

4 If Remembering Is Imagining, Then What Is Forgetting?

Kourken Michaelian

1 Introduction: Simulationism and Forgetting

The relationship between remembering and imagining is at the heart of recent debates in the philosophy of memory. In contrast to the *causal theory of memory* (CTM; Martin and Deutscher 1966; Bernecker 2010), which holds that remembering requires an appropriate causal connection to a currently represented event and thus suggests that remembering and imagining are deeply discontinuous (Perrin 2016; Robins 2020a), the *simulation theory of memory* (Michaelian 2016c, forthcoming-a) sees remembering and imagining as fundamentally continuous (Michaelian 2016a). Indeed, memory is, according to simulationism, a form of imagination and thus no more requires a causal connection to the represented event than does any other form of imagination.¹

In slogan form, the simulation theory says that to remember is to imagine the personal past. More precisely, it says that a subject, *S*, remembers just in case he or she satisfies both a *current representation* condition and a *proper function* condition:

- (STM) *S* remembers an event, *e*, if and only if
- (CR) *S* now represents *e*;
- (PF) *S*'s current representation of *e* is produced by a properly functioning and hence reliable episodic construction system that aims to produce a representation of an event belonging to *S*'s personal past.

CR is straightforward and accepted by both causalists and simulationists.² PF requires some unpacking.

Inspired by empirical research on memory as a form of mental time travel (see Perrin and Michaelian 2017; Addis 2020), simulationism takes episodic memory and episodic future thought – the form of imagination dedicated to future events – to be underwritten by a common neurocognitive system. The system in question – the episodic construction system – is designed to produce representations of past and future events on the basis of stored information deriving from the subject's experiences. In the case

DOI: 10.4324/9781003153429-6

of future thought, it is impossible for the system to make use of stored information deriving from the subject's experience of the represented event, in particular, simply because the subject has not (yet) experienced that event; instead, it relies on information deriving from his or her experiences of other events. Simulationists infer that, in the case of memory, the system likewise need not make use of information deriving from the subject's experience of the represented event. In some cases, it presumably does so; in others, it does not, instead relying exclusively on information deriving from his or her experiences of other events.

Simulationism thus rejects the causal theory's *appropriate causation* condition. Whereas CTM takes genuine remembering to be distinguished from merely apparent remembering by the presence of an appropriate causal connection – a connection sustained by a memory trace laid down by the subject's experience of the remembered event, stored between the time of encoding and the time of retrieval, and providing at least some of the content³ of the retrieved representation – STM takes genuine remembering to be distinguished from merely apparent remembering by the reliability of the simulation process that produces the “retrieved” representation: if that process is reliable, the subject remembers; if it is not, he or she does not remember but rather confabulates (Michaelian 2016b, 2020, forthcoming-b).⁴ The simulationist is thus committed to the following “no content” claim.

(NO-C) A genuine memory need not include any content originating in the subject's experience of the remembered event.

Simulationism takes healthy future thought to be likewise distinguished from future-oriented confabulation by its reliability and thus holds that remembering is ultimately distinguished from future thinking merely by its target: whereas future thinking aims to produce a representation of an event belonging to the personal future, remembering aims to produce a representation of an event belonging to the personal past.

Because simulationism does not require, for the occurrence of genuine remembering, that the retrieved memory include any content deriving from the subject's experience of the remembered event, there is no apparent reason for the simulation theory to include a *previous experience* condition – a condition requiring that the represented event have been experienced by the subject when it occurred – of the sort included by the causal theory. STM thus also departs from CTM in not including such a condition. The formulation of PF included in STM does, however, presuppose that the remembered event is part of the subject's *personal past*. Thus, if there are events that constitute part of a given subject's personal past despite not having been experienced by that subject – and there is reason to take the possibility that there are such events seriously (Michaelian 2016c; McCarroll 2020) – the simulationist is committed to the following “no experience” claim.

(NO-E) A genuine memory need not be of an event that the subject experienced.

Both NO-C and NO-E are counterintuitive, and both claims play important roles in McCarroll's (2020) critique of simulationism.⁵

Seeking to defend causalism's "diachronic" approach, an approach that treats remembering as a process running from the moment of experience to the moment of retrieval, against simulationism's "synchronic" approach, an approach that, in effect, reduces remembering to the retrieval process (Michaelian and Robins 2018), McCarroll argues that, because it endorses NO-C, simulationism is unable to account for forgetting. In so arguing, McCarroll might mean to make any of several distinct claims. He might mean to claim that the theory is unable to say *what* forgetting is. He might mean to claim that it is unable to say *why* forgetting occurs (when it does occur). Or he might mean to claim that it is unable to say why forgetting occurs *as often* as it does. McCarroll takes the causal theory, in contrast, which posits "a causal connection to one's past, a memory trace, which can, through age, injury, or neglect, be disrupted or destroyed", to provide a straightforward account of forgetting (2020, 5). Moreover, while he acknowledges that simulationism recognizes that remembering involves traces, he maintains that, because simulationism implies NO-C, the simulationist is unable simply to avail himself of the causalist account.

Responding to McCarroll's argument, this chapter demonstrates that something very much like the causalist account of forgetting is in fact available to simulationism (Section 2) and that the simulationist is thus able to explain what forgetting is (Section 3), why it occurs (Section 4), and why it occurs as often as it does (Section 5). Forgetting thus poses no special problem for the simulation theory.

In addition to arguing that, because it endorses NO-C, simulationism is unable to account for forgetting, McCarroll argues that, because it endorses NO-E, simulationism is unable to account for infantile amnesia (Section 6). Considerations of length require that responding to this argument be left as a task for another occasion.

2 Retrieval Vagueness

McCarroll's reason for maintaining that, because simulationism implies NO-C, the simulationist is unable simply to avail himself of the causalist account concerns what he refers to as "retrieval vagueness", contrasting it with "trace vagueness":

One of the simulationist motivations to move away from the causal theory was because of its inherent vagueness about the similarity required between the content of the past experience and the content of the present memory. Let us call this "trace vagueness". But if the simulation theorist embraces the notion of traces to explain forgetting,

then the problem of vagueness enters at the other extreme, at the point of retrieval. One of the most striking claims of the simulation theory is that memory need not draw on any information originating in the original event. But if we want to acknowledge that forgetting routinely occurs, how many cases of genuine remembering will involve no content originating in the original event? The simulationist answer to this is not clear. Let us call this “retrieval vagueness”.

(2020, 5)

In a nutshell, the retrieval vagueness problem for the simulation theory arises – or is supposed to arise – because the simulationist claims both that remembering sometimes draws on a trace deriving from the experience of the represented event and that it sometimes does not do so.

Let us briefly review the simulationist’s claims concerning the trace vagueness problem for the causal theory. In order to accommodate the empirical evidence for the constructive character of remembering, the simulationist argues, the causalist must allow that not all of the content of a retrieved representation need, if that representation is to qualify as a genuine memory, originate in the subject’s experience of the represented event. He must, that is, allow that it is compatible with genuine remembering that some of the content originates elsewhere (e.g., in the subject’s experiences of other events or in the testimony of other subjects); all that is required is that *enough* of the content originate in that experience. But this “constructive causal theory” (Michaelian 2011a; McCarroll 2018; Sutton and O’Brien forthcoming) leaves unclear just *how much* of the content of the retrieved representation needs to originate in the subject’s experience of the represented event, and the fact that there is no apparent way of specifying a nonarbitrary cut-off point between all of the content’s originating in the experience and none of the content’s originating in the experience motivates a move from causalism’s diachronic approach to simulationism’s synchronic approach: if we can rule out the assumption that *all* of the content must originate in the experience, and if there is no reason to suppose that *any particular fraction* of the content must originate in the experience, we seem to be led inexorably to the conclusion that – as simulationism would have it – there is no requirement that *any* of the content must originate in the experience (Michaelian 2016c).

There is no need, for the sake of an assessment of McCarroll’s reasoning, to take a stand on whether the simulationist is right in arguing that the vagueness inherent in the constructive causal theory motivates a move to the simulation theory. What matters is whether the simulation theory is itself subject to an analogous sort of vagueness. In McCarroll’s view, it is, for the theory suggests that remembering draws on content deriving from experience of the represented event in some but not all cases. Given that there is no apparent way for the simulationist to specify just *how many* cases of remembering draw on such content, the simulation theory would seem

to be just as inherently vague as the causal theory: just as there is no reason for the causal theorist to suppose that any particular fraction of the content of a given memory must originate in experience, there is no reason for the simulation theorist to suppose that any particular fraction of our memories includes content deriving from experience of the represented events.

While initially plausible, this reasoning is ultimately unconvincing. There may be a similarity between how simulationism stands with respect to the fraction of our memories that include content deriving from experience of the represented events and how causalism stands with respect to the fraction of the content of a given memory that must originate in experience, but the similarity is merely superficial, for the vagueness to which McCarroll points pertains not to the simulation theory *itself* but, rather, to difficulties that arise if we attempt to *apply* the theory in certain ways. The simulation theory, in other words, is not itself vague.⁶ Simulationism is an account of the nature of remembering. As such, it is under no obligation to tell us how many cases of apparent remembering are cases of genuine remembering. Nor is it under any obligation to tell us how many cases of genuine remembering draw on content deriving from experience of the represented event. Empirical investigation would be required to answer both of these questions. The necessary investigation may be difficult or even practically impossible to carry out, but that is no fault of the simulation theory.

To see this, note that the causal theory faces a strictly analogous “problem”. Whereas the problem for the simulation theory concerns the distinction, within the category of *genuine* memory, between memories that draw on content deriving from experience of the represented event and memories that do not, the problem for the causal theory concerns the distinction, within the category of *apparent* memory, between genuine memories and merely apparent memories. According to the causal theory, what makes the difference between a genuine and a merely apparent memory is the involvement, in the subject’s current representation, of content deriving from the subject’s experience of the represented event. The causal theory does not tell us how many cases of apparent remembering involve such content. It therefore involves precisely the same form of retrieval vagueness as does the simulation theory. Now, the causal theorist will rightly point out that his or her theory is an account of the nature of genuine remembering, that, as such, it is under no obligation to tell us how many cases of apparent remembering are cases of genuine remembering and that it is therefore under no obligation to tell us how many cases of genuine remembering involve content deriving from the subject’s experience of the represented event. Empirical investigation – the same difficult and perhaps impossible empirical investigation that would be required if simulationism were right – would be required to answer this question. But there is no inherent vagueness here, merely practical limits on our ability to determine the frequency with which content is transmitted from past to present.

The vagueness to which the simulationist points, in contrast, is inherent in the constructive causal theory itself. A simple analogy will serve to illustrate the

difference between the trace vagueness problem for the causal theory and the retrieval vagueness problem for the simulation theory (and for the causal theory). Consider two theories of dessert. According to the first theory, a genuine dessert must include some sugar – what makes the difference between a genuine dessert and a merely apparent dessert is the inclusion of enough sugar. According to the second, a dessert need not include any sugar – though some and perhaps most desserts include sugar, all that is required for desserthood is the inclusion of a sweetener of some sort. The sugar theory is, of course, analogous to the constructive causal theory and the sweetener theory to the simulation theory. The analogue of the retrieval vagueness problem, which arises for both the sugar theory and the sweetener theory, says that the theory in question is vague because it does not tell us how many (apparent) desserts include sugar. The right way of responding to this problem, regardless of which theory one endorses, is by pointing out that it is not really a problem: neither theory tells us how many (apparent) desserts include sugar, but neither is meant to do so. It may or may not be empirically feasible to determine how many (apparent) desserts include sugar, but, should it turn out not to be feasible, that would not imply that either theory is wrong about the nature of dessert. The analogue of the trace vagueness problem, which arises for the sugar theory but not for the sweetener theory, says that the theory is vague because it does not tell us how much sugar is sufficient for desserthood. Even if we disregard empirical limitations, the theory thus fails to provide us with a criterion that can be applied in order to determine whether a given apparent dessert is a genuine dessert. The sweetener theory, in contrast, does provide us with such a criterion.⁷

Moving from the analogy back to the theories of memory with which we are concerned, the conclusion to which we are entitled to come is that, as far as vagueness is concerned, simulationism is in good shape. The retrieval vagueness problem may thus be set aside.

3 Defining Forgetting

In arguing that simulationism is unable to account for forgetting, McCarroll might, again, mean to make any of several distinct claims. He might mean to claim that the theory is unable to say what forgetting is. He might mean to claim that it is unable to say why forgetting occurs (when it does occur). Or he might mean to claim that it is unable to say why forgetting occurs as often as it does. The present section considers the first of these claims; Sections 4 and 5 consider the remaining two.

In places, McCarroll seems to suggest that simulationism is unable to say what forgetting is—that is, it is unable to provide a *definition* of forgetting. He argues, for example, that, if we accept the distinction between “forgetting in the sense of the permanent elimination of a memory trace (the unavailability of a record) and forgetting in the sense of the (possibly temporary) inaccessibility of a trace” (Michaelian 2011b, 403), then “forgetting seems to involve the absence of stored content, not being able to retrieve, for whatever reason,

some information in the form of a memory trace” (2020, 4), suggesting that, in rejecting the causalist vision of the role played by traces in remembering, simulationism renders itself unable to offer an adequate definition of forgetting. The distinction in question is, however, best understood as pertaining not to the definition of forgetting but rather to the *mechanisms* responsible for forgetting, and there is, in principle, nothing to prevent the simulationist from providing a definition of forgetting. Indeed, there is nothing to prevent him from agreeing with the causalist on such a definition (even while disagreeing with him about the mechanisms responsible for forgetting).

The possibility of agreement between causalists and simulationists may be obscured by the fact that few serious attempts to define forgetting have been made by either camp. But let us consider, for the sake of illustration, a simple analysis in the spirit of that proposed by Frise (2018). According to the analysis,

- S forgets e if and only if
- S could previously access e ;
- S fails to access e ;
- S intends to access e , or e is inaccessible to S .

An analysis along these lines can, in principle, be accepted both by causalists and by simulationists, with each camp employing a different notion of *access*. Causalists will understand access literally, in terms of the retrieval of memory traces: for S to access e is for S to retrieve a stored memory trace of e . Simulationists will understand it more loosely, in terms of simulation: for S to access e is for S to simulate e (where simulating e might or might not involve retrieving a trace of e). Understood in simulationist terms, then, the Frisian analysis says that S forgets e if and only if S could previously simulate e , S fails to simulate e , and either S intends to simulate e or S is unable to simulate e .

While other analyses of forgetting can certainly be formulated (see Frise 2018), this suffices to establish that simulationists can provide a definition of forgetting and that simulationists and causalists can – disregarding the different notions of access that they employ – agree on a definition. The difference between the two camps emerges not with respect to the *definition* of forgetting but rather with respect to the *mechanisms* responsible for forgetting: failure or inability to retrieve a memory trace originating in the relevant event vs. failure or inability to simulate that event. We may therefore turn from the claim that simulationism is unable to say what forgetting is to the claim that it is unable to say why forgetting occurs.

4 Mechanisms of Forgetting

Given that McCarroll takes forgetting not to pose a problem for the causal theory, he presumably takes what the causal theory has to say about the

mechanisms responsible for forgetting to be adequate. The causalist may be able to tell more than one story about why forgetting occurs, but the obvious story is straightforward: at one point in time, the subject is able to retrieve a trace deriving from his or her experience of the relevant event; at a later point in time, the subject is no longer able to do so, either because he or she no longer has the trace (unavailability) or because he or she has it but is, for some reason (e.g., the absence of a suitable cue) unable to access it (inaccessibility). This story, of course, does not amount to a particularly detailed description of a mechanism, but CTM – which, as becomes a philosophical theory, is pitched at a high level of generality – will not, by itself, get us much further than this, and a more detailed description will, of necessity, be grounded in empirical research on the conditions under which traces tend to become unavailable or inaccessible. The causalist thus cannot legitimately demand of the simulationist that he or she provide a highly detailed story about why forgetting occurs; a general description of the mechanism responsible for the phenomenon will have to be enough.

The obvious simulationist story about why forgetting occurs is just as straightforward as the causalist story: at one point in time, the subject is able to simulate the relevant event; at another point in time, the subject is no longer able to do so, either because his or her episodic construction system no longer has suitable raw materials available (i.e., raw materials sufficient to enable him or her to simulate the event) or because it has suitable raw materials available but is no longer able to access (i.e., retrieve) them (cf. Caravà 2021). Now, to say that a subject's episodic construction system does not have available or is unable to access suitable raw materials is just to say, at least in part, that it does not have available or is unable to access suitable traces. Simulationism, in other words, can avail itself of something very much like the causalist explanation of forgetting. Memories of past events do not arise *ex nihilo* any more than do imaginations of future events, and, if the episodic construction system does not have available or is unable to access suitable traces, regardless of the experiences from which those traces derive, it may be unable to simulate a given event, regardless of whether that event is situated in the future or in the past. Forgetting may thus occur because the subject, at one point in time, has and is able to access traces sufficient to enable him or her to simulate the relevant event and, at a later point in time, no longer has such traces or has them but is unable to access them. The difference between the simulationist story and the causalist story is simply that the latter assumes (while the former does not) that the traces in question derive from the subject's experience of the event. Regardless of which of these stories is adopted, an account of the conditions under which traces tend to become unavailable or inaccessible will require empirical research.

At first glance, the simulationist story just outlined might appear to be incompatible with STM. But it is important to note that the simulation theory does not deny that remembering draws on traces but only that a

memory of a given event must draw on a trace deriving from the subject's experience of that event. The story is thus compatible with the theory. It is equally important to note that, while the simulation theory denies that a memory of a given event must draw on a trace deriving from the subject's experience of that event, it does not maintain that there is no case in which it does so. In other words, simulation, as it is understood by simulationism, may sometimes involve access, as access is understood by causalism, even if it typically involves more than mere access. Indeed, accessing (i.e., retrieving) a trace deriving from an experience of an event may, in some cases, be the only feasible way of producing an accurate representation of that event. The "causalist" mechanism described earlier – at one point in time, the subject has and is able to access a trace deriving from his experience of the relevant event; at a later point in time, the subject no longer has that trace or has it but is unable to access it – can thus be seen as a special case of the "simulationist" mechanism.

Simulationism, then, would seem to fare at least as well as causalism with respect to the question of the mechanism responsible for forgetting. McCarroll, however, argues that any account of forgetting that invokes traces is off-limits to simulationism, not only because invoking traces leads to the problem of retrieval vagueness – which, as we have already seen, is not really a problem – but also due to its synchronic character:

The causal theory sees memory as a *diachronic* capacity, where the relation between two representations at different temporal points is important. The simulation theory views memory as a *synchronic* process, in which the context of retrieval is emphasized as the point of content generation. The notion of forgetting seems to presuppose that memory is a diachronic capacity. Therefore, the simulationist cannot explain forgetting by appealing to traces, because even if one may have forgotten some past event through the decay or absence of a trace, according to the simulationist one can still construct a genuine memory representation in the present based on other sources of information (e.g., testimony). [...] Any appeal to traces to explain forgetting is to forget the consequences of the simulationist's synchronic understanding of the generation of episodic memory content.

(2020, 5)

McCarroll's reasoning here is fairly condensed but appears to rely on two assumptions: first, that, if forgetting is a diachronic notion, then remembering must likewise be a diachronic notion; second, that, because the simulationist understands remembering in synchronic terms, any explanation that he or she gives of why remembering does or does not occur – the nonoccurrence of remembering including forgetting – must itself be synchronic. Both assumptions are plausible, but both turn out, on closer inspection, to be incorrect.

Consider the first assumption, according to which, if one adopts a diachronic notion of forgetting, then one must also adopt a diachronic notion of remembering. Forgetting itself is uncontroversially a diachronic notion: since one cannot forget what one could not previously remember, the notion of forgetting necessarily refers to more than one time – *S* cannot forget *e* at a given time unless he or she was able to remember *e* at an earlier time. But this does not entail that remembering is likewise a diachronic notion, for whether *S* is remembering *e* at a given time might still be determined entirely by what *S*'s episodic construction system is doing at that time. To see this, consider a notion that is otherwise analogous to forgetting but that pertains to imagination rather than memory. *S* cannot, let us stipulate, “i-forget” *e* at a given time unless he or she was able to imagine *e* at an earlier time. I-forgetting, like forgetting, is a diachronic notion. But employing this notion does not require one to adopt a diachronic notion of imagining: whether *S* is imagining *e* at a given time might still be determined entirely by what *S*'s episodic construction system is doing at that time. It might be determined, for example, by whether *S*'s episodic construction system is functioning properly and drawing on the raw materials available to it to generate a representation of *e*. For the simulationist, of course, (mnemonic) forgetting is just a form of i-forgetting. But he or she remains free to employ his or her synchronic notion of remembering: whether *S* is remembering *e* at a given time, he or she can coherently maintain, is determined by whether *S*'s episodic construction system is functioning properly and drawing on the raw materials available to it to generate a representation of *e*, where *e* is an event from *S*'s personal past. Causalist will, naturally, reject both the simulationist's understanding of mnemonic forgetting as a form of i-forgetting and his or her understanding of remembering as a form of imagining, but the point about the compatibility of the two notions stands: adopting a diachronic notion of forgetting does not require one to adopt a diachronic notion of remembering.

Consider, then, the second assumption, according to which, if one understands remembering in synchronic terms, then any explanation that one gives of why remembering does or does not occur must itself be synchronic. The assumption runs two things together. On the one hand, there is the matter of the factor in virtue of which a given instance of apparent remembering *qualifies as* an instance of genuine remembering. According to the simulation theory, this factor is synchronic, in that the theory implies that whether an apparent memory qualifies as a genuine memory depends only on whether the subject's episodic construction system functions properly at the time at which it produces the apparent memory. On the other hand, there is the matter of the factor in virtue of which a given instance of (genuine) remembering *occurs*. According to the simulation theory, this factor need not be synchronic, in that the theory does not imply that whether a subject's episodic construction system produces a given

representation at a given time depends only on what happens at that time. There is nothing in the theory that prevents the simulationist from invoking occurrences at earlier times in accounting for the production of a representation by the episodic construction system at a later time: in all or most cases, as we have seen, the encoding and storage of traces will figure among the occurrences invoked by the simulationist; in some cases, the encoding and storage of a trace deriving from the subject's experience of the represented event will figure among those occurrences.

The upshot is that understanding forgetting in diachronic terms while employing a synchronic conception of remembering does not involve the simulationist in any inconsistency. Nor does employing a synchronic conception of remembering while accounting for the occurrence or nonoccurrence of particular cases of remembering in diachronic terms, including in terms of memory traces. In short, there is, contra McCarroll, nothing that bars the simulationist from providing "an explanation of forgetting that relies on traces" (2020, 5). We may therefore turn from the claim that simulationism is unable to say why forgetting occurs to the claim that it is unable to say why forgetting occurs as often as it does.

5 The Extent of Forgetting

This claim seems to be what McCarroll has in mind when he argues that

if remembering is simply imagining an event in one's personal past, then as long as one has access to information about that past event (e.g., from photographs or third-person testimony) one could, in principle, *always* remember one's past. [...] [I]f the subject potentially always has access to the information necessary for the construction of a simulation of a past event, then barring a total failure of a properly functioning episodic construction system, the subject could *always* succeed in producing a representation of the past event. There is *potentially* no forgetting if remembering is merely (reliably) imagining. But this is a highly counterintuitive consequence of the simulation theory.

(2020, 4–5; emphasis in the original)

The details of McCarroll's reasoning here are less explicit than one might like, but its gist begins to become clear when he remarks that, if, as the simulation theory permits,

a memory can be constructed exclusively from a source of information in the present, when we have access to all the necessary information and are attending to it, then there is no way for the mechanisms of forgetting to occur.

(2020, 5)

The idea here seems to be the following. If the simulation theory is right, then – because the theory rejects the appropriate causation condition, endorsing NO-C – a subject might remember an event even if his or her memory system has stored no information originating in experience of that event; in particular, the subject might remember the event by relying entirely on information acquired from an external source, such as testimony. Since there are no limits on the number of events about which one might acquire information from an external source, it follows that, for any given subject, it is possible, in principle, for that subject to remember every event that he or she has ever experienced. In other words, if simulationism is right, then, for any given subject, it is possible, in principle, for the subject never to forget an event.

Care is required when interpreting this argument, for STM does not imply that, if, for example, a subject receives testimony about an event belonging to his or her personal past and immediately forms a representation of the event, he or she is remembering since the theory counts as potential memories only the outputs of the episodic construction system. McCarroll acknowledges this point, observing that “[o]n the simulation theory, cases of relearning information in the present can, *once the information has been internalized*, subsequently count as genuine cases of remembering” (2020, 5; emphasis added). Information received from an external source, then, may form the basis of a potential memory only if it first passes through the episodic construction system, being used by the latter to generate a representation of an event belonging to the personal past. McCarroll’s reasoning could thus be rephrased by saying that (as long as PF is satisfied) STM counts *relearning* as remembering; in principle, there are no limits on relearning; so, in principle, there are no limits on remembering, and hence there need be no forgetting.⁹

Once this reasoning is made clear, it becomes evident that it poses no real difficulty for simulationism. STM does indeed imply that, if certain conditions are met, there is no forgetting. The conditions in question are, however, highly counterfactual: in order for a given subject not to undergo forgetting, it would need to be the case that, for every event that he or she experiences that is such that he or she would otherwise later be unable to form a representation of it, the subject receives and internalizes information about the event. These conditions are so remote from those that prevail in the actual world that it is entirely unclear why the fact that the simulation theory implies that, if they are met, the subject does not undergo forgetting should count as a strike against it: if the simulation theorist is willing to grant that remembering is compatible with relearning, then he or she should not hesitate to grant that, in a scenario in which everything that ordinarily would have been forgotten happens to be relearned, everything is remembered.

Something analogous, moreover, is true of the causal theorist. CTM implies that, if certain highly counterfactual conditions are met, there is no forgetting: just as the simulation theory implies that, if the subject relearns

everything that he or she ordinarily would have forgotten, then he or she does not undergo forgetting, the causal theory implies that, if the subject's memory system stores an accessible trace deriving from every event that he or she experiences, then the subject does not undergo forgetting. Thus, if McCarroll's reasoning poses a difficulty for simulationism, it poses a similar difficulty for causalism. Anticipating this point, McCarroll acknowledges that

there may also be *potentially* no forgetting on the causal theory, as long as one can access a memory trace. However, ... the notion of a trace provides an elegant explanation of the phenomenon of forgetting, and this is not an explanatory maneuver that is available to the simulationist.

(2020, 5)

Now, we saw previously that the simulationist can in fact appeal to the notion of a trace in order to explain the occurrence of forgetting, and there is nothing to prevent him or her from appealing to that notion in order to explain why forgetting occurs as often as it does. The causalist will say that forgetting occurs as often as it does because, as a matter of fact, the subject's memory system stores accessible traces deriving from only some of the events that he or she experiences. The simulationist will say the same thing, but he or she will note that a memory need not stem even in part from a trace originating in experience of the event that it represents, and he or she will supplement this explanation by pointing out that, as a matter of fact, the subject only rarely undergoes relearning. In short, both causalism and simulationism imply that forgetting need not occur in principle, but both can explain why forgetting occurs in practice.

One might object here that there is nevertheless an important asymmetry between the causalist and the simulation accounts of the frequency of forgetting. Consider, on the one hand, a case in which the subject does not store a trace deriving from a given event that he or she experiences. If the causal theory is right, then there is no way for him or her to remember the event in question at a later point in time: if no trace is available to the subject at a given point in time, then it is, by causalist lights, straightforwardly impossible for him or her to remember the event not only at that time but also at any subsequent time. Consider, on the other hand, a case in which the subject is unable to simulate a given event. If the simulation theory is right, there may be a way for him or her to remember the event in question at a later point in time: if the subject later receives and internalizes information about the event, then it will be, by simulationist lights, possible for him or her to remember the event at subsequent times. Simulationism thus implies that forgetting is reversible in certain cases in which causalism treats it as being irreversible.

Though this asymmetry is interesting, it is not clear whether it poses a problem for simulationism, for, in order to assess the objection, we would

need to have a sense not just of how often *forgetting* occurs but also of how often *irreversible* forgetting occurs, and we simply lack the latter. It is also worth noting that versions of causalism that are sympathetic to notions of extended mind and external memory (e.g., Sutton and Windhorst 2009) may have implications concerning the frequency of irreversible forgetting that are similar to those of simulationism. The objection is therefore unconvincing. We may thus set aside McCarroll's claim that the simulation theory is unable to say why forgetting occurs as often as it does.

6 Conclusion: Simulationism and Infantile Amnesia

The overall conclusion to which we are entitled to come is that, despite its commitment to NO-C, simulationism is no less able to account for forgetting than is causalism.

If McCarroll's argument for the claim that, because it endorses NO-C, simulationism is unable to account for forgetting fails, his argument for the claim that, because it endorses NO-E, simulationism is unable to account for infantile amnesia might nevertheless go through. That argument raises issues – McCarroll suggests not only that simulationism has difficulty accounting for our inability to remember early childhood events but also that it implies that we may, under certain circumstances, be able to remember events that occurred before we were even born – that simply cannot be treated in the space available here. Responding to it will therefore have to be left as a task for another occasion.

Acknowledgements

Thanks to audiences at Memory and Mind: A Sofia-Grenoble Workshop, the Language, Epistemology, Metaphysics, and Mind Research Interest Group seminar at the University of Toronto; the Thumos seminar at the University of Geneva; and the Centre for Philosophy of Memory's internal seminar. Thanks to Juan Álvarez, Anja Berninger, Chris McCarroll, André Sant'Anna, and Ingrid Vendrell Ferran for written comments. This work is supported by the French National Research Agency in the framework of the "Investissements d'avenir" programme (ANR-15-IDEX-02) and by CAPES-COFECUB (Grant Sh 967/20).

Notes

- 1 On the continuism-discontinuism debate, see Michaelian, Perrin & Sant'Anna (2020), Langland-Hassan (forthcoming-a), and Schirmer dos Santos, McCarroll, and Sant'Anna (forthcoming). The standard view, on which causalism aligns with discontinuism and simulationism with continuism, will be assumed here, but see Langland-Hassan (forthcoming-b) and Sant'Anna (2021) for alternative views. Variants of causalism have proliferated in recent years (Michaelian and Robins 2018); this chapter will take a generic causalism along the lines of that

proposed by Martin and Deutscher (1966) for granted. Variants of simulationism that may be compatible with causalism are available (De Brigard 2014a; Hopkins 2018; Shanton and Goldman 2010); this chapter will take Michaelian's (2016c) postcausal simulationism for granted. Note that Michaelian (forthcoming-a) defends a simulation theory that differs significantly from that originally proposed in Michaelian (2016c). The response to McCarroll developed here is available to partisans of both versions of the theory, and the chapter will therefore focus on the simpler version proposed in Michaelian (2016c).

- 2 Relationalist alternatives to representationalism are nevertheless worth taking seriously (Aranyosi 2020; Moran forthcoming; Sant'Anna 2020) but will not be considered here.
- 3 The contentful character of memory traces has recently been contested (see Hutto forthcoming; Hutto and Peeters 2018; Michaelian and Sant'Anna 2021; Werning 2020). McCarroll's critique of simulationism assumes that traces are contentful, and contentless approaches will not be taken into account here. There is a general lack of clarity in the literature concerning the nature of memory traces (see De Brigard 2014b, Robins 2017b); given that, as argued below, both causalism and simulationism will invoke traces in accounting for forgetting, this lack of clarity may pose problems for both accounts.
- 4 See Bernecker (2017), and Robins (2016, 2019, 2020b) for causalist treatments of confabulation.
- 5 See Andonovski (2019), Langland-Hassan (forthcoming a, b), Perrin (2021), and Werning (2020) for critiques of other aspects of simulationism.
- 6 Or at least it is not vague for the reason for which McCarroll takes it to be vague. Due to the use that it makes of the concept of reliability, which it borrows from reliabilist epistemology, STM may in fact suffer from a problematic inherent vagueness not unlike that from which the causal theory suffers. According to STM, a subject *S* remembers an event *e* only if *S*'s current representation of *e* is produced by a properly functioning and hence *reliable* episodic construction system that aims to produce a representation of an event belonging to *S*'s personal past. Just as we can ask how much reliability is required for epistemic justification, we can ask how much reliability is required for memory. And, just as there would seem to be no reason to single out any specific level of reliability in the case of justification, there would seem to be no reason to single out any specific level of reliability in the case of memory. Now, this point may not pose a problem for reliabilist epistemology. Reliabilism is a theory of justification, and, although we often say simply that a belief is justified or unjustified, this is arguably just a convenient shorthand. When speaking more carefully, we acknowledge that justifiedness comes in degrees, and hence it is desirable for the concept in terms of which justification is analyzed itself to be a matter of degree: a higher level of reliability simply means a greater degree of justifiedness. The point does, however, arguably pose a problem for simulationism. Simulationism is a theory of memory, and mnemicity presumably does not come in degrees. We say simply that a given apparent memory is or is not a genuine memory; we do not say that a given apparent memory is more or less mnemonic. Analyzing mnemicity in terms of reliability would, however, seem to commit us to saying precisely that: a higher level of reliability would mean a greater degree of mnemicity. It may be feasible for the simulationist, who already sees remembering as continuous with imagining, to argue, in response to this problem, that mnemicity does in fact come in degrees, but a detailed discussion of this possibility will have to be left for another time.
- 7 One might object here that this does not necessarily mean that the dessert theory (the causal theory) is in worse shape than the sweetener theory (the simulation theory), for it may be that desserthood (mnemicity) comes in degrees:

more sugar (more transmitted content) means greater desserthood (greater mnemonicity). It is not clear that the causalist should be prepared to say that mnemonicity comes in degrees, but, as noted earlier, it may be that, for other reasons, the simulationist should be prepared to do so.

- 8 As stated by Frise, this condition says that *S* has learned *e* rather than that *S* could previously access *e*.
- 9 McCarroll is right to suppose that STM counts (reliable) relearning as remembering. (Though Michaelian (2016b) treats relearning as being incompatible with remembering, Michaelian (2020, forthcoming-a, forthcoming-b) acknowledges that simulationists ought to treat relearning as being compatible with remembering.) But it is worth noting that the kind of relearning in question is broader than that at issue in Martin and Deutscher's influential discussion. In relearning cases of the sort described by Martin and Deutscher (1966), the subject experiences an event, tells someone else about his or her experience, forgets about the event, is told about it by the one to whom the subject related his or her experience on the basis of the testimony that he or she provided, forgets being told, and finally forms an apparent memory on the basis of the testimony with which he or she has been provided. In such cases, the proximate source of the information that forms the basis of the apparent memory is the testimony of another person, but the information itself ultimately derives from the subject's own experience. In relearning cases of the sort described by Robins (2017a), in contrast, the subject experiences an event alongside another person, forgets about the event, is told about it by the other person who experienced it on the basis of that person's own experience, forgets being told, and forms an apparent memory on the basis of the testimony with which he or she has been provided. In such cases, the information that forms the basis of the apparent memory ultimately derives from a source other than the subject's own experience. Since STM does not require that the information that forms the basis of a memory derive from the subject's own experience of the represented event, it counts not only Martin and Deutscher-style relearning but also Robins-style relearning as remembering. It thus implies, if McCarroll's reasoning is on the right track, that there need be no forgetting not only because there are, in principle, no limits on the frequency of Martin and Deutscher-style relearning but also because there are, in principle, no limits on the frequency of Robins-style relearning.

References

- Addis, D. R. 2020. Mental Time Travel? A Neurocognitive Model of Event Simulation. *Review of Philosophy and Psychology* 11(2): 233–59.
- Andonovski, N. 2019. Is the Simulation Theory of Memory about Simulation? *Voluntas: Revista Internacional de Filosofia* 10(3): 37–52.
- Aranyosi, I. 2020. Mental Time Travel and Disjunctivism. *Review of Philosophy and Psychology* 11(2): 367–84.
- Bernecker, S. 2010. *Memory: A Philosophical Study*. Oxford: Oxford University Press.
- Bernecker, S. 2017. A Causal Theory of Mnemonic Confabulation. *Frontiers in Psychology* 8: 1207.
- Caravà, M. 2021. An Exploration into Enactive Forms of Forgetting. *Phenomenology and the Cognitive Sciences* 20: 703–22.
- De Brigard, F. 2014a. Is Memory for Remembering? Recollection as a Form of Episodic Hypothetical Thinking. *Synthese* 191(2): 155–85.

- De Brigard, F. 2014b. The Nature of Memory Traces. *Philosophy Compass* 9(6): 402–14.
- Frise, M. 2018. Forgetting. In *New Directions in the Philosophy of Memory*, eds. K. Michaelian, D. Debus, and D. Perrin, 223–40. New York: Routledge.
- Hopkins, R. 2018. Imagining the Past. In *Perceptual Imagination and Perceptual Memory*, eds. F. Macpherson, and F. Dorsch, 46–71. Oxford: Oxford University Press.
- Hutto, D. D. Forthcoming. Remembering without a Trace? Moving beyond Trace Minimalism. In *Current Controversies in Philosophy of Memory*, ed. A. Sant'Anna, C. McCarroll, and K. Michaelian. New York: Routledge.
- Hutto, D. D., and A. Peeters. 2018. The Roots of Remembering: Radically Enactive Recollecting. In *New Directions in the Philosophy of Memory*, ed. K. Michaelian, D. Debus, and D. Perrin, 97–118. New York: Routledge.
- Langland-Hassan, P. Forthcoming-a. Remembering, Imagining, and Memory Traces: Toward a Continuum Causal Theory. In *Current Controversies in Philosophy of Memory* ed. A. Sant'Anna, C. McCarroll, and K. Michaelian. New York: Routledge.
- Langland-Hassan, P. Forthcoming-b. What Sort of Imagining Might Remembering Be? *Journal of the American Philosophical Association* 7(2): 231–51.
- Martin, C. B., and M. Deutscher. 1966. Remembering. *The Philosophical Review* 75(2): 161–96.
- McCarroll, C. J. (2018). *Remembering from the Outside: Personal Memory and the Perceptual Mind*. Oxford: Oxford University Press.
- McCarroll, C. J. 2020. Remembering the Personal Past: Beyond the Boundaries of Imagination. *Frontiers in Psychology* 11: 585352.
- Michaelian, K. 2011a. Generative Memory. *Philosophical Psychology* 24(3): 323–42.
- Michaelian, K. 2011b. The Epistemology of Forgetting. *Erkenntnis* 74(3): 399–424.
- 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. K. Michaelian, S. B. Klein, and K. K. Szpunar, 63–92. Oxford: Oxford University Press.
- Michaelian, K. 2016b. Confabulating, Misremembering, Relearning: The Simulation Theory of Memory and Unsuccessful Remembering. *Frontiers in Psychology* 7: 1857.
- Michaelian, K. 2016c. *Mental Time Travel: Episodic Memory and Our Knowledge of the Personal Past*. Cambridge MA: MIT Press.
- Michaelian, K. 2020. Confabulating as Unreliable Imagining: In Defence of the Simulationist Account of Unsuccessful Remembering. *Topoi* 39(1): 133–48.
- Michaelian, K. Forthcoming-a. Imagining the Past Reliably and Unreliably: Towards a Virtue Theory of Memory. *Synthese* 199(3), 7477–507.
- Michaelian, K. Forthcoming-b. Towards a Virtue-Theoretic Account of Confabulation. In *Current Controversies in Philosophy of Memory*, eds. A. Sant'Anna, C. McCarroll, and K. Michaelian. New York: Routledge.
- Michaelian, K., D. Perrin, and A. Sant'Anna. 2020. Continuities and Discontinuities between Imagination and Memory: The View from Philosophy. In *The Cambridge Handbook of the Imagination*, ed. A. Abraham, 293–310. Cambridge: Cambridge University Press.

- Michaelian, K., and S. K. Robins. 2018. Beyond the Causal Theory? Fifty Years after Martin and Deutscher. In *New Directions in the Philosophy of Memory*, ed. K. Michaelian, D. Debus, and D. Perrin, 13–32. New York: Routledge.
- Michaelian, K., and A. Sant’Anna. 2021. Memory without Content? Radical Enactivism and (Post)causal Theories of Memory. *Synthese* 198(Suppl 1): S307–35.
- Moran, A. Forthcoming. Memory Disjunctivism: A Causal Theory. *Review of Philosophy and Psychology*.
- Perrin, D. 2016. Asymmetries in Subjective Time. In *Seeing The Future: Theoretical Perspectives on Future-Oriented Mental Time Travel*, ed. K. Michaelian, S. B. Klein, and K. K. Szpunar, 39–61. Oxford: Oxford University Press.
- Perrin, D. 2021. Embodied Episodic Memory: A New Case for Causalism? *Intellectica* 74: 229–52.
- Perrin, D., and K. Michaelian. 2017. Memory as Mental Time Travel. In *The Routledge Handbook of Philosophy of Memory*, ed. S. Bernecker, and K. Michaelian, 228–39. New York: Routledge.
- Robins, S. K. 2016. Misremembering. *Philosophical Psychology* 29(3): 432–47.
- Robins, S. K. 2017a. Contiguity and the Causal Theory of Memory. *Canadian Journal of Philosophy* 47(1): 1–19.
- Robins, S. K. 2017b. Memory traces. In *The Routledge Handbook of Philosophy of Memory*, eds. S. Bernecker, and K. Michaelian, 76–87. Abingdon: Routledge.
- Robins, S. K. 2019. Confabulation and Constructive Memory. *Synthese*, 196(6): 2135–51.
- Robins, S. K. 2020a. Defending Discontinuism, Naturally. *Review of Philosophy and Psychology*, 11(2): 469–86.
- Robins, S. K. 2020b. Mnemonic Confabulation. *Topoi* 39(1): 121–32.
- Sant’Anna, A. 2020. The Hybrid Contents of Memory. *Synthese* 197: 1263–90.
- Sant’Anna, A. 2021. Attitudes and the (Dis)continuity between Memory and Imagination. *Estudios de Filosofia* 64: 73–93.
- Schirmer dos Santos, C., C. J. McCarroll, and A. Sant’Anna. Forthcoming. The Relation between Memory and Imagination: A Debate about the “Right Concepts”. In *Current Controversies in Philosophy of Memory*, eds. A. Sant’Anna, C. J. McCarroll, and K. Michaelian. New York: Routledge.
- Shanton, K., and A. I. Goldman. 2010. Simulation theory. *Wiley Interdisciplinary Reviews: Cognitive Science* 1(4): 527–38.
- Sutton, J., and G. O’Brien. Forthcoming. Distributed Traces and the Causal Theory of Constructive Memory. In *Current Controversies in Philosophy of Memory*, eds. A. Sant’Anna, C. McCarroll, and K. Michaelian. New York: Routledge.
- Sutton, J., and C. Windhorst. 2009. Extended and Constructive Remembering: Two Notes on Martin and Deutscher. *Crossroads* 4(1): 79–91.
- 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): 301–33.