



# Mental Time Travel and Disjunctivism

István Aranyosi<sup>1</sup>

Published online: 10 March 2020  
© Springer Nature B.V. 2020

## Abstract

The paper discusses radical constructivism about episodic memory as developed by Kourken Michaelian under the name of “simulationism”, a view that equates episodic memory with mental time travel. An alternative, direct realist view is defended, which implies disjunctivism about the appearance of remembering. While admitting the importance of mental time travel as an underlying cognitive mechanism in episodic memory, as well as the *prima facie* reasonableness of the simulationist’s critique of disjunctivism, I formulate three arguments in defense of disjunctivism, which thus appears to be a feasible alternative to radical constructivism.

Yesterday I missed our departmental meeting. I know what the agenda was, and I can easily and vividly imagine what each of my colleagues roughly said; I have many years of experience with what my colleagues typically say in such meetings, and I can even imagine their typical gestures, tone of voice, verbal and non-verbal idiosyncrasies, etc.. I am, in other words, a *reliable veridical imager* of what is said in our departmental meetings. Suppose I imagine what Bill said related to the issue of whether this year we should reduce the number of accepted students for graduate studies. Let’s denote this set of sentences by **S**. As it happens, what Bill actually said yesterday is pretty much what **S** contains, so what I have just imagined is accurate enough to count as *matching* what Bill said. My colleague Simon, on the other hand, was there yesterday. He recalls what Bill said. What he reports is a set of sentences **S\***, which is pretty much what Bill said, hence, just like my imagined set **S**, it counts as *matching* what Bill said. It is not controversial that one of us, Simon, remembers what Bill said. But according to a radical version of constructivism about episodic memory, *both of us* remember it.

Here is Kourken Michaelian expressing this view:

(...) the point to note is simply that episodic memory is currently viewed, by most psychologists working the area, as one instance of a more general capacity

---

✉ István Aranyosi  
istvanaranyosi@gmail.com

<sup>1</sup> Bilkent University, Ankara, Turkey

allowing the agent both to re-experience past episodes and to “pre-experience” possible future episodes. (Michaelian 2016a: 98)

Though talk of “re-experiencing” past episode suggest, *prima facie*, that Michaelian requires that the past episode be experienced first, in order to be remembered later, this is not actually the case. As he makes it clear later (Michaelian 2016a: 118–9), experience of an episode, *e*, is *not required* for what he means by “re-experiencing” *e*. Of course, *usually*, such an experience did occur whenever we remember, but it is not a necessary condition for remembering. Michaelian’s version of constructivism, which he calls “simulationism”, stresses the idea, put forward initially by Endel Tulving (2011), that mental time travel, a form of episodic imagination, which is not constrained by temporal directionality (i.e. it can be past- or future-directed), is the single cognitive capacity that underlies, and thus is able to explain, episodic remembering. Deploying this capacity is taken as sufficient for memory if the content that is generated by it *matches* the facts of the past. I will call this type of view (*viz.* the one according to which remembering does not require preservation of *any* content) “radical constructivism” (RADCON), and distinguish it from “moderate constructivism” (MODCON), which is the view that remembering can involve the addition of new content but still requires the preservation of *some* content.<sup>1</sup>

It would be easy (and in my view correct) at this point to simply use my little story about the departmental meeting as a *reductio* of RADCON. Yet, the radical constructivist is unfazed by such alleged counterexamples; he is ready to bite the bullet (which he does not see as bullet-biting at all) and promote revision of our ordinary concept of remembering. For this reason, my main goal in the paper is not to try to refute RADCON, but to discuss one of its stronger points when it comes to the metaphysics and analysis of remembering: the reply to the direct realist view of memory, and, more specifically, to the required disjunctive understanding of assertions of the sort “I seem to remember *p*”.

My primary goal is, then, mainly to defend disjunctivism from the attacks coming from the side of RADCON. The overall dialectic is as follows. Both RADCON and direct realism are alternative theories of episodic remembering relative to the influential causal theory. While RADCON appears counterintuitive, its champion will point out that direct realism implies disjunctivism, which is more implausible or more counterintuitive than RADCON. Hence, one way to argue for direct realism is to make disjunctivism about memory appear as a reasonable view.

<sup>1</sup> Though the idea of generativity is commonplace in psychology, initially MODCON was considered an iconoclastic view in philosophy. Lately, however, more and more philosophers subscribe to it (e.g. Dokic 2001; Lackey 2005; Matthen 2010; Michaelian 2011). RADCON is truly radical, and I am only aware of Michaelian 2016a where it is explicitly defended, though Fernandez 2018 puts forward a functionalist theory of episodic remembering which seems to imply that RADCON is correct. More exactly, Fernandez’s role functionalism about remembering is the view that for any subject *S* and event *e*, *S* remembers *e* just in case *S* has some mental image *i* that satisfies what Fernandez calls the “mnemonic role”, namely: *i* tends to cause in *S* a disposition to believe both that *e* happened and that *S* experienced *e* to happen, and *i* tends to be caused in *S* by having experienced *e* to happen (Fernandez 2018: 64). The causal conditions on *i* (that is, on imagery) states a *tendency*, not an actual cause. This is similar to Michaelian’s condition on remembering which states that the current mental state tokened when episodically remembering the past is brought about by a system that reliably generates content that matches events experienced in the past.

My secondary goal is to also raise some critical issues in connection with Michaelian's discussion and commitment to RADCON. These issues will focus on the question of whether the view is really coherent.

Here is the plan. In the first section, I introduce the idea of a direct realist approach to memory, which is an alternative post-causal theory, a rival to constructivism, emphasizing the need to assume disjunctivism about mnemonic experience, if the theory is to cohere with what we know from the perception literature. In section 2, I consider the main criticism against disjunctivism and the alternative simulationist picture of memory, based on mental time travel. In section 3, I expound the case against RADCON. In the last section, I put forward three arguments to defend disjunctivism, and I clarify how exactly the idea of mental time travel contributes to the analysis of remembering.

## 1 Direct Realism and Disjunctivism

Direct realism is a view that has made a career in the philosophy of perception. For this reason, I assume it is what has been established within the literature on perception that should guide us in formulating it in the case of memory. Though the ordinary idea that in perception we are aware of objects in the environment directly is *prima facie* clear enough, it turns out that we need to be more precise than this and distinguish very clearly between direct realism and any other view, be it phenomenalist/idealist or indirect/representative realist. The way philosophers of perception have agreed this should be done (e.g. Crane 2006; Nanay 2016; Nudds 2009) is to posit a *relation* between a perceiver, *P*, and a concrete external object, *O*, and identify it with the (veridical) perception of *O*. There are two independent claims which together define direct realism about perception:

*(Realism)* To perceive an object *O* means to instantiate a perceptual relation to it. It is assumed that a relation exists only when its relata exist, thus, to perceive an object *O* entails that that object exists.

*(Directness)* If in perception an object appears as a concrete material object, then it is a concrete material object, as the relevant relation between perceptual state and its object is *containment* – the perceptual object is a *constituent* of the perceptual state.

We can synthesize these claims by stating, simply, that when we perceive them, material objects are literally constituents of our perceptual states.

As opposed to this, we have a range of possible rival views. For instance, a phenomenalist sense datum theory denies *Directness*, but affirms *Realism*: sense data are objects to which the perceiver is related, they exist; yet they are not concrete material objects, but mental ones.<sup>2</sup> A *representative* realist sense datum theory, on the other hand, denies *Realism* and affirms *Directness* since according to this view, in

<sup>2</sup> One might also interpret sense datum theory as affirming directness since sense data are primary objects of subjective acquaintance. I prefer to interpret it as involving indirect access to the perceptual objects, because, contrary to our naïve beliefs, according to sense datum theory we are not related to material objects, but to ideal ones constructed out of sense data.

perception, one is *indirectly* related to existing material objects which one accesses *through* sense data, themselves standing in a certain relation to the material objects.<sup>3</sup> Finally, another view, more popular in contemporary philosophy of perception than any view committed to sense data, is intentionalism, which posits that perception is an intentional state and that the object of perception is similar in logical behavior to objects of intentional states such as beliefs or desires.<sup>4</sup> The view is sometimes combined with adverbialism, which is a strategy to explain away sense data by analyzing apparent commitment to mental particulars into *ways of perceiving* material objects.<sup>5</sup>

Though it has a venerable history, having been defended in the past by figures like Thomas Reid and Bertrand Russell (at one point in his career), direct realism about memory is not a popular view. Until recently, it hasn't even been properly defined and explicated.<sup>6</sup> The perception literature can serve as a clear enough guide to how this view should apply to memory. To be a direct realist about memory is, by analogy with the case of perception, to subscribe to the view that the past events, objects, states of affairs are literally *constituents* of one's mnemonic states. In other words, when one remembers, say, an event, *e*, *e* is a constituent of one's mental state, *M*, of remembering *e*. Though in the case of perception the direct realist view might be more plausible than others from the point of view of naïve commonsense, it is not quite so when applied to memory. The main obstacle is time. Commonsense tells us that the objects or events we remember are not *present* anymore, hence, our relation to them cannot be direct, but via some image, representation or memory trace. Indeed, this problem has been dubbed and addressed by Sven Bernecker (2008) as “the co-temporality objection”.<sup>7</sup>

It is not my goal here to defend direct realism about memory from this and other objections (I do it elsewhere (Aranyosi 2020), where I elaborate the view in detail), but rather to argue that it is a good alternative postcausal approach to memory, and may even be preferable to the RADCON interpretation of memory as mental time travel. I adopt the phrase “postcausal” from Michaelian and Robins (2018), as I think it is a fortunate terminology for expressing the thought that many of the more recent accounts of remembering in the literature can be considered as *alternatives* to the causal theory (Martin and Deutscher 1966),

<sup>3</sup> For a defense of sense datum theories, see Howard Robinson 1994.

<sup>4</sup> Classic proposals and defenses are Elizabeth Anscombe 1965 and David Armstrong 1968: ch. 11. The stronger, recent view that representational properties determine phenomenal ones in perception is defended, among others, in Alex Byrne 2001. The stronger view is not essential to hold for an intentionalist about perception.

<sup>5</sup> For a rich analysis and defense of adverbialism, see Michael Tye 1984.

<sup>6</sup> I address this problem in Aranyosi 2020. The best account of what direct realism about memory should look like is in Dorothea Debus 2008.

<sup>7</sup> I should note that there is an analogous problem in perception when it comes to the issue of time, namely, that there is always a time lag between when the visual information is emitted (by photon reflection/absorption) by an object and when it reaches our eyes. It is quasi-immaterial when we perceive close enough objects, but it becomes a problem for direct realists when we perceive extremely distant ones, such as stars. It is not the place here to dedicate a proper discussion to this time-lag argument against direct realism, propounded by Bertrand Russell (1948: 217), but it will suffice to note that whereas awareness of a time-lag in perception comes to surface in special circumstances (viz. with objects an astronomical distances), such a time lag is *ubiquitous* in memory. Hence, it is an immediate apparent quandary in the case of direct realism about memory. Thanks to an anonymous referee for asking me to address this issue.

which has been the dominant view in the field of philosophy for several decades. More exactly, a theory of episodic memory being postcausal means that according to the theory, whether there are memory traces of an experienced event –hence, a causal link between the event and the current mental state of remembering– plays no role in deciding whether a current mental state qualifies as memory. In other words, the causal link posited by the causal theory is neither necessary, nor sufficient for remembering according to postcausal theories. One way to be post-causal about remembering is to adopt RADCON and hence deny the necessity of a causal connection between the past states of affairs and the current content generation. This amounts to replacing the causal connection with a weaker relation – we shall see in the next section how it is supposed to work. But another way is to replace the causal connection with a *stronger* relation; indeed, direct realism about any mind-world nexus is characterized by the constitutive relationship between mental states and their worldly contents.<sup>8</sup> The relation of *being a constitutive part of* is stronger than that of *being a cause of*. The latter is standardly taken as contingent, the former as necessary and as conferring identity and individuation conditions.

How does disjunctivism come into the picture? To see this, we need to turn again to how things are supposed to work out for a direct realist about perception. It is widely agreed upon that the direct realist must address the problem of hallucination, that is, of phenomenal states that lack a concrete perceptual object but are subjectively indistinguishable from states of veridical perception. The reason is that it is precisely the arguments from hallucination and from illusion that are supposed to change one's initial, ordinary, naïve realist tentative view about perception. I leave the problem of illusion for direct realists aside in this essay,<sup>9</sup> and focus only on hallucination, as I think it is more directly relevant to the problems related to remembering. The problem for direct realism seems to be that the possibility of hallucinations that are not recognized as such, and for which no amount of introspection could prove that they are not cases of genuine, veridical perception, points to the existence of a common element or common factor in both veridical perception and in hallucination, which, then, must be the genuine *immediate* object of any perceptual experience. Thus, if there is such an object, it is not the concrete extra-mental reality, but some mind-dependent item. Hence, the argument goes, direct realism is false.

The direct realist response is to deny that one should reify subjective indistinguishability into a bona fide object or veil of perception. Indistinguishability is a purely epistemic notion and does not force one to derive any metaphysical conclusions from it. Indeed, the denial of the existence of a common factor between perception and hallucination, which, in turn, form a *kind*, is a core

<sup>8</sup> It is important to emphasize that it is worldly contents, that is, bits of concrete reality that enter this relation according to genuine direct realism. Tufan Kıymaz raised with me the issue of whether one could be direct realist about memory but intentionalist about perception. At first sight it seems so, but further inspection reveals that such a position would not be genuinely direct realist about memory. It would simply be equivalent to a classical preservationist view, according to which it is a mental representation of a perceived event that gets preserved and then retrieved when we remember. A further worry, expressed by one of the referees of this paper, is that under such a view, memory representations depend on a previous mode of access to the relevant events or objects, and it is hard to see how an indirect mode of access to something could give rise to a more direct mode of access to it at a later time.

<sup>9</sup> Recent discussion include Burge 2005, Byrne 2009, Smith 2010.

commitment of direct realists (Martin 1997; Martin 2004). The denial of this ‘highest common factor assumption’ (McDowell 1982) or ‘common kind assumption’ (Martin 2004) naturally leads to a so-called disjunctive analysis of appearance-statements, or of ‘looks’. A statement like ‘It visually appears to me as if there is a red apple on the table’ is to be analyzed, according to disjunctivists, into ‘Either I see a red apple, or I hallucinate one’. This disjunctive analysis was first put forward by Hinton (1973), and the essential point is that this is the *ultimate* level of analysis of experience; in other words, there is nothing in common to the two disjuncts (i.e. nothing more basic) that would itself constitute a *kind* and from which these disjuncts would conceptually emerge (Child 1994: 144).<sup>10</sup>

As I mentioned at the outset, I am interested in the concept of remembering and in whether a revisionary move, like the one put forward by simulationists, is needed and justified. Consequently, since the debate over disjunctivism in the philosophy of perception is mostly about the concept of perceiving, it will be, in my view, a good model for my purposes.

If the perceptual case is to be of any guidance when it comes to direct realism about memory – and we have nothing better to serve as a guide – then disjunctivism should be embraced as an implication of such a view. Disjunctivism about what, exactly? A good candidate is the experience of seeming to remember, that is, a sentence like ‘I seem to remember (the event) *e*’; it would then be analyzed as ‘Either I remember *e*, or I merely seem to remember *e*’. Applying the same recipe as in the case of perception, we would be committed to the idea that there is no common factor or common kind that subsumes both remembering and merely seeming to remember, the reason being that the mental state or event of remembering contains, literally, a part of the concrete past, whereas the state or event of merely seeming to remember does not.

What we have established so far is the following. Direct realism about memory plausibly requires commitment to disjunctivism about it; this much the champion of RADCON (like Michaelian) is right about. However, he then goes further and argues that, whatever one’s view regarding disjunctivism about perception is, when it comes to going disjunctivist about memory or the experience of remembering, the move is unjustified and counterintuitive. In what follows, then, I will first elaborate on the constructivists’ arguments against disjunctivism about remembering, then put forward a few arguments of my own in response.

## 2 The Constructivist Case against Disjunctivism

Though, as I have already pointed out, I do think RADCON is an untenable view, I also think that when it comes to disjunctivism it does have a point; in effect, its criticism of disjunctivism appears to be the reasonable element in RADCON. Michaelian puts

<sup>10</sup> The disjunctive analysis was to be embraced and further elaborated much later by a number of authors, in works related to the problems of perception, such as Snowdon 1990, 2008, McDowell 1982, 1986, Martin 2002, 2004, 2006, Campbell 2002, Byrne and Logue 2008.

forward a powerful objection to disjunctivism about memory, based on empirical facts about the experience and the psychology of remembering:

‘Bernecker argues that the direct realist can resist the argument from illusion by adopting a form of disjunctivism about memory analogous to disjunctivism about perception—that is, by maintaining that genuine and illusory memory are states of different kinds, with the subject being in direct contact with a past episode in the case of genuine remembering, but in contact with an internal representation in the case of illusory remembering. Again, while this is technically correct, adopting disjunctivism is a high price to pay for preserving direct realism. Disjunctivism about memory, like disjunctivism about perception, portrays a unified phenomenon as something fundamentally disunified. While disjunctivism may be coherent as an account of our concept of remembering (Debus 2008), it thus has little appeal as part of an account of remembering as a psychologically real process. Accurate and illusory memories are products of one and the same cognitive process; while the process produces an inaccurate representation in the latter case, it nevertheless remains the same process that is at work in the former case.’ (Michaelian 2016a: 63–64)

Michaelian argues, in effect, that mental time travel (MTT) is the one, fundamental, and psychologically real cognitive process which underlies both veridical and non-veridical cases of seeming to remember. This idea of a unique such process is a recurrent theme in Michaelian’s book. MTT is a complex psychological phenomenon which spans over at least two domains: phenomenological and neural. There appears to be a unity to MTT in both of these domains, when it comes to the question of whether there is a real distinction between memory and imagination – the closest distinction to the veridical/non-veridical memory dichotomy.<sup>11</sup>

To start with neuroscience, a growing body of empirical evidence based on imaging studies has indeed established that the same neural mechanism underlies both episodic memory and episodic imagination, the latter including both past and future oriented processes (Addis et al. 2007; Szpunar et al. 2007); and as early as in 1985 Tulving (1985) already linked the ability to remember the past with the ability to imagine the future, based on the observation of amnesic patients also being impaired with respect to imagination.

Regarding phenomenology, arguably, to remember episodically is to entertain certain imagistic representations of past experiential events. In this way the phenomenology of remembering the past is not different from that of *imagining* the past.<sup>12</sup> And since imagination does not intrinsically distinguish past-orientation and future-orientation as different in kind, what follows is that even past-orientation is not a fundamental element of episodic memory. There is, in

<sup>11</sup> A referee asks why I think that episodic memory and imagination are similar; I myself do not think so, but for the sake of this paper’s arguments I follow Michaelian, who does think that memory is episodic imagination of the past (cf. Michaelian 2016a: ch 6, especially section 10.).

<sup>12</sup> Again, to reply to a referee’s objection to this similarity in phenomenology, the key element here is “the past”. Remembering, according the simulationist, is episodically imagining *the past*. The referee correctly points out that Michaelian does include a metacognitive feeling of pastness in his analysis of remembering, but that does not change his view that remembering is a kind of imagination – imagination with a feeling of pastness.

other words, a continuity between episodic memory and episodic future thought and the differences between them are merely quantitative; this the doctrine of what Denis Perrin (2016) *continuism* about MTT.

Disjunctivism about remembering is *prima facie* at odds with these two observations of the simulationist. However, as Michaelian correctly points it out in the passage quoted above, we need to distinguish (a) the concept of memory and (b) the psychological process of remembering, and once we do it, it looks as though disjunctivism might be coherent as an approach to the former (though not to the latter). Indeed, Michaelian's main criticism against disjunctivism is pointed to someone who would champion it in connection to memory as a psychological process. But if the perception literature is our guide, then it is apparent that disjunctivists are not interested in psychology. Disjunctivism is not an empirical theory of perception, of how it works at the neural or at psychological level, etc.; it is rather an analysis of the concept of perceiving (seeing, hearing etc.).<sup>13</sup> This is not to say that it could not be informed by empirical data. In this sense, of course, Michaelian would be right to demand that, at a minimum, disjunctivism not be *incompatible* with empirical data. Yet, the onus is equally on the simulationist to make a case for the empirical data being *exhaustive* of what a proper theory, and hence, a proper concept of memory should be based on. As far as this essay is concerned, I will try to show, in the last section, that disjunctivism is *not* incompatible with any of the empirical data. At the same time, the simulationist hasn't yet provided any independent reason for the view that MTT is all there is to remembering.<sup>14</sup>

More recently, Sant'Anna and Michaelian (2019) put forward a further argument against going disjunctivist, which we might call 'the argument from size', namely, that given how easy it is to induce false memories and the fact that memories are never absolutely true to the facts, the size of the non-veridical disjunct will turn out to be massively larger than the size of 'successful memories'; in extremis, depending on how one interprets the argument from illusion (misremembering) and hallucination (confabulation), the set of successful memories will turn out to be null.

This is, roughly, the RADCON's case against going disjunctivist about memory. Note that if this argument from unity and continuity of MTT across the past/future divide and across the veridicality/non-veridicality divide works against direct realism and its disjunctive analysis of memory, then it will also work against causal theories of remembering since the core idea of the latter is, just like with direct realism, that there is a fundamental distinction both between past and future (not surprisingly since causation only occurs from past to future) and between remembering the past and merely imagining it (since in the latter case there is no causal connection to the past episode); the difference between the causal and the direct realist view comes with the different

<sup>13</sup> Michaelian is not alone in this misinterpretation of what disjunctivism is about. In the perception literature, Howard Robinson (1985: 173–177) commits the same error when advertising an argument against disjunctivism based on empirical discoveries about the proximate neural cause of one's experience, namely, the discovery that this cause is common to perception and hallucination. Similarly, Tyler Burge (2005) appeals to empirical facts about vision in order to reject disjunctivism.

<sup>14</sup> It is worth noting that the causal theory fares better on this count since it (correctly) classifies non-veridical "memories" as non-memories, because they lack the right causal connection to the represented event. In other words, the causal theory is similar, as far as this point is concerned, to direct realism (and hence disjunctivism); the difference lies in the latter requiring a constitutive relation rather than (only) a causal one to account for the veridicality, and hence for the nature of memory qua memory.



relations that are put forward to explain the above fundamental difference – a causal relation for causal theories versus a constitutive relation for direct realism.<sup>15</sup> Hence, it should not come as a surprise that RADCON is, in effect, an acausal or postcausal view.

### 3 The Case against RADCON

I do not deny that there is such a unity to MTT. But I do deny that from such a unity alone there is a valid inference to the view that episodic memory is nothing but MTT.

I want to point out two instances of serious incoherence in Michaelian's view as cashed out in his 2016 book, where his view of memory as MTT is expounded in most detail.

One such incoherence has to do with Michaelian's ultimate indecision as to whether MTT alone is sufficient for memory, or rather one also needs an extraneous condition of *factivity*. First, he rejects factivity as a necessary condition for remembering:

'[...] the factivity condition has no place in the naturalistic project of describing memory as a psychologically real process (...). Hence, while factivity is undoubtedly part of our commonsense conception of remembering, it will not be discussed further here. Since factivity is entirely an external, relational matter, however, we can reincorporate it into the account of remembering at any point. Those not convinced by the foregoing considerations are thus free to insist on factivity, though they should bear in mind that the resulting concept of remembering will not correspond to a real cognitive process—a natural kind.' (Michaelian 2016a: 69–70)

Later, when discussing Debus' (2014) argument for a distinction in kind between memory and imagination, based on the idea that the contents of memory are particular, namely, about particular events or objects experienced in the past, whereas those of episodic imagination cannot be so, he reinforces the point:

Debus's argument is similarly vulnerable to the reasons given above for rejecting the view that factivity is a necessary condition on remembering. The view

<sup>15</sup> An anonymous referee has raised doubts about whether the causal theory of memory would be affected by the constructivist argument from unity and continuity, stating that the causal theory might be taken as analogous to representationalism in the literature on perception. This second claim –viz. that the right perceptual analog of the causal theory of memory is representationalism/intentionalism—is not correct. The right analog is the causal theory of perception, which was defended by H. P. Grice (1961) and P. F. Strawson (1979) several decades before any intentionalist theory of perception was formulated. The first claim –viz. that it is doubtful that the causal theory of memory is analogous to disjunctivism in positing a fundamental difference between remembering the past and imagining it—the referee does have a point even if the right analog is the causal theory of perception. There is disagreement in the perception literature about whether the disjunctive analysis is compatible with the causal theory; in other words, about whether the causal theory is an instance of the highest common factor view. Snowdon (1981), for instance, thinks they are incompatible, whereas Child (1992) argues that they are. I follow the original proponents of the causal theory of perception, Grice and Strawson, in taking the causation as *part of the concept of perception*. More to the point, a causalist definition of seeing, for instance, is: Necessarily, subject *S* sees object *o* if, and only if, *o* causes in *S* the state of affairs of it looking to *S* as if  $\varphi o$ .

discussed there concerned the alleged difference in kind between remembering the past and imagining the past, whereas Debus's view concerns the alleged difference in kind between remembering the past and imagining the future, but both theories introduce a distinction between kinds of states or processes that does not correspond to a psychologically real difference. (Michaelian 2016a: 116–117)

This would all be coherent, and it would entail what I said in the beginning about RADCON's commitments in connection with my example of my missing our departmental meeting.<sup>16</sup> However, when it comes to the official formulation of his simulationist view, Michaelian introduces an extraneous condition on remembering an episode *e*: *e* belongs to one's *personal past*:

The simulation theory says that *S* remembers an episode *e* just in case

- *S* now has a representation *R* of *e*
- *R* is produced by a properly functioning episodic construction system which aims to produce a representation of an episode belonging to *S*'s personal past. (Michaelian 2016a: 107)

Let me first make it clear that my problem is not with the point that the construction system *aims* to produce some representation of the past, but with the idea that, specifically, it aims to produce a representation of the *personal past*.<sup>17,18</sup> When it comes to the issue of what 'personal past' means, Michaelian does not offer more than an informal gloss on it, saying it is the idea that the subject was involved in the episode *e*. One might think that personal involvement means simply that the subject has

<sup>16</sup> To be clearer, Michaelian, especially in his 2016b and 2018, thinks of remembering as a psychological process of content generation, which then he subdivides into veridical and nonveridical, depending on whether it matches the past episodes to a sufficient degree. The simulationist conditions on veridical remembering are (a) reliability (that is, the property of a process to generate content that usually tracks the past episodes), and (b) accuracy (that is, a high enough degree of matching the details of the past episode. Both (a) and (b) are satisfied by my example in the opening paragraph of this essay: my imagining our departmental meetings is reliable since I have a vast experience with them, and it is, *ex hypothesi*, accurate.

<sup>17</sup> This is also a response to an anonymous referee who was wondering whether I am not uncharitable to Michaelian by stating that he is committed to the idea that a representation of the past is an episodic memory only when its content is part of the personal past. Indeed, after stating the definition quoted above, Michaelian keeps explicitly mentioning this point in his book.

<sup>18</sup> Another anonymous referee had similar doubts about whether Michaelian's formulation of the simulationist necessary and sufficient conditions, i.e. that there is merely a representation of the personal past rather than a veridical representation of it, really has the implication that I claim it has. Again, the problem is with the formula "*personal past*", which is notoriously problematic, as witnessed in the literature on personal identity, where the so-called psychological criterion of personal identity over time is formulated (by John Locke initially) as a memory criterion, that is, in terms of the later person's remembering the earlier person's past. The criterion involves circularity since the concept of remembering already presupposes that of personal identity (you can't remember someone else's past). In our context, this formula is problematic in that it is hard to see what else is gained by adding the adjective "personal" to "imagining the past" than a condition of veridicality. There is a big difference between saying "I am imagining the past" and "I am imagining *my* past". Adding "my" changes the situation from a mere representation of a past episode to a veridical representation of it; see also below for how Michaelian fails to offer an analysis of the phrase "personal" except what he takes to be an "intuitive" understanding as a past in which one was involved.

experienced *e*, but Michaelian thinks that having experienced *e* is *not* a necessary condition for remembering *e*:

Rather than defining the notion of the personal past in terms of experience, it therefore seems preferable to fall back on our intuitive sense of what it is for a subject to be involved in an event. A subject's personal past can then be viewed as an ordered sequence of episodes in which the subject was involved. (Michaelian 2016a: 107)

I admit I lack knowledge of 'an intuitive sense of what it is for a subject to be involved in an event'. More importantly, the idea of involvement in an event does seem to me as another, camouflaged way of stating the factivity condition, which Michealian was earlier keen on rejecting. It does appear as synonymous with 'something that happened to me', which, implies 'something that happened', that is, a fact.

We get further evidence of this incoherence when considering why one can't remember *even in the simulationist sense* someone else's biography. Here is a relevant quote from Michaelian:

(...) it is important to observe that the simulation theory does not suggest that one can episodically remember events that do not belong to one's personal past. While semantic memory may also have a constructive character, the simulation theory, in virtue of its reference to the episodic construction system, views episodic construction as a distinct cognitive process. It is thus consistent with the fact that I can episodically remember my own voyage from France to Turkey, while I can only semantically remember that my great-grandfather traveled from the Ottoman Empire to the United States. (Michaelian 2016a: 119)

It is true and very intuitive that one can't episodically remember someone else's biography, but it is not at all apparent *why not*, if one adopts simulationism, according to which remembering is simply mentally simulating the (personal past). My grandfather was a prisoner of war in WWII, who escaped and travelled, by foot, from Germany to Hungary. Suppose I can imagine this trip so well and in so much detail that it really feels as my own past. Is this the same as remembering that trip? It is not clear, as far as simulationism is concerned. It does appear as though I am deploying the episodic construction system, which aims at representing my past, because it really feels as *my* past. Now, if Michaelian claimed this can't be remembering because it is not really my past, then he would smuggle some form of factivity back into the analysis. It is thus not clear whether simulationism can keep itself pure, that is, unadulterated by realist elements.

One consequence of this incoherence is that I am not sure anymore whether Michaelian is a RADCON in the sense in which I described this view, namely, in a way that would imply my verdict about what the RADCON would say about the example in my opening paragraph. Anyhow, I can change the example slightly, in ways that seem compatible with Michaelian's weaker view, which involves, besides MTT, the extraneous condition of the memory system aiming at an episode in the subject's

personal past, where ‘personal’ is understood as ‘having the person involved in the episode’. Here are two such versions to replace my opening sentence ‘Yesterday I missed our departmental meeting’:

- (a) *The absent-minded presence*: Yesterday I was present at our departmental meeting, but my mind was constantly focused on what to wear for the commencement...
- (b) *The sleepy presence*: Yesterday I was half asleep for the whole time during our departmental meeting.<sup>19</sup> I could hear voices and see silhouettes of people, but nothing more ...

My guess is that these are compatible with an alleged intuitive notion of personal involvement in an episode; yet, the verdict is the same: according to the constructivist, when I imagine what Bill said, based on my rich experience of how these meetings unfold in general, and what I imagine matches approximately what Bill said, I am *remembering* what Bill said.<sup>20</sup>

To me this still appears outrageous, but that is not my point. My point is that Michaelian should decide how radical he wants to go. As it stands, the theory that states an extraneous condition in guise of the personal involvement condition is distinct from the theory according to which episodic memory is *nothing but* MTT.

The second incoherence is metaphilosophical. In the second quote about factivity that I have reproduced earlier, Michaelian says that “factivity is undoubtedly part of our commonsense conception of remembering”. Yet he also says that it should not be a necessary condition for what he pursues as his own naturalistic theory of it. This indicates that he wants to keep commonsense isolated from whatever science might say about the phenomenon. Later, however, he talks about a ‘radical reconceptualization’ (Michaelian 2016a: 98) that happened with respect to the notion of episodic memory and about us being by now ‘a long way from any philosophical theory that views episodic memory as a matter of simply preserving a connection to past experiences.’ Since in this particular case – i.e. the issue of whether we should fundamentally distinguish remembering from imagining – commonsense and philosophy have been in agreement (witness the five decades of domination of the causal theory), it is unclear what Michaelian’s view is about the philosophical intuitions about remembering. These intuitions – like in my example with the departmental meeting – are clearly against equating remembering with MTT. Now, of course, Michaelian might say that his ultimate agenda is to effect a radical change in the philosophy of memory, while leaving the so-called commonsense conception intact, but for that he needs convincing *philosophical* arguments and thought experiments. What we have so far is an appeal to

<sup>19</sup> Or, indeed, as Bill Wringe pointed out to me, *fully* asleep, for all we learn from Michaelian’s notion of “being involved in an episode”.

<sup>20</sup> Michaelian does distinguish cases of remembering from cases of MTT merely matching the past facts *accidentally* (2016a: 109), which he explains via a malfunctioning and hence unreliable memory system. But note that in my examples the system is not malfunctioning and it is reliable: observing Bill at departmental meeting over the years made it possible for me to use imagination as a reliable way of retrodicting what he must have said at the latest meeting, even though I was absent, absent-minded, or sleepy, etc. It is a classical example of pure imaginative construction or content generation with no anchor (such as causal) in the past facts.

some empirical findings in neuroscience and cognitive psychology, which won't convince the philosophers that there really is no deep, important difference between remembering the past and imagining it.

## 4 The Case for Disjunctivism

I admit that disjunctivism might not appear too palatable at first sight; at the same time, I don't think it appears less palatable than RADCON. Hence, even *prima facie*, it is not a bad candidate for a postcausal view of episodic memory and of the place of MTT in the economy of remembering. Moreover, I do think there are some good reasons to adopt it. In this final section, then, I would like to offer some arguments in defense of disjunctivism about the state of *seeming to remember*. There are three such arguments, which I will dub: (1) the argument from fundamentality, (2) the argument from approximate accuracy, and (3) the argument from time's arrow. Each of them addresses a different issue in connection with either direct realism or some of the criticism of it.

### 4.1 The Argument from Fundamentality

From the unity and temporal continuity of MTT it does not follow that it is fundamental, and that memory as well as episodic future thought are to be subsumed under it. In the perceptual case everyone, including the direct realist, agrees that there is a unity to appearances or seeming perceptions. Yet that in itself is not sufficient to establish that appearances are fundamental. Indeed, some disjunctivists (Snowdon 2005: 136, cf. Soteriou 2016) do not merely put forward the idea of a disjunctive analysis of looks, but they also state that the relation between seeing and hallucinating is hierarchical, the former being fundamental and the latter an offshoot of it. It is notoriously difficult to clearly define fundamentality and there are several distinct things one might mean by 'fundamental'. In the context of our discussion, I think two interpretations of 'fundamental' are feasible: one is fundamentality as explanatory priority in selectionist-evolutionary terms, and one is fundamentality as some kind of intrinsic metaphysical basicness. Let me turn to each.

Evolutionary considerations are about whether a certain trait was selected for. When it comes to comparing two traits, one could raise the question of which one was selected *for* and which one was merely selected as an offshoot of the selected-for trait (Sober 1984). This notion of fundamentality as evolutionary priority, though coherent, is notoriously speculative. We could come up with selectionist stories for both memory and MTT; both seem to be useful, adaptive, fitness-enhancing. I do not think, therefore, that the matter will be easily settled once and for all.

The second kind of fundamentality is what I call 'metaphysical basicness'. What I mean by this is a grounding relation that follows from the very nature or account of the entity or kind that the theory posits. In particular, when it comes to memory, direct realism posits the past episodes themselves as *constitutive* of the memory state, and thereby memory, by its very nature or account, is basic since for the past episodes themselves the question 'in virtue of what does episode *e* exist?' does not arise – it is a *brute fact* that episodes exist or happen. What I mean is not that there is no explanation why *e* happened (e.g. in terms of what

caused  $e$ ), but rather that *relative to the entity or kind under scrutiny* (in our case memory states), the question of why  $e$  occurred is not relevant. It is not the task of a theory of memory to explain why an event, which someone happens to remember, happened; from the point of view of the theory, it is a brute fact, a given. This givenness is then inherited by what theory is about (namely, memory states), if one adopts direct realism.<sup>21</sup>

Things are different with MTT. It does make sense to ask a question like ‘in virtue of what does MTT occur?’, because (a) MTT has grounds outside itself, such as various neural processes that give rise to it and ground it, and (b) MTT could map either onto a real event or onto an imaginary one. I am not saying that MTT is not basic *because* of this, but that, unlike remembering as envisaged under a direct realist heading, it does not wear its basicness on its sleeve. Hence, it does, indeed, make sense to further decompose, *prima facie* at least, MTT into a disjunction like ‘remembering or imagining’.

To see this even better, consider a case that would typically be used by a causal theorist of memory as intuition pumps to persuade the reader.

*Scenario A:* Jack is currently vividly recalling the colors of a beautiful rainbow that he saw yesterday in the morning sky.

*Scenario B:* Jill has just fallen off her horse and hit her head, and, as a result, she is undergoing a state subjectively indistinguishable from what Jack is undergoing in *Scenario A*.

What I have just posited is, in effect, that Jack and Jill are undergoing a shared MTT state with a certain content. The idea is that the MTT state they share is caused by different types of events, and the causal theorist will, of course, say that only Jack is in a memory state; the causal theorist, in effect, is asking the question “what explains the MTT state?”, and depending on whether it is the right cause, she will judge whether both Jack and Jill are remembering the rainbow. For my purposes, the key observation is that it makes perfect sense to ask such a question about MTT, as its ground or explanation is outside itself (in our story, in the experience of the rainbow for Jack and in the head trauma for Jill), intuitively. But it does not make sense to ask a similar question about a certain memory state understood in the direct realist fashion since the object of remembering (the rainbow, say, to keep to our example) literally is (constitutes) part of that state; the state has its ground within itself.

## 4.2 The Argument from Approximate Accuracy

This is rather a response to what I have earlier dubbed ‘the argument from size’, put forward by Sant’Anna and Michaelian (2019). The answer to their argument lies in their own formulation of it, namely, in the phrase ‘depending on how the argument from confabulation and misremembering is interpreted’:

<sup>21</sup> This was in essence Thomas Reid’s direct realist view about memory. Reid stated this idea of basicness in theological terms: “I think it appears, that memory is an original faculty, given us by the Author of our being, of which we can give no account, but that we are so made.” (Bennett 2017: 134).

[...] the size of the “unsuccessful memory” disjunct is far larger than traditional disjunctivists have taken it to be. Depending on how the argument from confabulation and misremembering is interpreted, in fact, it may even be virtually empty. Research on constructive memory suggests that, because all memories include details not derived from experience of the relevant events, they inevitably depart to some extent from experience and are thus to some extent false [...]. All memories, in other words, are to some extent *mismemories*. (2019: 195)

There is no reason why the disjunctivist couldn't take these facts about memory on board. It is a widely accepted view that memory has laxer accuracy conditions than, say, perception, where one deploys the classical idea of truth-conditions. It is not as though the disjunctivist is, somehow, committed to an extreme and unsupported view that no one actually held, to the effect that memory has strict truth-conditions. On the contrary, the disjunctivist can simply assume that memory has approximate accuracy in virtue of which it counts as ‘true’. For example, one can easily imagine contexts in which misremembering the particular color of John's t-shirt when he entered the office yesterday –say, blue instead of purple– does not make it a false memory.

Furthermore, it is also, in fact, doubtful that perception really has stricter truth-conditions than memory. My own direct realist view (Aranyosi 2020)<sup>22</sup> makes room for such approximate accuracy precisely because even in perception the required accuracy is not very strict: I can see something better or worse depending on distance, on illumination conditions, on the presence of media such as fog or smoke, etc.. Similarly, in memory I can remember episodes better or worse depending on distance or location in time (cf. childhood amnesia – the phenomenon of us not being able to remember anything that happened to us before the age of 2 and barely anything that happened before 5), on confounding episodes, on whether the episodes were traumatic, etc. Remembering with a high enough, though not perfect, accuracy will be classified as ‘true memory’ by anyone in this debate, including the direct realist disjunctivist.<sup>23</sup> Consequently, the argument from size appears to me as quite unfair to its target.

### 4.3 The Argument from time's Arrow

Continuists deny that there is an asymmetry between past- and future-directedness when it comes to MTT and want to derive a conclusion from it about the metaphysics of memory, namely, that memory is a kind of episodic imagination and nothing more. The problem with this view, as I already pointed out in 4.1, is that one can accept that neurally as well as psychologically and phenomenally there is no difference, and yet deny that this amounts to showing that memory is nothing but MTT. The argument I

<sup>22</sup> –Which is different from, e.g., Debus's (2008), in that I defend an interpretation of memory as a quasi-perceptual state, that is, I take the analogy with perception at face value and apply the direct realist recipe to memory.

<sup>23</sup> This is the reason why, in section 1, I said that the argument from hallucination in the perception literature is more relevant as an analog for similar problems in the theory of memory than the argument from illusion. Whereas, say, the visual appearance of a stick half-submerged in water as a bent stick is considered an illusion, therefore, a case of *misperception*, a memory of the same stick as having been perceived as straight is probably not considered to be a case of misremembering, as it is accurate enough for most purposes and in most contexts. This at least is my intuition. Nothing hinges on this, however, as far as this essay is concerned.

want to put forward here is that the deep ontic structure of our reality does not collaborate with such a view, and that it does collaborate with both the causal theory and the direct realist theory.

What I mean by ‘deep ontic structure’ of our reality are things like the nature and structure of space (relational versus substantial), the nature and structure of time (static versus dynamic, symmetric versus asymmetric in orientation), the nature and structure of particulars, universals, of change, of causation, etc. What I mean by ‘collaborating’ is this deep ontic structure fitting, being congenial to, or accommodating smoothly the structure promoted by a certain theory of memory.

Time appears to be asymmetric in our universe. The idea of temporal asymmetry has been expressed in various ways and by appeal to various metaphysical theories: There is an arrow of time from past to future; the past is closed whereas the future is open; the past is actual while the future not yet (or there are merely possible futures); thermodynamic processes are not time-reversible. Some of these claims, in turn, are supported not merely by metaphysical speculation but by empirical facts about our universe. The causal theory of remembering fares very well with respect to whether the world collaborates with it. The temporal asymmetry in remembering (anything that deserves to be called ‘remembering’ can exclusively be about the past, not also about the future) can be derived from the asymmetry of causation, and, as David Lewis (1979) argued, this asymmetry of causation is not an a priori matter, but simply a de facto (and contingent) feature of our universe.<sup>24</sup>

Similarly, a direct realist approach to remembering has the word on its side since future and merely imagined episodes do not exist, hence, they cannot, as a matter of fact, be *constituents* of any present mental state; recall that direct realism is also called ‘relationalism’, and the instantiation of a relation implies the existence of its relata. Consequently, the disjunctive view of MTT as <either remembering or imagining> is pretty much justified by, or grounded in, the de facto asymmetries in the deep ontic structure of our world.

\*\*\*

Though none of the foregoing considerations are intended as knock-down arguments, I hope they are reasonable enough to at least persuade the reader that direct realism and its disjunctivist commitments are not crazy and indefensible views when it comes to episodic memory, even in the context of recognizing MTT as the type of unitary and coherent process that is going on in our species’ cognitive system when we seem to remember. To summarize, what I have tried to establish are the following: that if direct realism about perception is a model for direct realism about memory, then disjunctivism has to be embraced, that disjunctivism is at least as plausible as simulationism, that simulationism (as elaborated my Michaelian) is itself unstable or incoherent when it comes to its commitment to reducing episodic memory to MTT and eliminating any trace of realism.

<sup>24</sup> Lewis uses an example of Karl Popper’s (1956) of a spherical wavefront expanding outwards from a point source – of the kind that forms, for example, when you throw a rock into a lake. Each point of the wave postdetermines what happened at the point at which the wave is emitted (e.g. that a rock has been thrown into the lake). This reverse process, which can be seen as a massive overdetermination of the source event, though not against the laws of nature, seldom happens in actual fact. Our universe is de facto asymmetric when it comes to causation: causes have a multitude of independent effects, but it seldom happens that a multitude of independent causes have the same effect. This asymmetry of causation, then, can be taken as grounding the asymmetry of time.



**Acknowledgements** I would like to thank people whose comments and criticism on this paper made me improve it considerably, especially two anonymous referees, Bill Wringe, Nick DiBella, Tufan Kıymaz audiences at Bilkent University and at Université Grenoble Alpes (where a few of these ideas were presented as part of another paper), and the editors of this special issue, Kourken Michaelian, André Sant’Anna, and Denis Perrin.

## References

- Addis, D.R., A.T. Wong, and D.L. Schacter. 2007. Remembering the past and imagining the future: Common and distinct neural substrates during event construction and elaboration. *Neuropsychologia* 45 (7): 1363–1377.
- Anscombe, G.E.M. 1965. The intentionality of sensation: A grammatical feature. In *Analytical philosophy: First series*, ed. R.J. Butler, 143–158. Oxford: Blackwell.
- Aranyosi, I., 2020. ‘Preterception: Memory as past-perception’, manuscript.
- Armstrong, D.M. 1968. *A materialist theory of the mind*. London: Routledge and Kegan Paul.
- Bennett, J. (ed.), 2017, Early modern texts. Thomas Reid, *Essays on the Intellectual Powers of Man*, <https://www.earlymoderntexts.com/assets/pdfs/reid1785essay3.pdf>
- Bernecker, S. 2008. *The metaphysics of memory*. Berlin: Springer.
- Burge, T. 2005. Disjunctivism and perceptual psychology. *Philosophical Topics* 33 (1): 1–78.
- Byrne, A. 2001. Intentionalism defended. *Philosophical Review* 110: 199–240.
- Byrne, A. 2009. Experience and content. *The Philosophical Quarterly* 59 (236): 429–451.
- Byrne, A. and H. Logue, 2008, ‘Either/or’. In A. Haddock and F. Macpherson (eds.) *Disjunctivism: Perception, Action, Knowledge*, Oxford: Oxford University Press, 57–94.
- Campbell, J. 2002. *Reference and consciousness*. Oxford: Oxford University Press.
- Child, W. 1994. *Causality, interpretation, and the mind*. Oxford: Clarendon Press.
- Crane, T. 2006. Is there a perceptual relation? In *Perceptual Experience*, ed. T. Gendler Szabó and J. Hawthorne, 126–146. Oxford: Oxford University Press.
- Debus, D., 2008, ‘Experiencing the past: A relational account of recollective memory’, *dialectica* 62 (4): 405–432.
- Debus, D. 2014. “Mental time travel”: Remembering the past, imagining the future, and the particularity of events. *Review of Philosophy and Psychology* 5 (3): 333–350.
- Dokic, J. 2001. ‘Is memory purely preservative?’. In C. Hoerl and McCormack, T. (eds.) *Time and Memory*, Oxford: Oxford University Press, 213–232.
- Fernandez, J. 2018. The functional character of memory. In *New directions in the philosophy of memory*, ed. K. Michaelian, D. Debus, and D. Perrin. New York: Routledge.
- Grice H. P., 1961, ‘The causal theory of perception’, *Proceedings of the Aristotelian Society*, Supp. Vol. xxxv: 121–53.
- Hinton, J.M. 1973. *Experiences*. Oxford: Clarendon Press.
- Lackey, J. 2005. Memory as a generative epistemic source. *Philosophy and Phenomenological Research* 70: 636–658.
- Lewis, D. 1979. Counterfactual dependence and time’s arrow. *Noûs* 13: 455–476.
- Martin, C.B., and M. Deutscher. 1966. Remembering. *Philosophical Review* 75: 161–196.
- Martin, M.G.F. 1997. The reality of appearances. In *Thought and Ontology*, ed. M. Sainsbury, 81–106. Milan: FrancoAngeli.
- Martin, M.G.F. 2002. The transparency of experience. *Mind and Language* 17: 376–425.
- Martin, M.G.F. 2004. The limits of self-awareness. *Philosophical Studies* 120: 37–89.
- Martin, M.G.F. 2006. On being alienated. In *Perceptual Experience*, ed. Tamar S. Gendler and John Hawthorne, 354–410. Oxford: Oxford University Press.
- Matthen, M. 2010. Is memory preservation? *Philosophical Studies* 148: 3–14.
- McDowell, J. 1982. Criteria, defeasibility and knowledge. *Proceedings of the British Academy* 68: 455–479.
- McDowell, J., 1986, ‘Singular thought and the extent of inner space,’ in Philip Pettit and John McDowell (eds.), *Subject, Thought and Context*, Oxford: Clarendon Press.
- Michaelian, K. 2011. Generative memory. *Philosophical Psychology* 24 (3): 323–342.
- Michaelian, K. 2016a. *Mental time travel. Episodic memory and our knowledge of the personal past*. Cambridge: MIT Press.

- Michaelian, K. 2016b. Confabulating, misremembering, relearning: The simulation theory of memory and unsuccessful remembering. *Frontiers in Psychology* 7: 1857.
- Michaelian K. and S. Robins, 2018, 'Beyond the causal theory? Fifty years after Martin and Deutscher', in K. Michaelian, D. Debus & D. Perrin (eds.), *New Directions in the Philosophy of Memory*. Routledge. pp. 13–32.
- Michaelian K. 2018, 'Confabulating as unreliable imagining: In defence of the simulationist account of unsuccessful remembering.' *Topoi*. Online ahead of print. Special issue: *Philosophical perspectives on confabulation*. S. Stammers and L. Bortolotti (Eds.) DOI: <https://doi.org/10.1007/s11245-018-9591-z>, 133, 148.
- Nanay, B. 2016. Philosophy of perception: A road map with lots of bypass roads. In *Current controversies in philosophy of perception*, ed. B. Nanay. London: Routledge.
- Nudds, M. 2009. Recent work in perception: naïve realism and its opponents. *Analysis* 69: 334–346.
- Perrin, D., 2016, 'Asymmetries in subjective time', in Michaelian, Klein, & Szpunar 2016d: 39–61.
- Popper, K. 1956. The arrow of time. *Nature* 1777: 538.
- Robinson, H. 1985. The general form of the argument for Berkleian idealism. In *Essays on Berkeley: A tercentennial Celebration*, ed. J. Foster and H. Robinson. Oxford: Clarendon Press.
- Robinson, H. 1994. *Perception*. New York: Routledge.
- Russell, B. 1948. *Human knowledge: Its scope and limits*. London: Allen & Unwin.
- Sant'Anna, A., and K. Michaelian. 2019. Thinking about events: A pragmatic account of the objects of episodic hypothetical thought. *Review of Philosophy and Psychology* 10: 187–217.
- Smith, A.D. 2010. Disjunctivism and illusion. *Philosophy and Phenomenological Research* 80 (2): 384–410.
- Snowdon, P.F. 1981. Perception, vision, and causation. *Proceedings of the Aristotelian Society* 81: 175–192.
- Snowdon, P.F. 1990. The objects of perceptual experience. *Proceedings of the Aristotelian Society Supplementary Volumes* 64: 121–150.
- Snowdon, P.F. 2005. The formulation of disjunctivism: A response to fish. *Proceedings of the Aristotelian Society* 105: 129–141.
- Snowdon, P.F. 2008. 'Hinton and the origins of disjunctivism', in Haddock and Macpherson (eds.) *Disjunctivism: Perception, Action, Knowledge*. Oxford: Oxford University Press 35–56.
- Sober, E. 1984. *The nature of selection*. Cambridge: Bradford Books/MIT Press.
- Soteriou, M., 2016, 'The disjunctive theory of perception', *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.) URL = <<https://plato.stanford.edu/archives/win2016/entries/perception-disjunctive/>>.
- Strawson P.F., 1979, 'Perception and its objects', in Macdonald G.F. (ed.) *Perception and Identity*, London: Palgrave.
- Szpunar, K.K., J.M. Watson, and K.B. McDermott. 2007. Neural substrates of envisioning the future. *Proceedings of the National Academy of Sciences of the United States of America* 104 (2): 642–647.
- Tulving, E. 1985. Memory and consciousness. *Canadian Psychology* 26 (1): 1–12.
- Tulving, E., 2011, 'Origin of auto-noesis in episodic memory'. In H. L. Roediger et al (eds.) *The nature of remembering: Essays in honor of Robert G. Crowder*, Washington, DC: American Psychological Association, 17–34.
- Tye, M. 1984. The adverbial theory of visual experience. *Philosophical Review* 93: 195–225.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.