist do not put a lot of importance behind the reasons we say that we do things and are more interested that the thing is done. In fact, functionalism specifically removes mental states from the subjective realm (Levin 2021). It does not matter why a person or a machine does something or even how they feel about it, only that, robot like, they carry out the task and either complete it or not. Functionalism removes the subjective from the human subject.

This objective stance itself may be useful when dealing with machines that emulate the human but becomes problematic when dealing with actual human beings since, using Clark and Chalmers' parity principle, it means that while we can treat machines as if they are human, we can also start treating human beings as if they are merely machines, and therefore without agency. Furthermore, while I understand that some commit to this stance, that humans are just organic ingesting meat tubes with an organic computer for a brain, such a stance ignores that each tube, each human, has its own agency.[9] It is for this reason, that I will concede equivalence, not parity. I will even concede that we may well be meat machines, however, I do insist we have do have agency, at least subjectively. Functionalism is about human as object, as a thing, not about the person subjectively.

4 Coupling as a function of ethics

More than just objecting to the functionalist stance from the point of view of subjectivity and ethics, there is also an issue with the way that proponents of ExCT understand memory and memory states. As above:

1. Peirce notes that signs and their objects are equivalent, not equal.
2. Similarly external mnemonics are not part of the cognitive process, in that they themselves merely point to the process.
3. Mnemonics are not pointers in the computational sense, but they do act like pointers or are like pointers.

Again, a functionalist would ask what the difference is since functionally this difference does not matter to them. The answer to this question is to granularize the

9 I also understand that there are debates about agency and free will and whether these even exist, but for the sake of brevity I am presuming that free will and agency exist and that we are then culpable for bad or non ethical acts and laudable for good and ethical ones. I also acknowledge that "good" and "evil" are religious terms, not philosophical ones (West 2019a) and that we might want to use terms like ethical or unethical as they make such actions relative to the culture in which they occur.

process. When we wish to recall something for which we have created a mnemonic, we think to ourselves, from the example above, "What are the notes of the treble clef?" We then recall that the letters correspond with something. We retrieve the memory "face." We then answer F, A, C, E. All these cognitive events happen internally and there is no need to account for these events in terms of ExCT. While the externalist may then point to the mnemonic of *tzitzit* a kind of extended memory, that externalism may account among other theories, for *tzitzit* but that we do not need to commit to externalism to account for these mnemonics. Moreover, there are differences in our account for *tzitzit* which preclude them from extension: Specifically, in the case of *tzitzit* we are not ourselves trying to trigger a memory, but instead that simply seeing the *tzitzit* themselves should be enough to spontaneously trigger a memory, and also that the *tzitzit* do not have agency since wearing them and remembering has been commanded elsewhere. Merely seeing the *tzitzit* should create a spontaneous recollection and while spontaneous triggering is important for ExCT because they can then claim that the *tzitzit* are agents and that this is extended memory though, in this case the agent is the purported G-d who commands the wearing of *tzitzit* in order to remember His commandments.[10] It does not matter if the deity does or does not exist; what matters is the belief that this Deity has agency and it therefore a part of this puzzle.

To become even more granular, we may go back to the metaphor of computer memory. If we break down a way that we program a computer to remember things and then to act on them, specifically when waiting for an input, we could say that instead of the computer becoming part of our cognition, that due to parity, we may also become part of the computer's cognition and it the agent waiting on us to input some data into its sensorium. Similarly, the frying pan may well be waiting for us to cook with it. The problem with this stance is that in saying that the computer or frying pan is waiting and that it is cognizing, we are allowing it agency, something which at least for the moment is also not true. I could argue here that we are even part of the extended memory of the *tzitzit* since they appear to have the agency when they trigger the memory. The argument works in this way:

1. That per Clark and Chalmers, the environment cognizes and is just as active as the individual who is cognising.
2. That the individual who is cognising is not actively looking[11] for *tzitzit* but just sees them passively.
3. Then when the person who is "cognising" sees the *tzitzit* that the *tzitzit* have agency since they cause the cognisor to remember G-d's commandments

10 Here, I am not making a claim for or against the existence of any such deities, rather I am claiming that those who do believe in such a deity would see that Being as agential.

11 N.B That there is a difference between looking and seeing.

It could then be argued that it is the *tzitzit* which have agency since they trigger the memory, and we can also attribute similar agency to computers that are waiting for input and so on. As such the entire world is agential and we as humans may well not be. As a further example, an automatic teller machine (ATM) is not passive since it displays advertisements and tries to sell users on new products and waits on input from others. From the point of view of proponents of ExCT, it seems that ATMs might have agency, since it might even be argued that they make us input data into them and that they are an active part of a network of agential machines and components.[12]

Clark and Chalmers attempt to get around this problem with the idea that two entities somehow become unified for a time as a single unit. Their term for this idea is the term "coupling[13]". Coupling is a phenomenon, where "In these cases, the human organism is 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." (Clark and Chalmers 1998) I think that it is important to note that, in this case, Clark and Chalmers have become metaphysicians and phenomenologists, that they are proposing a linkage that may only be inferred in a metaphysical manner. The coupling link only exists if we say it does, so that we must commit phenomenologically to this linkage and if we do not it disappears. Only if and when we make this phenomenological commitment then it becomes, as Clark and Chalmers say, active on both sides of that linkage. Also, Clark and Chalmers do not commit to agency where they do not commit to which part of the couple is agential and which is passive. While I can agree that there are networks with some members of that network are actants, and I may agree that even that a kind of imaginary phenomenological linkage may be created, I see no need to commit further than this and I do not need to agree that the members of these networks are any more that actants in a temporary network, not a system.

One of the most common basic examples usually given of this kind of "coupling" linkage is Maurice Merleau-Ponty's example of the visually impaired person with a cane, who becomes so skilled with the cane and so used to using it, that the cane becomes so integrated into the user's cognitive system (Merleau-Ponty 2012). The argument goes that, through usage, the cane almost disappears and becomes like an appendage, to become "transparent" to its user (Wheeler 2019, 859). A much simpler example, and one that is literally transparent, is my eyeglasses. When I wear my eyeglasses, they are transparent to me, in both senses of the term. I do know, however, where I end, and my glasses begin and while my glasses are quite literally transparent, when I am wearing them and we are a coupled system, and while I may

12 During the 1980's a Canadian bank called Canada Trust had ATMs which were called "Johnny Cash Machines" that used the voice of the famous singer, thus trying to imbue the machines with a kind of personality and agency.

13 The term "coupling" would seem to be based on a ribald pun.

even forget that I have them on and go looking for them, I also know they are not a physical appendage, but are a tool that I use so while my glasses may allow me to see better, and while they may disappear, they are not a cognitive system. Wheeler's examples are more active tools, such as a hammer or a cane which require dynamic motion, however I would argue that actively looking, which is different than passively seeing, is just as active as using a hammer. I understand that Wheeler means to get into more complex or bodily embedded systems, so rather than use his example of an embedded device that vibrates when one faces a cardinal direction, let us use the idea of a stent placed in the artery of a heart patient or a lens placed in the eye of a cataract patient, which are embedded technological devices which are made specifically to be transparent. These technologies exist and are transparent and active and literally part of the person. We do not need to infer transparency; it is already there. No need for the metaphysical.

Wheeler also has also chosen cases from Martin Heidegger and Merleau-Ponty to illustrate that way this transparency may occur. In the first case Wheeler cites Heidegger's description of a carpenter's workspace such that the carpenter does not need to think consciously of the placement of the tools, the workbench, or the nails so that as Wheeler says, "It is not only the tool the tool itself but one's interface with it that disappears." Wheeler continues that "Nevertheless, the idea is that, under the right circumstances, equipment becomes transparent." Further to this idea, Mendoza-Collazos and Zlatev have jointly suggested a multitiered approach to agency, whereby agency itself becomes meaning making, so that the usage of a tool may enhance agency or diminish it (Mendoza-Collazos and Zlatev 2022). While this approach is interesting, my issue is slightly different since my point is that nobody asked the tradesperson. Nobody asked the tradesperson or craftsperson if this transparency was indeed truthful. In fact, this idea, kind of like a chef's *mise en place,* is part of all the skilled trades and is not at all in any way remarkable. The point Heidegger is making is that from an objective point of view, outside of the worker, that it appears to him as if the worker and the objects have united, that the human appears to be mechanical. Nobody has asked the worker how they experience the phenomenon, there is no subjectivity or subjective point of view here at all; it just appears to the outsider as if the worker and the environment have in some manner conjoined, based on the skill and experience of the worker. There is no commitment here yet on subjective experience. Heidegger's and Wheeler's description could well be viewed as merely a metaphor and simile rather than a phenomenological state.

More problematic is Wheeler's description of the visually impaired person who appears to use their cane so skillfully so that the cane appears, to the outside observer, to be an appendage that seemingly disappears and becomes part of the user. Wheeler says, "From this perspective, when one says that the blind person no longer consciously apprehends the cane in use, one might well conclude that,

in that respect, the cane is just like the biological machinery that constitutes one of her (properly functioning) organic sense organs." (Wheeler 2019, 859) The problem here is that nobody asked the blind person what their subjective experience is with the way in which they used their cane. Wheeler tells us that the person's experience is such that "Put another way, the blind person's experiential interface is with the world beyond the cane, not with the cane itself," but how does Wheeler know this for a fact? This statement is problematic since nobody asked Merleau-Ponty's blind person if that was indeed her experience. This description of someone else's subjective experience may even be incorrect however until we ask the person, imposition of what we believe to their experience is ethically suspect. So, while I do understand what Wheeler is trying to say, he, Merleau-Ponty and Heidegger are all describing an objective impression of a subjective experience, without any confirmation from the subject. This is a problem in ethics, since they are removing agency from the subject involved and are imposing their own beliefs on the subject's actions. The claim that the workbench or the cane are active agents is debatable whereas the claim that they are merely actants is obvious.

We may then, if we wish to, extend this argument to *tzitzit* which further illustrates the ethics of the problem. The vision of *tzitzit* is supposed to trigger a specific memory and the way that they trigger a specific memory in a brain would be, according to ExCT, another coupled system, since the *tzitzit*, the person who sees the *tzitzit* and who remembers, and the memory itself all become a single whole. We could then call this kind of coupling, selective coupling since only those who know what the *tzitzit* stand for may be, not will be but may be, affected in this manner. Only those who have forged the cognitive link know that when they see their own *tzitzit* or they see someone else is wearing them, that this memory is triggered, along with all sorts of other knowledge, having to do with religious and cultural norms. I could also claim that when it comes to the specific memory, that the *tzitzit* are ethically active in this system and that they themselves trigger the specific memory. Again, the truth is that the *tzitzit* are only actants in this network, since only members of that culture have forged the cognitive link between the sight and the memory willingly and by them. They wanted to remember so they forged the link; the ethical actor is the person who forges the link, not the mnemonic. The system delimits itself to actors and to actants, where I am active, and the other parts of the system are passively actants. The *tzitzit* do not make me remember so much as I have forged that mnemonic link. My glasses may be "coupled" with my ability to see, but they are not active in any sense, except phenomenologically.

Furthermore, if we extend the argument of Merleau-Ponty's visually impaired person and their cane to me wearing my spectacles, the lenses of my spectacles are transparent, as we could say the cane to the visually impaired person and we can

even argue that they both have similar functions. The issue here is this: I would never claim to have perfect vision, I have corrected vision. I am active and my glasses are an actant, as are the things at which I look. I can even add *tzitzit* to this system, where seeing the *tzitzit* through glasses still does not affect the system. While a cane may help a visually impaired and my glasses may help me, my glasses are mine not me, just as the cane belongs to the visually impaired person. There is no reason to resort to an inferred metaphysical connection to account for the system.

Furthermore, these coupled systems can get quite complex and confusing. One example of a coupled network might include the system that starts with me, continues with my ATM card, my ATM machine, the network cables and fibres, the banking network, my bank itself as a corporation, the clerks who process the transactions, the managers and employees of the bank, the bank's shareholders, the stock exchange the country's economy, *ad infinitum*. I could also include the money that is dispensed the bills that I need to pay, the various corporations and subsidiaries to which they are linked, their shareholders, and so on. Coupling, and decoupling is not as cut and dried as may be implied by proponents of ExCT and is far more complex and confusing. Also, if one system is coupled, it may in turn may become coupled with other systems, which in turn may become coupled with even more systems, with the implication that the "I" in the system is just part of a massively coupled, coupled, coupled, coupled system, that does not end. Everything is then potentially always coupled or decoupled with everything else. To take this problem to its logical extreme, the ethical, Cartesian "I" that couples or decouples, may not even exist in such a system; it may be as the Buddhists say that "I" am the thing that exists and "I" am the observer of my own being; it is this system and action of being and observing that creates the illusion of "self" (Oh 2021). From this point of view, we might state that perhaps the Cartesian self, the "I," is an entity that is coupled with an observing self and therefore creates the illusion, or a phenomenon that we call existence, as a coupled system between self and body. We could conjecture that perhaps this illusive self is only real because we observe it.[14] It is better, then, for us to understand that some parts of network are agents, and some are merely actants. My issue here is not with coupling as a simile or as a descriptor, as I have no issue with ExCT as a descriptor. I do contend, that ExCT is a reasonable simile, not a metaphor that things are *like* they are coupled. It is as if they are coupled or like they are coupled.

14 Further discussion of the self as illusion and the difference between Western and Eastern philosophical systems is unfortunately beyond the scope of this paper.

5 Parity as metaphor for disfunction

We may then wish to argue that Otto's notebook is coupled and then functions as equivalent to embrained memory and so that under the rules of parity the two may be regarded as equivalent. We may object to this statement by understanding the way that other kinds of memory work. Computers store some kinds of memory, which is just data, on disk and some other kinds in RAM. We even store data on disks, CD-ROMs, and USB drives, where the ROM part of CD-ROM stands for "Read Only Memory." We can therefore compare Otto's notebook and the data it holds to removeable memory that is stored on a thumb drive and we can compare Inga's memory of how to go to the museum to memory that is stored on a hard drive. We need to remember that the reason we need to go through this process at all is because Otto's "hard drive" is dysfunctional; it is broken, so he requires the USB or notebook memory as a workaround, just as it is possible to boot a computer system or to run programs from a USB drive. In Otto case, we need to stress that we are not describing an optimally functional system where in fact, in Otto's case the system is absolutely broken. Fortunately, for Otto's sake, we have managed to find a work around, so that while the systems may be functionally equivalent, we can state that one of the systems is intrinsically broken or dysfunctional. It is for this reason that we state that the two systems are equivalent and not equal. The two systems are not working at the same repair level, and while in equity we should allow parity, what we call parity is by no means equality. As another example, let us say that we have two cars: the first car has an issue where the engine floods with gas every two kilometres and must then stop for a ten-minute rest, and the second car just runs as we would expect. Functionally, the two cars are the same and according to parity they both do what we want. A true functionalist would have no reason to choose one car over the other since both cars will get the functionalist where they need to go equivalently. In Clark and Chalmers case, I am not dismissing the fact that Otto does make it to the museum, but so does the car that breaks down yet functionalists want to commit to a system that is not in good repair.

6 Conclusions

Mnemonics are a kind of memory which may be accounted for as extended memory or intercranial memory. Since it is a sort of hybrid, the best way to account for it is in terms of scaffolding and not necessarily extending cognition. This is not to say that extension is not important and that it may account for other ideas but the in terms of mnemonics, the idea of extension is just not required. Mnemonics may well be a form

of distributed cognition, but again, scaffolding is a sufficient to account for it and also does not require any metaphysical commitments. That being said, scaffolding and the kind of distribution which I describe in this paper, are important and become more important as technology becomes more interlinked and complex.

Otto and Inga may arrive at the same place, however, unlike the functionalists, I believe that it does matter how they got there and why they went, that some methodologies or algorithms may be better than others, not just more optimal. I also believe that there is a reason that we choose certain methods above others. Instead of asking ourselves if Otto's notebook works like memory, we might ask if he likes having the notebook, or, if he had a choice, which one would he choose, memory in his brain or in his notebook? Otto, in thought experiment is not a machine or an object, he is a human being. The subjects of these thought experiments are treated as objects.

That is really the point of this paper, that the Otto and the Inga of the thought experiment are not subjective human beings, they are objects to be manipulated. They are both exemplars in a thought experiment, and an experiment that reduces the human to a single function without subjectivity. This is the entire problem with functionalism, that it reduces the human and the animal to organic machine, one without feelings, without wants desires, one without agency and a kind of machine where these feelings, wants, and desires are completely inconsequential. This inconsequentiality is a point I refuse to concede. If we are merely machines, then many of the social problems we have may be then fixed logically, but not necessarily humanely.

And of course, this entire paper illustrates one of the issues with logic. Logic is useful as a tool; it is not the only tool. It is possible to state logical truths that are empirically impossible and while we hope to make logic do so, often it must be fraught and tortured to account for the natural world around us. Our puppets, Otto and Inga, and the doctrine of functionalism are all useful tools, but we should be careful to recall that humans are not logical nor are we logic bound, we are not rational but rationalizing. Treating humans as any sort of object is what led us to the various genocides of the past centuries, to eugenics, and all of these were also logically justified by their proponents. Beauty and ugliness are not logical, yet they exist. Instead of worry how to get to the museum, perhaps we need to consider what it is that makes going to the museum worthwhile.

Acknowledgements: The author acknowledges the funding of this research by SSHRC, the Social Sciences and Humanities Research Council of Canada. The author is not aware of any conflicts of interest in this research.

References

Adams, Fred & Kenneth Aizawa. 2009. Why the mind is still in the head. In Murat Aydede & Phillip Robbins (eds.), *The Cambridge handbook of situated cognition*, 78–59. Cambridge: Cambridege University Press.

American Psychological Association. 2022. *APA dictionary of psychology*. APA. https://dictionary.apa.org/mnemonic (accessed 23 November 2022).

Atkin, Albert. 2010. Icon, index and symbol. In Patrick Colm Hogan (ed.), *Cambridge Encyclopedia of the language sciences*, 367–368. Cambridge: Cambridge University Press.

Carter, J. Adam & S. Orestis Palermos. 2016. Is having your computer compromised a personal assault? The ethics of extended cognition. *Journal of the American Philosophical Association*. https://doi.org/10.1017/apa.2016.28.

Clark, Andy & David Chalmers. 1998. The extended mind. *Analysis* 58(1). 7–19.

Descartes, René. 1988. *Discourse on the method of rightly conducting one's reason and of seeking the truth in the sciences*. Translated by Donald A. Cress. Indianapolis & Cambridge: Hackett Publishing Company.

Giere, Ronald N. 2004. The problem of agency in sceintific distributed cognitive systems. *The Jornal of Cognition and Culture* 4(3–4). 759–774.

Latour, Bruno. 1999. Give me a laboratory and I will raise the world. In Mario Biagioli (ed.), *Science studies reader*, 258–275. New York & London: Routledge.

Latour, Bruno. 1996. On actor-network theory: A few clarifications. *Soziale Welt* 4(1996). 369–381.

Levin, Janet. In Edward N. Zalta (ed.), *Functionalism*, December 21, 2021. https://plato.stanford.edu/archives/win2021/entries/functionalism/ (accessed 30 August 2022).

Levy, Neil. 2020. Cognitive enhancement: Defending the parity principle. In Nicole A. Vincent, Thomas Nadelhoffer & Allan McCoy (eds.), *Neurointerventions and the law: Regulating human mental capacity*, 33–74. Oxford & Boston: Oxford Academic Press.

Mendoza-Collazos, Juan Carlos. 2021. Responsibility of action and situated cognition in artefact—user relationship. In Nancy L. Black, W. Patrick Neumann & Ian Noy (eds.), *Proceedings of the 21st congress of the international ergonomics association (IEA 2021)*, 211–216. Cham: Springer International Publishing.

Mendoza-Collazos, Juan Carlos & Jordan Zlatev. 2022. A cognitive-semiotic approach to agency: Assessing ideas from cognitive science and neuroscience. *Biosemiotics* 15. 141–170. https://doi.org/10.1007/s12304-022-09473-z.

Merleau-Ponty, Maurice. 2012. *The phenomenology of perception*. Translated by Donald Landes. London: Routledge.

Miller, Walter M. 1959. *A Canticle for Leibowitz*. New York: J. B. Lippincott and Company.

Morrison, Alexandra B. & Lauren L. Richmond. 2020. Offloading items from memory: Individual differences in cognitive offloading in a short-term memory task. *Cognitive Research*. https://doi.org/10.1186/s41235-019-0201-4.

Oh, Wachul. 2021. Understanding of self: Buddhism and psychoanalysis. *Journal of Religion and Health*. https://doi.org/10.1007/s10943-021-01437-w.

Peirce, Charles Sanders. 1982. In The Peirce Edition Project (ed.), *The writings of Charles S. Peirce: A chronological edition*, vol. 2. 8 vols. Bloomington: University of Indiana Press.

Sandburg, Carl. 1916. Fog. In *Chicago poems*. Chicago & Illinois: Henry Holt.

Sterelny, Kim. 2010. Minds: Extended or scaffolded. *Phenomenology and the Cognitive Sciences* 9. 465–481. https://doi.org/10.1007/s11097-010-9174-y.

West, Joel. 2019a. Models as signs of the imaginary: Peirce, Pierce, Langer and the non-discursive sign. *Semiotica*. 2022(245). 63–78.
West, Joel. 2019b. The joker on the couch: A case study. *The International Journal of Semiotics and Visual Rhetoric*. 3(1). 11.
West, Joel. 2022. *The fractured Jew: An exploration of modern Jewish ontology via identities in popular culture*. Leyden & Boston: Brill.
Wheeler, Michael. 2019. The reappearing tool: Transparency, smart technology, and the extended mind. *AI and Society* 34. 857–866. https://doi.org/10.1007/s00146-018-0824-x.

Bionote

Joel West
Institute for the History and Philosophy of Science and Technology, University of Toronto, Toronto, Canada
joel.west@mail.utoronto.ca

Joel West is a PhD candidate at the Institute for the History and Philosophy of Science and Technology at the University of Toronto. His research involves the problem of meaning from an interdisciplinary point of view and specifically how it is that cognition is semiotic. Prior publications include two monographs, *The Sign of the Joker* and *The Fractured Jew*, also a book chapter on neologisms as Peircean indexes and, papers with topics as diverse as the semiotics of Bernie Madoff's Ponzi scheme and a psycho-semiotic analysis of the Joker.