Remembering and imagining as attitudes: an interpretivist account

Remembering and imagining as attitudes: an interpretivist view

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Abstract

The (dis)continuism problem asks if episodic memory is continuous with imagination. Given its close proximity with the cognitive sciences, philosophers have traditionally taken this issue as part of a larger naturalistic framework in the philosophy of memory. Some philosophers have argued that such naturalistic methodology entails the need for philosophers to also take the mental attitudes of remembering and imagining into account. However, the naturalistic methodology is concerned with making ontological claims on the basis of the relevant explanatory terms inside the framework of the empirical sciences. It is unclear whether attitudes have such a role in the cognitive sciences, specially cognitive neuroscience. Without such an account of their relevancy, one could argue that it is unlikely that "remembering" and "imagining" have any significant role in naturalistic philosophy. Such is the *exclusion argument*. In this paper, I offer an account of how mental attitudes indirectly correspond to neural mechanisms to show how the exclusion argument is not sound. This account, named *interpretivism*, not only supports pluralism about (dis)continuism, but also indicates how empirical and epistemic meanings of "remembering" could be integrated in our thinking about memory.

Keywords: Episodic memory, Imagination, (Dis)continuism, Propositional attitudes, Interpretivism, Real patterns, Naturalism

1 Introduction

One of the main questions of philosophy of memory today is the relation between episodic memory and imagination: specifically, whether episodic remembering and imagining are supported by the same underlying mechanism and, consequently, if they should be viewed as the same cognitive capacity. This problem, named *(dis)continuism*, has resulted in numerous discussions on the particular similarities and differences between remembering the past and imagining the future (Michaelian and Perrin, 2017). Philosophers are particularly drawn to findings in the cognitive sciences, which tend to highlight the overlap between the neurocognitive systems of memory and imagination. In this context, developing a philosophical account that is in line with the empirical sciences is one of the main tenets of methodological naturalism, which has been influential in how we philosophically think about memory (Michaelian, 2016b; Andonovski and Michaelian, 2024).

In light of this methodology, Robins (2020) argues that we should consider the different attitudes involved in episodic memory and imagination. *Mental attitudes* here are characterized in terms of the different stances a subject can have towards a particular mental content (e.g., believing, desiring, and so on). Per Robins, given that attitude terms are frequently used to coordinate participants' behavior in cognitive science experiments, a naturalistic philosopher of memory should take them into account. Robins particularly mentions the use of attitude terms in designing experiments in cognitive neuroscience, where, for example, participants are asked to *remember* a particular scene and to *imagine* if that scene had happened differently. While I agree with her assessment, I worry that her appeal to the use of attitude terms in the sciences of the mind is not sufficient for taking them seriously in a naturalist methodology. In particular, what seems to be missing from Robins' argument is a more general account of how these attitudes are individuated and which explanatory role they play in our theorizing about cognition. Considering that the naturalist dictum stipulates that we should make ontological commitments to the entities relevant for explanations in the empirical sciences, if attitudes do not serve an explanatory role in the cognitive sciences, a naturalistic philosopher of mind should not take them into account — much less if they are describing the relationship between episodic memory and imagination.

The main purpose of this paper is to fill this gap. In the pages that follow, I argue for *interpretivism* about mental attitudes. Interpretivism is the thesis according to which mental attitudes are patterns of thought and behavior that, in virtue of being patterns, depend on a particular perspective to be identifiable. Once that perspective is clearly demarcated and the attitudes in question individuated, they excert a top-down constraint on our investigation for the mechanisms that underlie that pattern. Consequently, mental attitudes become indispensable for the mechanistic investigation of cognitive phenomena. Applied to the (dis)continuism problem, the interpretivist view entails a kind of pluralism, where the relationship between remembering and imagining

becomes highly dependent on the particular stance one takes in individuating these attitudes.

This paper is structured as follows. In section 2, I offer an overview of the background for (dis)continuism and the current state of philosophy of memory. In section 3, I present an argument against the inclusion of attitudes to naturalistic philosophy of memory, as well as the relevant notions of methodological naturalism, mental attitudes, and folk psychology. In section 4, I present the interpretivist view on mental attitudes, and defend it against possible objections. In section 5, I explore how interpretivism leads us to adopt a pluralist view on (dis)continuism, as well as how it provides a novel argument for the relation between epistemic and empirical meanings of remembering. Finally, section 6 is reserved for summary and conclusions.

2 Background

Among the many capacities of the human mind, the ability to re-experience events from the past is one that has puzzled philosophers and scientists for centuries. Ever since the early 1970s, this type of remembering has been dubbed "episodic memory", which consists in the state of entertaining a mental representation about an event in one's personal past and, consequently, mentally time travelling to that past event (Tulving, 1972, 1985). Contemporary philosophy of memory has predominantly focused on several issues regarding this form of memory, particularly its relation with imagining the personal future and counterfactual scenarios (Michaelian and Perrin, 2017; De Brigard, 2013). Functional imaging data from cognitive neuroscience strongly suggest that there is a substantive overlap in the brain regions supportive of remembering the past, imagining the future, and picturing a counterfactual event (Schacter and Addis, 2007; McLelland et al., 2015; De Brigard et al., 2013). Moreover, there is substantive evidence that episodic memory and imagination share a similar phenomenology (D'Argembeau and Linden, 2006), and that they have similar development trajectories in children (Atance and Sommerville, 2014). Motivated in part by these studies, some philosophers defend *continuism*, the view that there are no fundamental differences between episodic memory and imagination (Michaelian, 2016a; De Brigard, 2013). In contrast, other researchers argue for *discontinuism*, which claims that memory and imagination are fundamentally distinct (Perrin, 2016; Bernecker, 2010; Robins, 2022a). This debate on the cognitive ontology of memory and imagination is currently named *(dis)continuism*.

As a side-effect of the (dis)continuism debate, philosophers of memory have recently taken interest in methodological concerns with respect to the relationship between philosophical and empirical investigations on memory. Given its close proximity with the cognitive sciences, it has been standard to view philosophy of memory and (dis)continuism as instances of naturalized philosophy (Michaelian, 2016b; Robins, 2020; Andonovski and Michaelian, 2024; Robins, 2022b). In this scenario, the methodology of naturalism stands for a

type of theoretical constraint: only accept into an ontology the entities present in the relevant scientific explanations — such as cognitive psychology and neuroscience (Robins, 2020; Keeley, 2016; Kornblith, 2002).

From the previous discussion, it seems as if methodological naturalism can only support continuism about memory and imagination. If we are only allowed to make ontological commitments about entities that have empirical support, and if the relevant evidence from cognitive science suggests that there are no major differences between the systems for remembering and imagining, then a naturalistic philosopher would have to commit to the view that there is no major difference between memory and imagination and, hence, that they are fundamentally the same.

Against this view, Robins (2020) argues that a naturalist methodology does not necessarily preclude discontinuism. Her claim is based on the fact that many of the neuroimaging studies cited by continuists (e.g., Schacter and Addis, 2007; De Brigard et al., 2013) use a vocabulary that implies a difference between the attitudes of remembering and imagining. For example, De Brigard et al. (2013) asked participants to first remember a particular past event, and then use the same elements in their memory to create a scenario of how that event could have happened. Their task design thus involved a difference in attitudes between remembering what an event was like, and imagining what that event could have been. Given that participants are able to tell when they are remembering instead of imagining, and that they competently follow researchers' instructions, it is likely that there is a distinction at the personal level between memory and imagination. According to Robins this distinction is due to their different mental attitudes. Given that neuroimaging experiments exploit this differentiation, a naturalist philosopher of memory should take it into account and, therefore, not jump into the conclusion that episodic memory and imagination are fundamentally the same.

I do agree with Robin's general claims that neuroimaging studies alone do not necessarily entail that continuism is true, and that naturalistic philosophy of memory should pay attention to other forms of empirical investigation other than cognitive neuroscience. However, I believe that there are a few potential issues with her argument. Even assuming that mental attitude terms are present in the framework of cognitive science, it is not clear whether they have a relevant explanatory role, or are just tools for coordinating the participants' behavior, or even just filler terms to be replaced in a more substantially developed vocabulary. The main idea here is that not every concept in a scientific framework serves a *relevant* explanatory purpose. Following a standard characterization of the naturalist methodology, we should only make ontological commitments to those entities and characterizations that have relevant explanatory roles in out best scientific theory available. In this regard, given that scientists often postulate entities and create characterizations that are, sometimes knowingly, filler elements to be replaced in the future,[1] not every concept in an empirical framework has the same explanatory weight. Hence,

[1] See Bechtel and Richardson (2010) for more discussion on such cases.

there are some elements in such a framework that need not be accounted for by a naturalist philosopher. Robins' argument takes for granted that mental attitudes are relevant terms in cognitive science, but it is not obvious that it is so. This concern has been voiced before in the philosophy of mind, most famously by Churchland (1989) and Stich (1985), which indicates that a more explicit argument for the relevance of mental attitudes to cognitive science and naturalistic philosophy is in order. This critique forms the basis of the *exclusion argument*, which will be developed in detail in later sections.

Therefore, even if a naturalistic philosopher should take both personal and sub-personal phenomena into account, we still need a conceptual structure that more clearly articulates the explanatory function of mental attitudes to cognitive science, as well as its connection between mental attitudes at the personal level and the search for neurocognitive mechanisms at the sub-personal level. In this paper, I argue for *interpretivism* as a solution for this problem. Based on Dennett's (1991) and Haugeland's (1998) discussion on patterns, and their application to mechanistic philosophy of cognitive science (Kästner and Haueis, 2021; Francken and Slors, 2014), interpretivism consists in the thesis that mental attitudes are ways of talking about real patterns in subjects' general behavior (which includes bodily and mental behavior) and their underlying mechanistic structures. In this scenario, mental attitudes are understood as patterns that, once detected, constrain the range of possible mechanisms for which researchers should investigate. This criterion, called *top-down constraint* (Bechtel and Richardson, 2010), serves as a clear connection point between talk of attitudes at the personal level and the search for mechanisms at the sub-personal level, thus answering the exclusion argument. Such framework is also capable of making clearer how epistemic and empirical meanings of 'remember" are connected: arguing against the incompatibility thesis of McCarroll et al. (2022), interpretivism supports the claim (also made by Craver, 2020) that epistemic and empirical remembering are compatible descriptions under the same perspective.

3 The exclusion argument

The argument for the exclusion of attitudes from naturalistic philosophy of memory can be so formalized:

P1. Methodological naturalism consists in the normative thesis that, for any x, it is necessary that x plays a relevant explanatory role in our best scientific theory for philosophers to make ontological commitments about x;

P2. Mental attitudes, such as "remembering" and "imagining", are expressions from folk psychology used to coordinate intersubjective behavior;

P3. If (P2), then scientists use the terms "remembering" and "imagining" as a way to coordinate participants' behavior and are not explanatory in any relevant sense;

P4. If (P1) and (P3), then a naturalistic philosopher of memory need not make ontological commitments based on mental attitudes;

C. Therefore, naturalistic philosophy of memory should not be concerned about the attitudes of "remembering" and "imagining".

There is a lot to unpack in this argument. In the subsections that follow, I analyze each proposition to show how they support the exclusion of attitude-talk from naturalistic philosophy of memory. After that, I present the interpretivist account as a way of arguing against (C).

3.1 P1. Methodological naturalism

The overarching naturalistic claim with respect to methodology is that philosophy should be in continuity with the empirical sciences. Following one characterization (Kornblith, 2002, 2017; Emery, 2023), naturalism is vindicated by a particular metaphilosophical thesis: philosophy's object of study are the phenomena in themselves, not the concepts we use to refer to these phenomena. In this sense, epistemology is not concerned with the concept of "knowledge", but with knowledge itself — i.e., how individuals come to acquire it, and which are the common characteristics across tokens of knowledge. Similarly, the metaphysics of time tries to understand time itself, and not the concepts we use to refer to time.

While the naturalistic thesis about the object of philosophical study may not be entirely accepted by some philosophers (e.g. Thomasson, 2017), it does lead to some interesting results and fruitful venues of research. In particular, taking philosophy as concerned with phenomena in themselves leads us to endorse that the philosophical enterprise is, ultimately, an empirical matter and should be conducted in close proximity with the empirical sciences. As such, metaphysicians working on time should work with physicists to discover what the nature of time is; epistemologists should collaborate with psychologists to understand the cognitive processes behind knowledge, and so on. As Quine (2004) puts it, philosophy is a highly abstract branch of empirical science.

So far, what we have is a general account of how philosophy should be conducted in relation to the sciences. But pointing to the relation does not make it explicit how it should be conducted. What kind of evidence should we take into consideration? What is the role of folk concepts and intuitions in naturalistic philosophy?

In the first chapter of *Knowledge and its place in nature*, Kornblith (2002) discusses these issues directly. In particular, he notes that whenever we are investigating a given phenomenon, our research progresses as we gather more empirical data and are able to come up with theories that accommodate and explain what we observed. While our end goal is to create a theory that is adequately informed by empirical data, to get there we need some way to refer and talk about the phenomenon we are studying, even if such way of speaking is generally imprecise and can be revised as more research is done. As such, folk concepts and intuitions play a very important role at the beginning of a

research project, mostly as tools to fix *explananda*, on the basis of which initial hypotheses can be created. As research progresses, and more experiments are made, our initial and ordinary understanding may be revised in light of what was found. This is what Bechtel and Richardson (2010) call "reconstituting the [*explanandum*] phenomenon".

As such, while philosophy may start with a folk conception of the phenomenon, its end goal is to create a theory that is informed by and continuous with the empirical sciences (following P1 from *the exclusion argument*). Such theory will make ontological commitments based on our best scientific theory available and may be entirely different from our common sense understanding of the phenomenon. This is because, in a naturalistic methodology, accordance with folk concepts and intuitions is not a parameter with which we should decide which theories to endorse. If the preceding account is correct, then naturalistic philosophy of memory may not take common sense conceptions of memory and imagination as relevant parameters. Do such conceptions include mental attitudes? This is the topic of the next section.

3.2 P2. Folk psychology and mental attitudes

Folk psychology is ubiquitous in everyday life. If, say, Alina desires to have ice cream and believes that there is some leftover in the fridge, we are thereby allowed to infer that her going to the kitchen had the intention of getting ice cream. We make such inferences and predictions fairly often and, most of the time, we are successful in doing so. We connect overt behavior with certain mental states ("believing that there is ice cream in the fridge") in such a way that the latter is predictive of the former. Folk psychology, then, is the practice of giving explanations of other people's behavior by reference to their internal states (Fodor, 1987).

The mental states cited by folk psychology are composed of two parts: a content and an attitude. In the traditional representational theory of mind, a mental content is a proposition, usually preceded by a that-clause, towards which a subject bears some relation (such as believing, desiring, remembering, and so on). These relations are called "mental attitudes".[2] Discussion on mental attitudes spans various domains across philosophy, ranging from the philosophy of mind, epistemology, philosophy of language, among others (Schroeder, 2006). Although there is some discussion on what is the nature of mental attitudes, philosophers typically agree that mental attitudes, among with other postulates of our folk psychology, are reliable for understanding and predicting behavior in ordinary contexts.

Here it is important to disambiguate different uses of the term "mental attitudes" in folk and technical contexts.[3] While folk ascriptions of mental

[2] In the philosophical literature, it is more traditional to use the term "propositional attitudes". I chose to substitute the term "propositional" for "mental" since the latter better encompasses the view that mental content can have representational formats other than propositional. This is important because, given the the fact that episodic memory often has imagistic content (see, e.g., Teroni, 2018; Robins, 2020), it is better to choose a term that reflects the multiple forms of content that memory can have.

[3] I thank an anonymous reviewer for bringing this point to my attention.

states may not explicitly conceive of these states as mental attitudes, they nevertheless carry important characteristics which are picked out by technical uses of the term. For example, folk psychology marks a clear distinction between *believing* and *desiring*: this much is evident from the intuitive difference there is between "Alina believes that p" and "Alina desires that p". But the intuitive and folk distinction between these sentences is explicated by the technical conception of beliefs and desires having different directions of fit (Anscombe, 1963). As such, folk psychology may not explicitly use the term "mental attitudes", but it employs the concept in accordance with the technical understanding of these attitudes.

In this context, "remembering" and "imagining" are to be understood as mental attitudes from the ordinary way we understand and predict the behavior of other people — as stated in P2 from the *exclusion argument* (section 3). For instance, if Alina says to Alice "I remember receiving a red bicycle on my 8th birthday", Alice can reasonably infer that Alina believes that she received a bicycle on her 8th birthday, and that she has that information from her personal past. While the relation between episodic memories and beliefs is not without its controversies, this case illustrates how, in ordinary contexts, one can infer someone else's beliefs and the source of those beliefs from what they claim about their memories. This is all the more clearer when we consider that Alice may not be as inclined to make the same inferences if Alina were to say "I *imagine* receiving a red bicycle for my 8th birthday". Yet, these differences in folk psychology alone may not be sufficient for a proper scientific theory of memory and imagination. Whether this is the case is the topic of the next section.

3.3 P3 & P4. Folk terms in scientific psychology

While the previous subsection may not have been enough to cover the vast range of discussions regarding mental attitudes, it explored a very important point for the purposes of this paper: that attitudes and other folk mental posits are primarily useful for daily communication and coordination of behavior. If this is so, a pressing question then arises as to what is the relation between folk psychology and more scientific ways of understanding the mind. In the same way that the folk understanding of tomatoes as vegetables, not fruits, is not particularly useful for botany, the folk conception of remembering and imagining may fall short of being incorporated into a complete and robust account of cognition. If there isn't a comprehensive framework that articulates the proper explanatory role of attitude terms to cognitive science, such terms will have to be eliminated from the former.

P3 in the *exclusion argument* highlights one straightforward way of mental attitudes being included in cognitive science experiments: researchers use them to direct participants' behavior in remembering and imagining. This brings us back to Robins' (2020) defense of mental attitudes in naturalistic philosophy of memory. She argues that the mental attitudes of "remembering" and "imagining" have to be taken seriously in a naturalistic philosophy of

memory given that these terms are used in the cognitive sciences' research program. Particularly in neuroimaging experiments, Robins notes that scientists instruct participants' behavior using attitude terms, thus implying that they are incorporated into that particular research program. Further, this incorporation consists in the use of attitude terms in experimental design — i.e., the studies rely on the ability of participants to distinguish between remembering and imagining states (Robins, 2020, p. 15).

However, the use of a concept in experimental design does not guarantee that it will be present in the final theory. As the examples in Bechtel and Richardson (2010) illustrate, a particular concept or understanding of a phenomenon, characteristic of initial stages of research when experiments are designed, are likely to be radically changed once a full account is developed. Thus, in the present framework, there is no guarantee that folk terms will be relevantly incorporated into an elaborate theory of cognition. This lack of any robust explanatory role for mental attitudes connects P3 and P4 in the exclusion argument. The latter premise stems from considering that the use of attitude terms in the experiments discussed is not explanatorily relevant for the purposes of cognitive science and, hence, should not be incorporated in naturalistic philosophy.

As such, it is not clear whether the cases cited by Robins (2020) exemplify a genuine importance of attitudes to naturalistic philosophy of memory. Attitude terms, such as "remembering" and "imagining", would only be relevant for naturalistic (dis)continuism if their use is actually relevant for explanation in the cognitive sciences, and not just as tools to coordinate the behavior of research participants. Without a more detailed account of how attitude terms can be fruitfully incorporated into the program of cognitive science, they run the risk of being eliminated from the latter. Developing such account is the goal of the next section.

4 An interpretivist account against the exclusion argument

In this section, I show that the exclusion argument can be blocked in two different but related ways. The first of which, here named *the compatibility argument* consists in arguing that the consequent of P3 does not follow from the antecedent — i.e., just because mental attitudes are terms used primarily in ordinary contexts, it does not necessarily follow that they don't have any significant explanatory role in the sciences of the mind. While denying P3 is sufficient to conclude that C is false, it is not sufficient to claim that the contrary of C is true, i.e., that naturalistic philosophy of memory should take mental attitudes into account. To argue for such inclusion, I present the *interpretivist argument*. Given that both arguments deal with mental attitudes at a high level of generality, the conclusions drawn from them can only be tentative. Nevertheless, they provide the necessary groundwork for defending important points in the philosophy of memory, as presented in section 5.

4.1 The compatibility argument

The compatibility argument is an attempt to block (C) by denying (P3) — i.e., it argues that there is no incompatibility between folk psychology and cognitive science in general. In the philosophical literature on mental attitudes, there are two general ways for defending such compatibility. The first way is *intentional realism*, according to which the attitudes posited by folk psychology can be identified with real processes in the mind/brain. As such, there would be no incompatibility between folk psychology and the cognitive sciences. The second way is the *intentional stance theory*, according to which folk psychology is just a way of describing certain patterns in thought and behavior. As such, folk psychology is not a theory in any strict sense and it makes no claims about the mechanisms that underlie these patterns. Such account allows it and mental attitudes to be, in principle, compatible with the cognitive sciences. I analyze each of these theories in turn.

4.1.1 Intentional realism

It is tempting to think that the predictive success of folk psychology entails that the entities and processes postulated by it have a strict relation with cognitive processes implemented in the brain. This position, here called *intentional realism*, is famously championed by Fodor (1987). He argues that the best explanation for why folk psychology and attitude-ascriptions are so successful is that they refer to discrete and real cognitive processes. While the inner workings of such processes still have to be uncovered by scientific psychology, Fodor maintains that our folk understanding already points us to the correct direction. In particular, Fodor (1981) argues how sentences that express attitude-ascriptions (e.g., "Alina believes that she received a red bicycle on her 8th birthday") have a structure that indicates a relation (e.g., "believes that") between a subject (Alina) and a mental representation ("she received a red bicycle on her 8th birthday"). Based on such linguistic analysis, Fodor highlights how we can infer "Alina believes something" and "there is something that Alina believes", thereby supporting his ontological commitment to mental attitudes and mental representations (see De Brigard, 2015, for more discussion).

Supposing that Fodor is correct with regards to the existence of mental attitudes, it entails that *the exclusion argument* is not sound. The claim that the attitudes of "remembering" and "imagining" directly refer to states in our mental economy is sufficient for a naturalistic philosopher to taken them seriously. Moreover, if intentional realism were true, it would be senseless for cognitive scientists to dismiss attitude talk as mere common sense, thus also denying that folk psychology can be safely eliminated in a scientific context.

However, there are reasons to remain skeptical of Fodor's arguments for intentional realism. Firstly, his linguistic analysis of mental attitude expressions does not apply for all mental states that, supposedly, employ attitudes like beliefs and desires (Ben-Yami, 1997). Secondly, given the wide range of

attitudes we attribute to ourselves and other people, intentional realism would have to be committed to the existence of an extremely large collection of neurocognitive systems. It is unclear whether admitting the existence of such a large variety of attitudes would yield significant explanatory benefits. In fact, if there is a less permissive and equally, or even more, viable alternative to intentional realism, Occam's razor would certainly prefer the former.

Thirdly, intentional realism is in contrast with most recent developments in the cognitive sciences. As was first highlighted by Price and Friston (2005), most of our psychological terms do not have a strict relation with neural structure. This finding lead to the current discussion on creating a new taxonomy of psychological processes, commonly know as "cognitive ontology", that is better informed by what we currently know about the brain (Poldrack, 2006; Anderson, 2015; Dewhurst, 2021). While the jury is still out on how we can accomplish this goal, it is sufficient for present purposes to note how, if even *scientific* psychological concepts do not map very well with the brain, then *folk* psychological terms would not fare any better. In fact, it is perfectly plausible that the postulates of folk psychology are incompatible in light of cognitive neuroscience (for an argument to this effect, see Churchland, 1981, 1989). In short, if we grant that folk psychology and mental attitudes are supposed to refer to actual processes in the mind/brain, we assume the likely risk of having to replace these concepts in light of their incompatibility with findings in neuroscience.

4.1.2 Intentional stance theory

Standing in between Fodor's (1987; 1992) intentional realism and Churchland's (1989; 1981) eliminative materialism, Dennett (1988; 2009) argues that mental attitudes do not directly refer to discrete processes in the mind-brain. His argument to that effect is that attitudes, along with other folk psychological postulations, are particular ways of speaking about a system that instantiates a certain pattern of behavior. No strong ontological commitments about underlying mechanisms are necessary to interpret people as if they believe, desire, or remember — instead, what is necessary is to view them from the intentional stance.

In Dennett's theory, the intentional stance is a way of describing and predicting the behavior of a given system based on the assumption that it is a rational agent. For example, suppose I installed a digital security system in my house. The system is composed of a camera next to my front door, who is connected to a computer which processes the data that come from the camera. If the computer detects someone in front of my house at night, it will trigger an alarm. One night, I wake up to the alarm and check the computer to see who is outside. Much to my surprise, only the neighbor's dog is outside, not so gently asking to come in.

From the intentional stance, my home's security system is described as *seeing* some suspicious movement and, thereby, forming the *belief* that there was a person knocking on the front door, which *motivates* the system to trigger

an alarm *in order to* let me know that there is someone outside. The highlighted terms indicate conceptions from folk psychology, which enable us to make useful approximations of the security system as a rational agent. Such approximations are what make the intentional stance an effective framework for explaining behavior, since they abstract away the physical and design particularities of a given system. Following Dennett, the fact that a system works *as if* it were an intentional system is sufficient for it to *be* an intentional system.

Despite the apparent reasonableness of Dennett's theory, it still does not give us an answer for *why* the intentional stance is so effective. While the previous discussion indicates that the intentional stance might be a particularly useful form of speaking, it doesn't exclude the possibility that these explanations are just lucky, or that they only reflect a human tendency to draw inferences about internal states when, in fact, there aren't any. Indeed, Dennett addresses this difficulty in *Real Patterns* (1991), where he argues that intentional descriptions refer to general patterns of behavior. While different instances of such patterns may differ in detail, what matters for the intentional stance is the fact that the pattern is repeatable and, therefore, we are capable of making reliable predictions based on it. As such, while mental attitudes do not directly refer to discrete processes in the mind/brain, they indicate a certain regularity of behavior that can only be detected when abstracting away from specific details.

This account is sufficient to argue for compatibility between, and the relevant epistemic role of, mental attitudes to the cognitive sciences, consequently denying P3 in the exclusion argument (section 3). Given that mental attitudes refer to patterns of behavior, which are more coarse-grained descriptions in comparison to cognitive explanations, there may not be any incompatibility between folk and scientific explanations of the mind. In this framework, they are just different ways of referring to the same phenomena at different levels of abstraction.

However, to say that there are compatible *in principle* does not entail that they are *actually* so, nor that there are any significant explanatory advantages in describing cognitive states with mental attitudes. In particular, the claim that attitude terms such as "remembering" and "imagining" refer to general patterns of behavior does not, by itself, indicate any particular relevance of mental attitudes to the cognitive science of memory and imagination. In the next subsection, I argue that mental attitudes, understood as terms that refer to patterns of behavior, are important for our scientific understanding of the mind: they serve as *top-down constraints* on our search for neurocognitive mechanisms (cf. Bechtel and Richardson, 2010).

4.2 The interpretivist argument

Before exposing the interpretivist account, I should first analyze how cognitive science explains mental phenomena. In the contemporary philosophical literature on this matter, it is standard to view cognitive science as uncovering the *mechanisms* that underlie cognition. According to a traditional view,

mechanisms are "entities and activities organized such that they are productive of regular changes from start or set-up to finish or termination conditions" (Machamer et al., 2000, p. 3). The overall behavior of the mechanism, delimited by such starting and ending conditions, is also called "phenomenon" (Glennan, 2017; Bechtel and Abrahamsen, 2005).

In this characterization, mechanisms are always systems *for* a certain phenomenon (Darden, 2008). As such, whenever we are trying to uncover a mechanism for a certain phenomenon (say, ψ), we should begin with an adequate description of what ψ is, which effects it has, and what are the typical environmental elements that allow ψ to take place. Once such description of ψ is made, the process of discovering the mechanisms that underlie it begins with the detection of certain elements whenever ψ occurs. After thorough empirical analysis and manipulation of such elements, we figure out that there is a set of elements (say, ϕ) which are consistently active whenever ψ is also active.[4] Then we are closer to the claim that the mechanism for ψ is nothing more than the coordinated functioning of the elements in ϕ (Craver, 2015).

Naturally, the story presented above is vastly simplified. Still, it highlights how mechanism discovery is highly dependent on what we take the higher-order phenomenon to be. For example, if we want to discover what is the mechanism behind how a pocket calculator divides two numbers, we first have to understand how division works. Then we take such description of division and compose a list of steps a system must take in order to divide two numbers. Such list is, naturally, constrained by what we take division to be, but it also constrains which mechanisms are candidates for how the calculator performs division. All possible systems that are not capable of implementing our list of steps are automatically ruled out from our investigation. This is what is commonly called the *top-down constraint* (Bechtel and Richardson, 2010):

Top-down constraint:

We start with a description of a system, S, and its behavior ψ-ing. These characterizations allow us to formulate "how-possibly" models of how S ψ-ies. These models are only implementable on compatible hardware, thereby limiting the range of possible mechanisms that are able to fulfill ψ.

Importantly, top-down constraints are always dependent on a research project and its particularities. The conceptual framework of researchers, the empirical tools available to them, as well as their methods for mathematical modelling, all play a decisive role in constraining their research question and the range of hypotheses that can be formulated and tested (Kästner and Haueis, 2021). In this context, constraining the research question consists in delimiting our characterization of S and its behavior to ψ, which, in turn, bounds which mechanisms for ψ can be discovered.

[4] See Craver (2007), chapter 4, and Baumgartner and Casini (2017) for more discussion.

Kästner and Haueis (2021) explicate this relation between research methods, phenomenon characterization, and mechanistic discovery as three elements of a larger *pattern recognition practice*. Their use of concept "pattern" is directly influenced by the works of Dennett (1991) and Haugeland (1998). In this context, a given collection forms a pattern if, and only if, its individual elements are organized in a given arrangement, such that it can be recognized from a higher level of abstraction that captures the collection of elements as a whole, instead of focusing on individual elements. As such, a pattern is both (1) an orderly arrangement of elements, and (2) a candidate for recognition (Haugeland, 1998, pp. 273-274). Kästner and Haueis apply this conception to understand how ontic (i.e., bottom-up) and epistemic (i.e., top-down) norms constrain mechanistic inquiry:

> "On the one hand, scientific practice with its methods and tools epistemically constrains what patterns in the causal structure of the world can be recognized as mechanisms. On the other hand, patterns in the causal structure ontically constrain which scientific tools will serve to recognize them as orderly arrangements persistent from below and salient from above, respectively" (Kästner and Haueis, 2021, p. 1645).

The way in which top-down constraints are related to practices of pattern recognition supports the thesis that mental attitudes cannot be excluded from cognitive science, nor from naturalistic philosophy. Attitude-terms provide the initial and rough formulation of a certain mental state. After that, we start looking for the patterns of behavior associated with that mental state, usually via a set of experimental tasks that require the employment of the cognitive capacity in question (Francken and Slors, 2014; Kästner and Haueis, 2021). Then we use whichever empirical methods are more adequate to uncover the mechanism (or set of mechanisms) that correlate with the behavioral pattern. While it is likely that there may be multiple possible mechanisms that can underlie the pattern associated with a mental attitude, what matters is that they are all grouped together under the heading of a certain mental attitude term precisely because they produce the pattern of overt behavior associated with that term.

In sum, and in agreement with Robins (2020), there is no incompatibility between describing a mental state using folk psychology and using terms of the cognitive sciences. Quite the contrary, mental attitudes offer a way to refer to general patterns of thought and behavior in such a way that they constrain our mechanistic inquiry of particular cognitive capacities. Given that pattern recognition is inherently perspectival, ascribing mental attitudes and uncovering their mechanisms are also perspective-dependent tasks. Such is the thesis of *interpretivism*: people have beliefs and desires in virtue of the fact that their behavior conforms to a pattern associated with beliefs, desires, and so on. Interpretivism, so constructed, entails that ascribing mental attitudes consists in identifying patterns from a given perspective. This perspective serves as a top-down constraint on mechanistic inquiry, thus granting an important epistemic role for the mental attitudes in the empirical sciences of the mind.

Therefore, the conditional of P3 in the exclusion argument (section 3) is false: the fact that mental attitudes come from folk psychological talk does not entail that they serve no purpose in cognitive science. As such, interpretivism agrees with Robins' (2020) general conclusion and expands her account by saying more on what are mental attitudes, how they can be individuated, and how they serve an important epistemic constraint in the investigations of cognitive science.

4.3 Possible objections

In light of interpretivism and the pattern view of mental attitudes, one could argue that such account is not sufficient for preventing the exclusion of mental attitudes from the empirical sciences of the mind. Even if interpretivism is true, the objection goes, it could still be the case that a complete theory of neurocognitive mechanisms does not mention mental attitudes in any relevant sense, thus eliminating them from a true theory of the mind.

Against this objection, I highlight how mental attitudes, taken as patterns of thought and behavior, serve an epistemic function in the sciences of the mind that cannot be eliminated by a complete description of neurocognitive mechanisms. As mentioned previously, patterns are only detectable once we take a more distant perspective from the *explanandum* phenomenon and, thereby, abstract away details from the functioning of its parts. By definition, we can only detect patterns in coarser-grained descriptions. Such vantage point brings several different epistemic advantages that are not present in finer-grained descriptions of mechanisms. With regards to mental attitudes, they highlight important patterns that may otherwise be missed in a finer-grained mechanistic description. Just like we cannot infer what a computer program is doing solely by looking at its string of binary numbers, being too fine-grained with our description of cognitive states leads us to miss the bigger picture.

Another objection concerns the status of mental attitudes inside the framework of the cognitive sciences. Given that interpretivism takes these attitudes as patterns of thought and behavior, one might question whether scientists should treat them as real entities, or only as useful terms that abstract away some of the nuances of particular mental states. Against this (supposed) ambiguity, I argue that scientists should, and often do, treat patterns as real entities. The metaphysics of patterns allows for them to have properties and causal powers that are not present in the individual constituent parts of the system. For example, biologists recognize how forests, understood as closed ecological systems, have properties that are not present in any individual organism that makes up the forest. In this instance, biologists treat the forest as a real entity independent of any individual organism. My contention with the interpretivist view is that, similar to the case in biology, cognitive scientists should, and often do, take mental attitudes into account as entities that emerge from neurocognitive processes, and not just as useful concepts for abstraction purposes.

5 Interpretivism in philosophy of memory

Let's take stock. The main issue that sparkled this debate was the apparent incompatibility between a naturalistic methodology for philosophy of memory and its recent interest in taking mental attitudes seriously. Such apparent incompatibility is highlighted in *the exclusion argument*. In short, the argument claims that, since mental attitudes are matters of folk psychology and are not intended for explanations of neurocognitive mechanisms, they are neither useful for explanations in cognitive science nor relevant to naturalistic philosophy of memory.

In the previous section, I argued that the premises of the exclusion argument are not sufficient to support its conclusion. I defended that the folk origins of mental attitudes do not exclude the possibility that they are nevertheless necessary for uncovering the mechanisms of cognition. Following interpretivism, mental attitudes are ways of referring to the phenomena that brain mechanisms are responsible for. In this context, correct attitude ascriptions are correlated with relevant neurocognitive systems, despite the fact that such relation between mental attitudes and systems are many-to-many and involve multiple in-between translation steps.

The interpretivist thesis applies to naturalistic philosophy of mind in general. It concludes that such branch of philosophy must take into account the relevant mental attitudes during philosophical investigation. While such broad claims may be sufficient to claim that philosophy of memory should take the "remembering" attitude into account, they fall short of providing specific insight into the problems that philosophers of memory face today. To fill this gap is the aim of the next subsections. Here I focus on the distinction between epistemic and empirical meanings of the term "remembering" (section 5.1), and on (dis)continuism (section 5.2) about the processes of memory and imagination.[5]

5.1 Epistemic and empirical remembering

Related to the (dis)continuism debate, philosophers have recently taken interest on the multiple meanings and uses of the term "remembering". According to Craver (2020), *epistemic remembering* is a set of commitments about the accuracy and reliability of a subject's memory that allow it to be categorized as a ground for knowledge about the past. As such, epistemic remembering refers to the epistemic responsibility of claiming to remember: if someone claims to (epistemically) remember that p, then we have the right to hold that person's memory up to scrutiny. In the case that her mental state fails to meet the criteria of being a reliable and accurate source about the past, then we can say that she was not, in fact, remembering. Meanwhile, *empirical remembering* refers to people's actual, and sometimes faulty, memories and the mechanisms

[5]Naturally, these are not the only problems about which philosophers of memory currently debate. However, due to space constraints, these are the problems I'll be focusing on the most in this paper.

that support it. The empirical sense of "remembering", following Craver, is the performance of a cognitive system in following the commitments of the epistemic sense.

A similar account, though different in specific and important aspects, is developed by McCarroll, Michaelian, and Nanay (2022), who refer to *normative* and *descriptive* perspectives on episodic memory. Their theory differs from Craver's with regards to accounting for the relation between epistemic remembering (or the normative perspective) and empirical remembering (or the descriptive perspective). Craver (2020, p. 267) claims that there is, in principle, no incompatibility between epistemic remembering and empirical remembering, since the norms of the former are neutral when it comes to the mechanistic details of the latter. His claim is based on the fact that, given the epistemic sense of remembering refers to a certain speech act and the epistemic commitments associated with it, and that the empirical meaning concerns the mechanisms that underlie states of picturing a past event, there is no incompatibility in virtue of them being different terms for different objects. Meanwhile, McCarroll, Michaelian, and Nanay (2022, p. 22) view the normative and descriptive perspectives as referring to one and the same object, namely "memory", thus they cannot be used simultaneously in the same context. This is because it is likely that the normative and descriptive perspectives ask different questions about memory and, hence, will have different theories on how it works. These theories and perspectives will be compatible only in so far as they are applied in different contexts.

Interpretivism provides a middle ground for the discussion on whether epistemic and empirical meanings of remembering refer to the same or separate objects. To elucidate my point, I should first discuss the phenomenon of *misremembering*. Following Robins (2016), a paradigmatic example of misremembering for episodic memory is the Deese-Roediger-McDermott (DRM) effect, in which participants consistently report remembering related but absent words from a previous list (Deese, 1959; Roediger and McDermott, 1995). For example, in a list containing *nurse, disease, treatment, diagnosis, vaccine, medicine, hospital*, people tend to incorrectly remember that semantically related words (such as *doctor*) were present in the list. Such experiments are paradigmatic examples of misremembering in episodic memory because they involve the successful retention of previous information, but still result in a false recollection (Robins, 2016, p. 434). To the extent that epistemic remembering involves the commitment to the accuracy of one's mental state, misremembering is a case in which the subject's accuracy commitment comes apart from the actual content of that mental state. This indicates that the commitments of epistemic remembering are not entirely in the memory's content, but instead is how we think about that content. In short, the commitments of epistemic remembering are *attitudes* taken towards a memory content.

Taking epistemic remembering as a mental attitude is further warranted in other ways. Particularly, the fact that we sometimes are doubtful as to whether we are epistemically remembering indicates that there are edge cases

in which the notion of epistemic remembering is not sufficient to clear cut the boundaries of correct memories. This is because, following interpretivism for mental attitudes, epistemic remembering refers to a pattern of how we think about and create rules over our memories. This pattern, learned on our parents' knee (Nelson and Fivush, 2004), is a tendency towards considering our memories as reliable and accurate sources of information about the past, provided we actually experienced the past event or learned about it from reliable testimony (see also Cosmides and Tooby, 2000). The notion of pattern is useful here since it allows for degrees of confidence and reliability in our epistemic claims to remember.[6]

Moreover, taking epistemic remembering as pattern of commitments and considerations about one's memory provides an interesting result on how it relates to empirical remembering. As mentioned previously, Craver (2020) defends that they are mostly independent of each other, since they refer to different objects. In contrast, McCarroll, Michaelian, and Nanay (2022) argue that the epistemic and empirical views refer to the same object, and that they are compatible only in so far as they are applied on different contexts.

The interpretivist view, defended in the previous section, is able to dissolve this discussion. Consider again one of the basic tenants of the mechanistic literature: a phenomenon is the behavior of the mechanism (Glennan, 2017). As such, the behavior of the mechanism is a manifestation of the coordinated functioning of its component parts (Bechtel and Abrahamsen, 2005). In this sense, phenomena are dependent on their mechanisms. In another sense, one cannot eliminate the phenomena from a description of the overall system, since talking in a higher-level of abstraction allows us to pick up regularities that we would have missed otherwise (Dennett, 1991; Kästner and Haueis, 2021). In short, the phenomenon is *metaphysically* dependent on the mechanism, but not *epistemically* so.

As such, considering epistemic remembering as a mental attitude allows us to be more specific on how exactly it depends on the mechanisms of empirical remembering. The former is *metaphysically* dependent on the latter, for it refers to a higher-order pattern that emerges from the particular functionings of a mechanism. Yet, epistemic remembering remains *epistemically* independent of empirical remembering, since any description of the former, being at a higher level of abstraction, can be done without reference to how the pattern is implemented at lower levels. Epistemic remembering is taken as a pattern that emerges from and, hence, is dependent of the proper functioning of memory mechanisms. In this metaphysical sense, the epistemic view is emergent from the coordinated functioning of elements in the empirical view. However, in the epistemic sense, any description of epistemic remembering is independent of the empirical view, since it stands in a different level of abstraction.

[6]It is important to note that the patterns I'm discussing here should be taken as operating at the personal level. While, naturally, there are sub-personal systems that implement this pattern, it only concerns the behavior of entire persons, not particular mechanisms. I thank an anonymous reviewer for pressing me on this point.

In short, I agree with Craver on the (epistemic) independence of the two meanings of remembering. At the same time, I concur with McCarroll, Michaelian, and Nanay on the intuition that both senses of remembering refer to the same object: it seems that way given the metaphysical dependence of epistemic sense to the empirical sense. That is not to say, however, that one can reduce the former to the latter: the relation of emergence only holds when elements of a mechanism work together in a very specific way, so much so that the overall behavior of the system cannot be reduced to the behavior of a single component.

5.2 An interpretivist view on (dis)continuism

The interpretivist thesis also has important implications as to whether episodic memory and imagination are continuous or discontinuous. There are several issues at stake here, for there is more than one way of asking for the relation between remembering and imagining. Firstly, there is the question of whether they belong to the same natural kind (Cheng and Werning, 2016; Werning, 2020; Andonovski, 2018). Secondly, and relatedly, one might ask how (dis)similar are the mechanisms that underlie episodic memory and imagination (Perrin, 2016; Michaelian, 2016a), and whether these mechanisms support the same function both in remembering and imagining (Robins, 2022a). Thirdly, one could ask whether the attitudes of remembering and imagining are (dis)continuous (Sant'Anna, 2021; Langland-Hassan, 2022).

All of these issues can be approached within the interpretivist framework. Starting with the issue of mental attitudes, interpretivism considers them as overall patterns of behavior. Taking patterns as both a non-random organization of elements and as candidates for recognition indicates that they are only detectable and, hence, only make sense within a given perspective (Haugeland, 1998). In this regard, demarcating the mental attitudes of remembering and imagining is a function of which framework we are working on and what characteristics we deem relevant for individuating them. If we start from a conceptual framework that abstracts away the epistemic and folk psychological differences between remembering and imagining, and only treats them as different forms of judgements towards mental imagery, then continuism would likely prevail. Instead, if we focus on how the attitude of remembering has particular connotations on the accuracy of its content, then discontinuism would likely succeed. Those are only two examples of the types of initial frameworks we can take on the patterns of remembering and imagining that will yield different results on the (dis)continuism problem.

On the question of whether episodic memory and imagination belong to the same natural kind, most philosophers tend to adopt the homeostatic property cluster theory of kinds (HPC, for short), made famous by Boyd (1991). This theory binds the natural kinds question with the issue about mechanisms: i.e., the natural kinds of memory and imagination are determined in virtue of their mechanisms. If they are the same, then continuism is true; if they are

not, discontinuism follows. Considering how marking the boundaries of mechanisms is top-down constrained on our characterization of the *explanandum* phenomenon (see section 4.2), it stands to reason that delineating the mechanisms of memory and imagination will also be so constrained. Moreover, given that such constraint is, by definition, dependent on a research project, any answer (dis)continuism will also particular to the research project and interests at hand.

As De Brigard (2018) claims, to correlate a mental state with a neurocognitive system involves an act of interpretation. Using the concept of patterns, we can see how whichever patterns we can encounter with such interpretation is dependent on the perspective and research project at hand. In this regard, to determine whether episodic memory is (dis)continuous with imagination is, ultimately, a matter of perspective. There is no straightforward fact of the matter on the relation between remembering and imagining. Instead, it depends on what we want to explain. Hence, interpretivism entails *pluralism* about (dis)continuism.

This account advances the diagnosis proposed by McCarroll et al. (2022) on the debate between the causal and simulation theories of memory. According to them, each theory may be best understood from a particular perspective: the causal theory is the better option from a normative perspective, and the simulation theory, from a descriptive perspective. Interpretivism expands their account by allowing for a greater range of possible perspectives that, not only take different stances on causalism *versus* simulationism, but also yield different results on the (dis)continuity between memory and imagination. It could be the case, for example, that researchers in a particular perspective from cognitive neuroscience have more reasons to adopt continuism, given their interest in neurocognitive mechanisms and so on (e.g., Addis, 2020), but, from a computational point of view, memory necessitates processes that are not applicable to imagination, thus leading us to adopt discontinuism. McCarroll et al. would probably take neuroscientific and computational frameworks as belonging to the descriptive perspective, but, given how they produce different outcomes for (dis)continuism, I maintain that they should be kept separated.

6 Summary and conclusions

The (dis)continuism problem asks if episodic memory is continuous with imagination. Given its close proximity with the cognitive sciences, philosophers have traditionally taken this issue as part of a larger naturalistic framework of philosophy of memory. Recently, Robins (2020) argued that such naturalistic methodology necessitates the need for philosophers to also take the attitudes of remembering and imagining into account. However, given that mental attitudes are folk psychological constructs and, hence, are not intended for scientific explanations of the mind, one could argue that it is unlikely that "remembering" and "imagining" have any significant role in naturalistic philosophy. Such is the *exclusion argument*, which was the main motivation for this paper.

The present article discussed a way of circumventing the exclusion argument and more precisely argue for what roles should mental attitudes have in naturalistic philosophy of memory. Robins herself responds to a similar argument against mental attitudes in naturalistic philosophy, but her account still lacks a more precise characterization of how these attitudes can be individuated, and which role they serve in cognitive science. In this paper, I defended a framework that is able to fill these gaps, called *interpretivism*. It claims that mental attitudes refer to patterns of thought and behavior which, in turn, are supported by cognitive mechanisms. Given that mechanisms are partially demarcated by what they do, there is a top-down constraint between the way in which we characterize the overall pattern, with mental attitudes, and how we go about uncovering mechanisms *for* that pattern. As such, interpretivism highlights how mental attitudes function as guides to mechanistic discovery and, thereby, defends the consideration of "remembering" and "imagining" attitudes into naturalistic philosophy of memory.

Moreover, interpretivism provides a novel account for the relation between epistemic remembering and empirical remembering. As Craver (2020) claims, epistemic remembering consists in the set of norms and implications of claiming to remember. Empirical remembering, on the other hand, refers to the mechanisms active in our day-to-day memories, which are often far from the fulfilment of the epistemic norms of remembering. While Craver defends that these two meanings of remembering refer to different objects, McCarroll, Michaelian, and Nanay (2022) argue that they have only one referent — i.e., memory. Following interpretivism, and taking epistemic remembering as a mental attitude, I explicated how the epistemic view is metaphysically, but not epistemically, dependent on the empirical view. As such, I agree with Craver on their (epistemic) independence, but also concur with McCarroll's et al. intuition that these meanings refer to the same object.

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References

Addis, D.R. 2020. Mental time travel? A neurocognitive model of event simulation. *Review of Philosophy and Psychology 11*(2): 233–259. https://doi.org/10.1007/s13164-020-00470-0 .

Anderson, M.L. 2015. Mining the Brain for a New Taxonomy of the Mind. *Philosophy Compass 10*(1): 68–77. https://doi.org/10.1111/phc3.12155 .

Andonovski, N. 2018. Is episodic memory a natural kind? *Essays in Philosophy 19*(2): 178–195 .

Andonovski, N. and K. Michaelian. 2024. Naturalism and Simulationism in the Philosophy of Memory, In *Naturalism and Its Challenges*, eds. Kemp, G.N., A.H. Khani, H.S. Rezaee, and H. Amiriara, Routledge Studies in Contemporary Philosophy. New York, NY: Routledge.

Anscombe, G. 1963. *Intention* (2nd ed.). Cornell University Press.

Atance, C.M. and J.A. Sommerville. 2014. Assessing the role of memory in preschoolers' performance on episodic foresight tasks. *Memory 22*(1): 118–128 .

Baumgartner, M. and L. Casini. 2017. An Abductive Theory of Constitution. *Philosophy of Science 84*(2): 214–233. https://doi.org/10.1086/690716 .

Bechtel, W. and A. Abrahamsen. 2005. Explanation: A mechanist alternative. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences 36*(2): 421–441 .

Bechtel, W. and R.C. Richardson. 2010. *Discovering Complexity: Decomposition and Localization as Strategies in Scientific Research* (MIT Press ed. ed.). MIT Press.

Ben-Yami, H. 1997. Against Characterizing Mental States as Propositional Attitudes. *The Philosophical Quarterly 47*(186): 84–89. https://doi.org/10.1111/1467-9213.00049 .

Bernecker, S. 2010. *Memory: A Philosophical Study*. Oxford University Press.

Boyd, R. 1991. Realism, anti-foundationalism and the enthusiasm for natural kinds. *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition 61*(1/2): 127–148 .

Cheng, S. and M. Werning. 2016. What is episodic memory if it is a natural kind? *Synthese* 193: 1345–1385 .

Churchland, P.M. 1981. Eliminative Materialism and the Propositional Attitudes. *The Journal of Philosophy 78*(2): 67. https://doi.org/10.2307/2025900 .

Churchland, P.M. 1989. Folk Psychology and the Explanation of Human Behavior. *Philosophical Perspectives* 3: 18 .

Cosmides, L. and J. Tooby. 2000. Consider the source: The evolution of decoupling and metarepresentations, In *Metarepresentations: A Multidisciplinary Perspective*, ed. Sperber, D. Oxford University Press.

Craver, C.F. 2007. *Explaining the Brain: Mechanisms and the Mosaic Unity of Neuroscience*. Oxford University Press.

Craver, C.F. 2015. Levels, In *Open MIND*, eds. Metzinger, T. and J.M. Windt. MIND Group.

Craver, C.F. 2020. Remembering: Epistemic and empirical. *Review of Philosophy and Psychology 11*(2): 261–281. https://doi.org/10.1007/s13164-020-00469-7 .

Darden, L. 2008. Thinking again about biological mechanisms. *Philosophy of science 75*(5): 958–969 .

De Brigard, F. 2013. Is memory for remembering? Recollection as a form of episodic hypothetical thinking. *Synthese. An International Journal for Epistemology, Methodology and Philosophy of Science 191*(2): 155–185. https://doi.org/10.1007/s11229-013-0247-7 .

De Brigard, F. 2015. What Was I Thinking? Dennett's Content and Consciousness and the Reality of Propositional Attitudes, In *Content and Consciousness Revisited: With Replies by Daniel Dennett*, eds. Muñoz-Suárez, C. and F. De Brigard, Number 7 in Studies in Brain and Mind. Springer.

De Brigard, F. 2018. Memory and the intentional stance, In *The Philosophy of Daniel Dennett*, ed. Huebner, B. Oxford University Press.

De Brigard, F., D.R. Addis, J.H. Ford, D.L. Schacter, and K.S. Giovanello. 2013. Remembering what could have happened: Neural correlates of episodic counterfactual thinking. *Neuropsychologia 51*(12): 2401–2414. https://doi.org/10.1016/j.neuropsychologia.2013.01.015 .

Deese, J. 1959. Influence of Inter-Item Associative Strength upon Immediate Free Recall. *Psychological Reports 5*(3): 305–312. https://doi.org/10.2466/pr0.1959.5.3.305 .

Dennett, D.C. 1988. Précis of The Intentional Stance. *Behavioral and Brain Sciences 11*(03): 495. https://doi.org/10.1017/S0140525X00058611 .

Dennett, D.C. 1991. Real Patterns. *The Journal of Philosophy 88*(1): 27. https://doi.org/10.2307/2027085 .

Dennett, D.C. 2009. Intentional Systems Theory, In *The Oxford Handbook of Philosophy of Mind* (1 ed.)., eds. Beckermann, A., B.P. McLaughlin, and S. Walter, 339–350. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199262618.003.0020.

Dewhurst, J. 2021. Folk Psychological and Neurocognitive Ontologies, In *Neural Mechanisms*, eds. Calzavarini, F. and M. Viola, Volume 17, 311–334. Springer International Publishing. https://doi.org/10.1007/978-3-030-54092-0_14.

D'Argembeau, A. and M.v.d. Linden. 2006. Individual differences in the phenomenology of mental time travel: The effect of vivid visual imagery and emotion regulation strategies. *Consciousness and cognition 15*(2): 342–350 .

Emery, N. 2023. *Naturalism beyond the limits of science: how scientific methodology can and should shape philosophical theorizing.* Oxford University Press.

Fodor, J.A. 1981. Propositional Attitudes, In *The Language and Thought Series*, ed. Block, N. Harvard University Press. https://doi.org/10.4159/harvard.9780674594722.c5.

Fodor, J.A. 1987. *Psychosemantics: The Problem of Meaning in the Philosophy of Mind.* MIT Press.

Fodor, J.A. 1992. *A Theory of Content and Other Essays* (4. print ed.). A Bradford Book. MIT Press.

Francken, J.C. and M. Slors. 2014. From commonsense to science, and back: The use of cognitive concepts in neuroscience. *Consciousness and Cognition* 29: 248–258. https://doi.org/10.1016/j.concog.2014.08.019 .

Glennan, S. 2017. *The New Mechanical Philosophy* (First edition ed.). Oxford University Press.

Haugeland, J. 1998. Pattern and being, *Having Thought. Essays in the Metaphysics of Mind*, 267–290. Harvard University Press.

Keeley, B. 2016. Natural Mind, In *The Blackwell Companion to Naturalism* (1° edition ed.)., ed. Clark, K.J., 196–208. Wiley Blackwell.

Kornblith, H. 2002. *Knowledge and Its Place in Nature.* Clarendon Press ; Oxford University Press.

Kornblith, H. 2017. A naturalistic methodology, In *The Cambridge Companion to Philosophical Methodology*, ed. Overgaard, S., Cambridge Companions. Cambridge University Press.

Kästner, L. and P. Haueis. 2021. Discovering Patterns: On the Norms of Mechanistic Inquiry. *Erkenntnis 86*(6): 1635–1660. https://doi.org/10.1007/s10670-019-00174-7 .

Langland-Hassan, P. 2022. Remembering and Imagining: The Attitudinal Continuity, In *Philosophical Perspectives on Memory and Imagination*, eds. Berninger, A. and I. Vendrell Ferran, Routledge Studies in Contemporary Philosophy. Routledge.

Machamer, P., L. Darden, and C.F. Craver. 2000. Thinking about mechanisms. *Philosophy of science 67*(1): 1–25 .

McCarroll, C.J., K. Michaelian, and B. Nanay. 2022. Explanatory Contextualism about Episodic Memory: Towards A Diagnosis of the Causalist-Simulationist Debate. *Erkenntnis*. https://doi.org/10.1007/s10670-022-00629-4 .

McLelland, V., D.L. Schacter, and D.R. Addis. 2015. Contributions of Episodic Memory to Imagining the Future, In *The Wiley Handbook on The Cognitive Neuroscience of Memory*, eds. Addis, D.R., M. Barense, and A. Duarte, 287–308. Wiley Blackwell.

Michaelian, K. 2016a. Against discontinuism: Mental Time Travel and Our Knowledge of Past and Future Events, In *Seeing the Future: Theoretical Perspectives on Future-Oriented Mental Time Travel*, eds. Michaelian, K., S.B. Klein, and K.K. Szpunar. Oxford University Press.

Michaelian, K. 2016b. *Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past*. MIT Press.

Michaelian, K. and D. Perrin. 2017. Mental Time Travel, In *The Routledge Handbook of Philosophy of Memory*, eds. Sven Bernecker and Kourken Michaelian, Routledge Handbooks in Philosophy. Routledge, Taylor & Francis Group.

Nelson, K. and R. Fivush. 2004. The emergence of autobiographical memory: a social cultural developmental theory. *Psychological review 111*(2): 486 .

Perrin, D. 2016. Asymmetries in Subjective Time, In *Seeing the Future: Theoretical Perspectives on Future-Oriented Mental Time Travel*, eds. Michaelian, K., S.B. Klein, and K.K. Szpunar. Oxford University Press.

Poldrack, R. 2006. Can cognitive processes be inferred from neuroimaging data? *Trends in Cognitive Sciences 10*(2): 59–63. https://doi.org/10.1016/j.tics.2005.12.004 .

Price, C.J. and K.J. Friston. 2005. Functional ontologies for cognition: The systematic definition of structure and function. *Cognitive Neuropsychology 22*(3-4): 262–275. https://doi.org/10.1080/02643290442000095 .

Quine, W.V. 2004. Epistemology naturalized, In *Quintessence: Basic Readings from the Philosophy of W.V. Quine*, ed. Gibson, R.F., 259–274. Belknap Press of Harvard University Press.

Robins, S. 2022a. Episodic memory is not for the future, In *Current Controversies in Philosophy of Memory*, eds. Sant'Anna, A., C.J. McCarroll, and K. Michaelian. Abingdon, Oxon: Routledge.

Robins, S. 2022b. The Role of Memory Science in the Philosophy of Memory. *Philosophy Compass 17*(10). https://doi.org/10.1111/phc3.12880 .

Robins, S.K. 2016. Misremembering. *Philosophical Psychology 29*(3): 432–447. https://doi.org/10.1080/09515089.2015.1113245 .

Robins, S.K. 2020. Defending discontinuism, naturally. *Review of Philosophy and Psychology 11*(2): 469–486 .

Roediger, H.L. and K.B. McDermott. 1995. Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition 21*(4): 803–814. https://doi.org/10.1037/0278-7393.21.4.803 .

Sant'Anna, A. 2021. Attitudes and the (dis)continuity between memory and imagination. *Estudios de Filosofía* (64): 73–93. https://doi.org/10.17533/udea.ef.n64a04 .

Schacter, D.L. and D.R. Addis. 2007. The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society B: Biological Sciences 362*(1481): 773–786. https://doi.org/10.1098/rstb.2007.2087 .

Schroeder, T. 2006. Propositional Attitudes. *Philosophy Compass 1*(1): 65–73. https://doi.org/10.1111/j.1747-9991.2006.00010.x .

Stich, S.P. 1985. *From Folk Psychology to Cognitive Science: The Case against Belief* (5th print ed.). A Bradford Book. MIT Press.

Teroni, F. 2018. On seeming to remember, In *New Directions in the Philosophy of Memory*, eds. Michaelian, K., D. Debus, and D. Perrin, 329–345. Routledge.

Thomasson, A.L. 2017. What Can We Do, When We Do Metaphysics?, In *The Cambridge Companion to Philosophical Methodology* (1 ed.)., eds. D'Oro, G.

and S. Overgaard, 101–121. Cambridge University Press. https://doi.org/10.1017/9781316344118.007.

Tulving, E. 1972. Episodic and semantic memory, In *Organization of Memory*, eds. Tulving, E. and W. Donaldson. Academic Press.

Tulving, E. 1985. Memory and consciousness. *Canadian Psychology/Psychologie canadienne 26*(1): 1 .

Werning, M. 2020. Predicting the past from minimal traces: Episodic memory and its distinction from imagination and preservation. *Review of Philosophy and Psychology 11*(2): 301–333. https://doi.org/10.1007/s13164-020-00471-z .