



Relearning and remembering

A gradualist account

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Abstract

Relearning and remembering are usually seen as two distinct cognitive processes in contemporary philosophy of memory. In particular, relearning is sometimes regarded as a kind of memory error. This paper aims to address two questions. First, is relearning a kind of memory error? Second, how to draw a distinction (if any) properly between relearning and remembering? My answer to the first question is a conditional ‘yes’—it depends on whether relearning can be falsidical and whether metacognitive monitoring counts as a part of memory process. My answer to the second question appeals to a *gradualist* account, according to which the distinction between relearning and remembering is not an absolute yes-or-no affair, but a matter of degrees.

Keywords

Forgetting · Gradualism · Relearning · Remembering · Source monitoring

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In contemporary philosophy of memory, remembering and relearning are two important concepts. They are usually also regarded as two distinct processes. This paper purports to answer two questions: (1) *The memory error problem*: Is relearning a kind of memory error? (2) *The distinction problem*: How should we draw a proper distinction (if any) between relearning and remembering? This paper will proceed as follows. In Section 1, I will briefly introduce some existing attempts to distinguish relearning from remembering made by influential philosophers of memory. Section 2 will provide a conditionally affirmative answer to the memory error problem: relearning is a kind of memory, if relearning is factive and source monitoring is a part of memory process. Section 3 will elaborate on three desiderata for a satisfactory answer to the distinction problem. Accordingly, a gradualist answer will be proposed in Section 4, which suggests that the distinction between

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1 Drawing the distinction

Kent once had a terrible date with a girl. Kent told his friend Gray how he screwed up the date—how he overslept, kept the girl waiting for an hour, and then offended the girl during their date... Shortly after this, Kent was involved in a car accident and he got a blow on the head which destroyed all memory of a period in his past, including the terrible date. When Gray found that Kent could no longer remember the past, he told Kent every detail about the date which Kent had told him before. After a little while, at time t , Kent forgot *that* Gray has told him about the date, but can still recall *what* he was told by Gray. Now the question is: at time t , did Kent genuinely (episodically) remember¹ the date?

The case above is adopted from the seminal work of Martin & Deutscher (1966), where their verdict is that Kent clearly does not *remember* the date itself (Martin & Deutscher, 1966, p. 180). Instead, Martin & Deutscher maintain that Kent just *relearned* his experience of the terrible date. This distinction between remembering and relearning is also reflected in the Diary Case below:

For consider a case in which a person knows that p at time t , writes it in his diary, forgets it completely, and relearns that p from what he wrote in his diary. If he had no other source of information, then he would not now know that p , if he had not known that p at time t . Yet it does not follow that he remembers that p from time t . Often he will only remember that p from the time at which he subsequently reads his diary. (Martin & Deutscher, 1966, p. 194)

In this case, the diary just plays the same role that Gary plays in Kent's Case. They help the protagonist to 'restore' information about some past events that the protagonist experienced, and then retail those events to the protagonist such that they can be learned again by the protagonist who has once forgotten them. Our protagonists are *prompted* by virtue of Gary or the diary. For Martin & Deutscher, our protagonists merely *relearn* those events, rather than genuinely *remember* them.

The remembering/relearning distinction is important for Martin & Deutscher's causalist theory of (episodic) memory, according to which successful remembering a past event requires a proper causal connection between the event and the subject's current mental representations of it. The *causal connection* here requires some further restrictions. For example, it further requires that the subject's past

¹ There are different types of memory, for example, psychologists usually distinguish semantic memory from episodic memory. Correspondingly, one can remember semantically or episodically. This paper focuses on episodic memory. And unless otherwise noted, the term 'remembering' typically refers to 'episodic remembering' hereafter.

experience is operative in producing her representation of the event, *given that she is prompted* (see Martin & Deutscher, 1966, p. 186). Cases of relearning violate this additional condition. As we have noted, in Diary Case and Kent's Case, the protagonists are *prompted* by the diary/the friends' testimony. It can be said that there is a causal connection between the prompting and the protagonist's experience of the target event, in the sense that the former would not have occurred without the latter. However, this is not *the kind of* causal connection that Martin & Deutscher require, because the protagonist's past experience is only operative in bringing about the prompting, rather than operative in producing her representation of the event, *given that she is prompted*.

In general, the causal theory of memory holds that successful remembering requires a *proper* causal connection between the event remembered and its current representation. Cases of relearning serve to exemplify what an *improper* causal connection can be like. Martin & Deutscher's remembering/relearning distinction is inherited and further developed by subsequent causalists. For example, Robins (2016) argues that successful remembering requires: 1) *the retention condition*: the retention of discrete representations of particular past events; and 2) *the accuracy condition*: accurate representations of past events. In contrast, relearning, which is classified as a kind of memory error by Robins, occurs when the accuracy condition is met, but not the retention condition (see Robins, 2016, p. 446). Accordingly, we can explain the Diary Case and Kent's Case in the following way: protagonists in these cases fail to remember, because they fail to retain representations of the target events all along—the retention breaks off when information about the target event is (completely) forgotten. Nevertheless, when they regain relevant information from some reliable sources (Gary or the diary) their representations reconstructed are accurate, so they can be recognised as *relearning* the target event.

This idea is echoed by Bernecker (2017), who argues that relearning is typically preceded by *forgetting*, which can be seen as violating the retention condition. Differing from Robins, Bernecker refuses to regard relearning as a memory error because he does not think that forgetting is always a memory error. Nevertheless, Bernecker also notes that relearning is sometimes accompanied by *source monitoring errors* (see Bernecker, 2017, p. 11). Roughly speaking, source monitoring is a kind of metacognitive monitoring function of identifying the origins of one's mental representations. It typically includes *external source monitoring* (discriminating between externally retrieved sources, e.g., friends' testimonies), *internal source monitoring* (discriminating between internally derived sources, e.g., my memories), and *internal-external reality source monitoring* (discriminating between internally and externally retrieved sources). This discrimination can be done by heuristically or systematically evaluating a mental representation's vividness, consistency, plausibility, coherence, etc. (see Johnson et al., 1993). Bernecker regards source monitoring error as a memory error 'where the source of a memory is incorrectly attributed to some specific recollected experience' (Bernecker, 2017, p. 11). Arguably, what he refers to is internal-external reality source monitoring, which

occurs when Kent mistakenly believes that his experience of the terrible date is always remembered all along rather than being retold by Gary after the accident.

The distinction between remembering and relearning is not only discussed by causalists, but is also emphasised by philosophers from the simulationist camp as well. For example, Kourken Michaelian (2016b) agrees that relearning is a cognitive process distinct from remembering, but he disagrees with Robins on how the distinction should be characterised. For Michaelian, neither the accuracy condition nor the retention condition is necessary for distinguishing remembering from relearning. The accuracy condition is unnecessary because Michaelian maintains that relearning is not factive. That is, he thinks that there can be falsidical relearning, for example, when Gary's retelling of the story of Kent's terrible date involves a gross distortion which Kent fails to detect. We will probe into this point again in Section 2. Before that, let us see why Michaelian holds that the retention condition, *contra* Robins, cannot distinguish relearning from remembering. The retention condition requires that the retrieved apparent memory involves information originating from the target event. On the contrary, Michaelian's simulation theory of memory holds that the constructive nature of episodic memory implies that in recalling a past event, we do not always retrieve retained information originating from the very event. Instead, episodic memory will sometimes incorporate relevant information from other similar events. For Michaelian, remembering an event *e* only requires that one'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 (Michaelian, 2021, p. 7485).² Accordingly, in principle, we should allow one's episodic memory of a past event to be constructed *without* drawing on any information originating from the particular event (see Michaelian, 2016a). This means that retention is unnecessary for remembering. Recall that Robins holds that relearning differs from remembering in that the former lacks retention. If Michaelian is right, then both remembering and relearning do not need to meet the retention condition, and hence retention fails to differentiate the two processes.

So, how should we depict the distinction between relearning and remembering if neither retention nor accuracy is necessary? Michaelian (2016b) argues that what really matters is *internality*, which is what remembering requires while relearning lacks. He introduces the internality condition³ as a necessary condition for remembering, which requires that in order to be recognised as remembering a past event, one has to contribute content to the retrieved memory representation. This contribution can be made when the representation is produced by the subject's properly functioning episodic construction system. In contrast, if the subject's memory of

² Michaelian (2022) recently further radicalizes his simulation, according to which to remember is simply to imagine an event from the past, regardless of whether that event belongs to one's personal past.

³ Michaelian (2020) seems to abandon this condition. For debates around the internality condition, see McCarroll (2020) and Michaelian (2022).

an event depends entirely on an external prompt, then no contribution can be credited to the subject. Relearning belongs to the latter case and thus is about lack of internality:

Instead, relearning seems to be about failure to satisfy an internality condition. Intuitively, veridical relearning occurs in cases in which the subject seems to remember, and to remember accurately, but in which he himself contributes no content to the retrieved memory representation; falsidical relearning occurs in cases in which the subject seems to remember, though to remember inaccurately, and in which he himself contributes no content to the retrieved memory representation. (Michaelian, 2016b, p. 9)

The internality condition can seem to explain Kent's Case in this way: although Kent told Gary about his terrible date before, the car accident deprived Kent of the ability to contribute content to his apparent memory representation of the date. Instead, his retrieved memory representation depends completely on what Gary retold him. The Diary Case can also be accounted for in a similar way. In both cases, the protagonist's apparent memory representations depend entirely on external prompts, namely, Gary and the diary, and thus the internality condition is not met.

Before we get down to the nitty-gritty of the task before us, a summary of what has been introduced will be helpful. To sum up, the majority of philosophers of memory agree that relearning and remembering are two different processes. However, their divergences focus on two problems. First, is relearning a type of memory error? Call this *the memory error problem*. Robins sees relearning as a memory error, while Bernecker and Michaelian disagree. Second, how exactly is relearning distinct from remembering? Call this *the distinction problem*. Causalists such as Robins hold that the central difference between the two processes is about *retention*, while simulationists like Michaelian suggest that *internality* is the key. In what follows, I will address these two problems respectively.

2 Is remembering a memory error?

Let me start with the memory error problem. Robins classifies relearning as a type of memory error. It seems that she does so because relearning *fails* to meet a necessary condition for successful remembering, *viz*, 'the retention condition' (see Robins, 2017) or 'the causal history condition' (see Robins, 2020). Moreover, Robins also suggests that relearning is accompanied by *the loss of capacity* to represent information acquired from past events, which is a capacity that remembering requires:

Remembering and relearning are both causal relations but they differ because, in the former case, the capacity to produce this representa-

tion stays within the same cognitive system from which the subsequent representation is produced. In relearning, the system loses this capacity and so the information must be reacquired. (Robins, 2017, p. 10)

However, just because relearning fails to meet some conditions that are necessary for successful remembering, it does not mean that relearning is therefore a memory error. Guessing and knowing are usually seen as two different processes by epistemologists, in the sense that guessing might fail to meet some necessary conditions for knowing, such as justification or safety (see Pritchard, 2016). But this does not imply that guessing is thus a ‘knowledge error’ or ‘epistemic error’, Intuitively speaking, it is odd to say that guessing is a type of knowledge/epistemic error especially when the aim of the guessing is not knowledge but, for example, mere true beliefs or even just some random beliefs (when the guesser does not care about the result but just guesses for fun). Similarly, if relearning does not even aim at remembering, or does not rely on the same psychological process that leads to remembering, then it seems implausible to classify it as a memory error. Too many processes distinct from remembering lack the necessary conditions for remembering, but it is clearly not the case that they are all memory errors. *The loss of capacities* required by remembering also does not suffice to make a process a memory error. For example, forgetting can be seen as being accompanied by the loss of capacity to retain or retrieve representation information acquired from past events that is required by remembering. But just as Bernecker noted, forgetting is something that ‘may or may not be regarded as a memory error’ (Bernecker, 2017, p. 11).⁴

Nonetheless, this is not to say we do have more plausible reasons for thinking that relearning can at least sometimes come in the form of a memory error. Recall that one central disagreement between Michaelian and Robins is whether relearning is factive. From the perspective of English language usage, it appears that ‘learning’ is factive⁵ in the sense that whenever we say someone learns that p , we usually expect that p refers to a true proposition. If that is the case, then it seems natural to posit that re-learning is also factive. However, Michaelian does not primarily understand relearning from the perspective of how ‘relearns’ is used in ordinary language. Instead, he regards relearning as a cognitive process, which might end up with accurate or inaccurate representations:

But regardless of how the term is ordinarily used, relearning should not be treated as factive here, for the straightforward reason that one and the same relearning process might lead to the formation of either

⁴ For when and why forgetting should better not to be seen as a memory error, see also Michaelian (2011).

⁵ For dissenting voices, see Hazlett (2010).

an accurate or an inaccurate representation. (Michaelian, 2016b, p. 5)

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In order to see how relearning can be non-factive, let us take a concrete example. Suppose that in the aforementioned Diary Case, the diary somehow contains inaccurate records of the subject's personal past, and later on the subject consults and trusts it anyway. This will constitute a case of what Michaelian calls 'falsidical relearning' (see Michaelian, 2016b, p. 5). For Michaelian, the inner mental process that the subject undergoes in falsidical relearning is entirely the same as that in veridical relearning. The only difference is the accuracy of the diary's content, which is external to the subject's psychological process of relearning. Therefore, if we understand relearning primarily as a cognitive process, especially a psychological process, then there can be cases where relearning turns out to be falsidical. As a result, it seems that falsidical relearning can be plausibly taken to be an error in the sense that it ends up with inaccurate representations that are unwelcome for a cognitive process.

However, it remains unclear whether this error should count as a *memory* error. That is because it is unclear how closely relearning is related to a memory process. Certainly, the kind of relearning that we have discussed so far is about past events,⁷ which is in line with remembering. However, this similarity does not suffice to make relearning a memory error, just like it is farfetched to classify all errors about the past as memory errors. Another connection between relearning and remembering is forgetting. Both Bernecker and Robins agree that relearning is typically preceded by forgetting, which seems to be relevant to our memory processes. Since we have noted that forgetting is not always a memory error, we can at most conclude that falsidical relearning is a kind of memory error when it is preceded by *the kind of* forgetting that is usually categorized as 'memory errors from omissions' (Bernecker, 2017, p. 1), which refer to failures to encode or correctly retrieve information of past events.

A stronger connection might lie in source monitoring error. Bernecker notes that relearning is sometimes accompanied by a kind of source monitoring error, which occurs when you think that a mental representation comes from your prior experiences while in fact it comes from some other source, such as testimony. The two cases discussed at the beginning of this paper both belong to this kind of relearning. The protagonist mistakenly takes his apparent memory, which is in fact based on testimony from his friend or his diary, to be based on his own experiences of the target event. In other words, he mistakes the external source of his representation for the internal source. For Bernecker, this source monitoring error is a type of memory error, but Michaelian holds a different opinion. Michaelian

⁶ In the same vein, Michaelian (2016b) holds that there is not only falsidical confabulation, but also veridical confabulation.

⁷ In principle, there might well be cases of relearning where what is relearned is not about past events, but about some hard facts about the world, such as 'London is the capital of the UK'. This paper will put this type of relearning aside.

argues that source monitoring error is ‘an error of a sort other than those with which the memory error debate is concerned’ (Michaelian, 2021, p. 7490). Hence even if relearning is a kind of error, it is not a type of memory error.

With that being said, it should be clear that the key question here is whether the kind of source monitoring error stated above is a memory error. If it is, then this provides grounds for holding that the type of relearning that involves source monitoring error can thereby be seen as a type of memory error. To answer this question, it will be helpful to figure out whether source monitoring process is a component of what is known as ‘memory process’. As far as I can see, there are some significant motivations for thinking that it is. For instance, psychologists such as Marcia K. Johnson maintain that ‘[a]ll episodic tasks involve making attributions about the origin of mental experiences (source monitoring)’ and ‘episodic memory tasks all have a source monitoring component (e.g., “What items do you remember from the experimental context?”)’ (Johnson, 2005, pp. 529–530). If that is right, then episodic memory process, as a kind of episodic task, also has source monitoring as its component. Consequently, a source monitoring error will become an error of the memory process, namely, a memory error.

In addition, some influential theories of episodic memory in contemporary philosophy of memory also recognise source monitoring as something that is indispensable for the phenomenology of episodic memory. For example, Dokic’s (2014) two-tiered account of episodic memory argues that the phenomenal characteristics of episodic memory involve two separate components: a first-order memory about the past, and a metacognitive episodic feeling of knowing.⁸ The latter is based on the subpersonal metacognitive monitoring mechanisms including source monitoring. Given that source monitoring is responsible for shaping the phenomenal characteristics of episodic memory, it is natural to posit that it is a component of the memory process. When a source monitoring error occurs, the subject’s apparent memory representation wrongly has the phenomenal characteristics of a genuine/accurate memory representation. In this sense, it also constitutes a memory error.

Now we can encapsulate our answer to the memory error problem as a conditional: *if* source monitoring errors are memory errors, *then* relearning featured with source monitoring errors is a type of memory error. Note that I do not intend to argue that the antecedent must be true, and I admit that Johnson’s and Dokic’s theories might not provide conclusive support to it. However, there are more reasons for thinking that the antecedent is plausible. For instance, Schacter (2021) has famously classified ‘misattribution’ as one of the ‘seven sins of memory’, viz, seven basic misdeeds/errors of memory. By ‘misattribution’, Schacter means the phenomena of attributing a recollection or idea to the wrong source, which, according to the source monitoring framework, basically amounts to a kind of source monitoring error. Laney (2013, p. 237) also classifies a source monitoring error as a sort of memory error that might occur during the stage of memory reconstruction. Stan-

⁸ This view is echoed and further developed by Perrin et al. (2020).

gor & Walinga's (2014) *Introduction to Psychology* also notes that '(o)ne potential error in memory involves mistakes in differentiating the sources of information' (Stangor & Walinga, 2014, Chapter 9.3).

Now let us take stock of what has been achieved so far. We have noted that although relearning fails to meet some necessary conditions or manifest some essential capacities for remembering, it does not automatically make relearning a memory error. To reinforce the connection between relearning and memory error, two key questions need to be answered. First, is relearning factive? If not, just as Michaelian has argued, then relearning is an error (no matter whether it is a *memory error*) when it is falsidical, if we see falsity as something that is unwelcome for a cognitive process. Second, is a source monitoring error a memory error? If metacognitive monitoring process is a component of the episodic memory process (*cf.* Dokic's two-tiered account of episodic memory), then yes. Correspondingly, relearning is a memory error when it involves a source monitoring error. With that being said, we can answer the memory error problem with a conditional 'yes'.

3 Desiderata for a satisfactory solution to the distinction problem

Before offering my own solution to the distinction problem, I would like to take a closer look at what a satisfactory solution should be like. Certainly, it has to accurately capture the distinction between remembering and relearning, and it would be ideal if it enjoys empirical support. Apart from these, there are three puzzling problems that those existing proposals introduced in Section 1 have difficulties accommodating. Hence a new proposal will be preferable if it can solve the three problems below.

3.1 The psychological classification problem

The mainstream philosophy of memory nowadays seeks to be empirically informed (*cf.* Craver, 2020). At least, all those philosophers of memory aforementioned, causalists or simulationists, are empirically-minded. Hence a philosophical depiction of the relation between relearning and remembering is expected to be consistent with our best memory science. As we have noted before, philosophers of memory seem to see relearning and remembering as two qualitatively distinct cognitive processes. However, in the psychological literature, relearning bears a much more intimate relation to remembering than how philosophers present it. For example, in many psychological textbooks, along with recall and recognition, relearning is classified as *a form of retrieval*, which is a stage of remembering:

There are three ways you can retrieve information out of your long-term memory storage system: recall, recognition, and relearning...The third form of retrieval is relearning, and it's just what it sounds like.

It involves learning information that you previously learned. Whitney took Spanish in high school, but after high school she did not have the opportunity to speak Spanish. Whitney is now 31, and her company has offered her an opportunity to work in their Mexico City office. In order to prepare herself, she enrolls in a Spanish course at the local community center. She's surprised at how quickly she's able to pick up the language after not speaking it for 13 years; this is an example of relearning. (Lumen Learning, 2022)

Similarly, relearning (also known as 'restudying' in the psychological literature) is taken to be a passive form of retrieval (see Gao et al., 2016, p. 977) in contrast with active retrieval such as recognizing. Related to this is another classic reading of relearning in the field of psychology, which regards relearning as a measure (again, along with recall and recognition) of memory's retention, that is, how quickly can you process information that you previously learned:

A third way of measuring memory is known as relearning (Nelson, 1985). Measures of relearning (or savings) assess how much more quickly information is processed or learned when it is studied again after it has already been learned but then forgotten. If you have taken some French courses in the past, for instance, you might have forgotten most of the vocabulary you learned. But if you were to work on your French again, you'd learn the vocabulary much faster the second time around. Relearning can be a more sensitive measure of memory than either recall or recognition because it allows assessing memory in terms of "how much" or "how fast" rather than simply "correct" versus "incorrect" responses. (Stangor & Walinga, 2014)

This *measure reading* is not necessarily incompatible with the *retrieval reading*, in the sense that we often measure one's memory in terms of what and how one can retrieve. Both readings take relearning to be in parallel with recall and recognition, while some psychologists view relearning as paralleling retrieval. For example, MacLeod (2013) sees relearning, along with retrieval, as one of what he calls 'the six R's of remembering', viz, six basic components of remembering. For MacLeod, relearning corresponds more to what is traditionally thought of as the encoding process of memory, in the sense that it promotes entry of events into memory (MacLeod, 2013, p. 38).

With these psychological readings in play, it should be clear that in the field of psychology, relearning is not understood as an independent process that is qualitatively distinct from remembering. Instead, psychologists tend to treat relearning as a constituent part of the remembering process, whether as a component of remembering itself, or as a form of a substage of remembering (*i.e.*, retrieval). These psychological readings thus stand in stark contrast to those philosophical readings of the relation between the two processes, according to which relearning is clearly

different from remembering such that we should make a clear judgment in various cases whether the protagonist is relearning or remembering. This asymmetry poses a threat to existing philosophical proposals introduced above as they seek to be empirically informed. Now the question is: How should we accommodate this asymmetry? Call this *the psychological classification problem*.

There might be a worry like this: While psychologists and philosophers use the same term, they may be talking about different phenomena. If this is just a case of homonymy, then the psychological classification problem is ill-motivated.

I acknowledge this possibility but still think that the psychological classification problem is important for several reasons. First, the psychological uses of ‘relearning’ are not so different from its philosophical uses. For example, MacLeod’s (1976, 2013) studies of relearning involve participants who learned a list of paired words and then had *forgotten* many of them weeks later. MacLeod then studies how well those forgotten words can be relearned (for similar tests, see Gao et al., 2016). These parallel those philosophical cases of relearning as they all involve a ‘learning-forgetting-restudying’ structure, especially if we accept that forgetting comes in degrees. Second, indeed, some philosophical cases of relearning are featured by metacognitive errors that are absent in most psychological cases. However, there is no principled reason why the philosophical uses of ‘relearning’ must be accompanied by metacognitive errors. Bernecker also admits that relearning is only ‘sometimes’ (Bernecker, 2017, p. 11) accompanied by a source monitoring error. Third, even if those oft-discussed philosophical uses of ‘relearning’ are substantially different from its psychological uses, an account that can accommodate both uses will still be preferable to one that only focuses on either the philosophical or the psychological uses. That is because, insofar as philosophy of memory seeks to be empirically-informed, a more psychology-inclusive account of relearning will be superior due to its broader explanatory power. After all, it seems inconsistent if philosophers of memory strive to build their accounts of remembering/confabulating/forgetting/misremembering on the basis of psychological evidence, but leave relearning as an exception. It is unclear why they should be satisfied with leaving the philosophical understanding and the psychological understanding of relearning incommensurable.

3.2 The extended memory problem

One of the most influential theories in the field of philosophy of cognitive science over the past few decades is the extended cognition thesis (see Clark & Chalmers, 1998), according to which cognitive processes do not only locate inside our skin and skull, but can be *extended* into the ‘external’ world. External resources can constitute a coupled cognitive system together with my internal resources such as my biological memory. In this sense, external resources such as a notebook or my iPhone can also be acknowledged as part of my mind. Therefore, it is natural to posit that memory can also be extended insofar as we see memory process

as a paradigmatically cognitive process. In fact, in their pioneering paper (Clark & Chalmers, 1998) published in *Analysis*, Clark and Chalmers did use a case of extended memory to unfold their argument:

Otto suffers from Alzheimer's disease, and like many Alzheimer's patients, he relies on information in the environment to help structure his life. Otto carries a notebook around with him everywhere he goes. When he learns new information, he writes it down. When he needs some old information, he looks it up. For Otto, his notebook plays the role usually played by a biological memory. Today, Otto hears about the exhibition at the Museum of Modern Art, and decides to go see it. He consults the notebook, which says that the museum is on 53rd Street, so he walks to 53rd Street and goes into the museum. (Clark & Chalmers, 1998, pp. 12–13)

Extended cognition theorists maintain that Otto does *remember* that the museum is on 53rd Street. His remembering process is extended into this notebook. This conclusion is drawn on the basis of what Clark and Chalmers call *the parity principle*: When we confront some cognitive tasks and a part of the world (e.g., Otto's notebook) functions as a process which, were it to go on in the head, we would have no hesitation in accepting as part of the cognitive process, then that part of the world should also be recognized as part of the cognitive process (see Clark & Chalmers, 1998, p. 8).⁹ Otto's notebook seems to play the role of our biological memory especially in the sense that it helps to accomplish the task of restoring information. Otto's case is fictional, but more and more philosophers nowadays believe that there are some real-life methods of extending memory. An oft-discussed example is SenseCams:

These are small wearable cameras worn around one's neck with a lanyard, designed to help people capture and remember their daily activities. SenseCams have an ultra-wide angle lens, maximizing the amount of information captured by the camera. It automatically takes photos without the agency of the user when its internal sensors detect a change in environmental conditions (e.g., light intensity, GPS location), but also has a trigger button that can be used to take a photo. These photos are uploaded onto a computer and viewed using a simple interface. Since their introduction in 2006, SenseCams have been used by cognitively healthy people and people with memory disorders like dementia and amnesia. These devices are often used by lifeloggers, which are people who use technology to record and store information about their activities into a lifelog. (Heersmink, 2020, p. 7)

⁹ Their proponents later on develop more sophisticated criteria for extended cognition, such as *integration and complementarity* (Menary, 2008), *mutual manipulability* (Craver, 2007), and *continuous mutual interaction* (Orestis Palermos, 2014).

Philosophers such as Heersmink argue that by virtue of SenseCams, our memory process can be extended in the sense that the SenseCam is integrated into and complementary to our inner autobiographical memory. Both Otto's notebook and SenseCams serve as external prompts that help us to retrieve representations of past events, and we have good reasons for accepting that we can remember those past events better with the help of those external prompts.

However, compare the case of Otto with Martin and Deutscher's case of Diary and the case of Kent. There do not seem to be any substantial differences between those cases, except for the metacognitive aspect. First, Otto's notebook, Gary's retelling, and the diary's records are all external prompts. Moreover, they constitute what Martin and Deutscher call 'complete prompting' (Martin & Deutscher, 1966, p. 182) as the protagonist's apparent memory representations depend entirely on the external prompt. In all the three cases, the protagonists' past experiences are 'not operative in bringing about' their representations of the past events, given that they are prompted (Martin & Deutscher, 1966, p. 186). Generally speaking, this is an indicator of relearning rather than remembering. Besides, Otto forgets what he learnt soon after writing them down in the notebook, so he neither retains the information all along nor contributes any content to his representations by himself. Therefore, Otto's case seems to involve various hallmarks of a case of relearning: it is preceded by forgetting (*cf.* Bernecker, 2017), it violates the retention condition (*cf.* Robins, 2016), and it violates the internality condition (*cf.* Michaelian, 2016b).¹⁰ Admittedly, Otto contributes content to his notebook and uses the notebook to retain information. But this is just like what happens in the Diary Case, where the subject contributes content to his diary and uses the diary to retain information after he completely forgets about the past. So is Kent's case, where Gary plays the same role as the diary and Otto's notebook in helping to restore Kent's forgotten information and prompt him. Now the remaining question is whether the metacognitive differences between Kent and Otto suffice to prevent us from counting Otto as relearning. Key to this question is whether relearning must be accompanied by a metacognitive error. As we have noted before, there is no principled reasons for insisting that it must.

The upshot is, if we accept that in the Diary Case and Kent's Case, our protagonists are just relearning rather than remembering, then it seems that we have to also conclude that Otto is relearning rather than remembering for the sake of consistency. If so, then what is extended is not the remembering process, but the relearning process, which is in conflict with the widely accepted extended cognition theory. Now the question is: How should we accommodate this conflict? Call this *the extended memory problem*. Again, this problem plagues existing proposals

¹⁰ Proponents of the extended mind thesis might maintain that Otto is not relearning, as his memory system is extended. However, as we will soon see, this exactly indicates the tension between the extended mind theory and the traditional (non-gradualist) account of relearning, which thereby motivates the extended memory problem: How can we reconcile this tension? Thanks to an anonymous reviewer for raising this point.

introduced before. Proponents of those existing proposals can of course attempt to dismiss this problem by rejecting the idea of extended memory (cf. Michaelian, 2012). However, given how popular and constantly-evolving the extended cognition theory is, it would take a fair amount of philosophical energy to convince us to the contrary, especially when dealing with new criteria apart from the parity principle. Hence, a proposal that can reconcile this conflict will be preferable.

3.3 The gradability problem

It is undeniable that both remembering and relearning can be achieved with the help of external prompts. The received philosophical wisdom seems to suggest that what would make a difference is to what extent one's retrieved representations *depend on* external prompts. According to Martin and Deutscher, *complete prompting* is incompatible with remembering, which occurs when the subject's apparent memory representations of an event depend *entirely on* an external prompt. In cases of complete prompting, the subject is at most relearning. Similarly, Michaelian's internality condition implies that '[r]elearning, as the term is used in the relevant literature, occurs in certain cases in which the subject's memory of an event depends entirely on an external prompt' (Michaelian, 2016b, p. 3). Accordingly, if one contributes *no* content to her apparent memory representations, in other words, if one's representations depend entirely on external prompts, then one is only relearning rather than remembering.

However, both *dependence* and *contribution* come in degrees, in the sense that one's representations can be attributable partially to the agency and partially to external prompts. Now the question is: To which degree must the content of the retrieved representations be contributed by the subject such that she can only be recognized as remembering rather than relearning? In other words, to which degree must the subject's retrieved representations depend on external prompts such that she can only be recognized as relearning rather than remembering? Call this *the gradability problem*.

Intuitively, if the distinction between relearning and remembering relies on two gradable notions, namely dependence and contribution, then the distinction between relearning and remembering should also be gradational. However, Martin and Deutscher and Michaelian seem to suggest that there is an absolute threshold distinguishing remembering and relearning, and the threshold is located at the endpoints of the scale of dependence/contribution. That is, relearning only occurs when representations depend *entirely* on external prompts and the subject contributes absolutely *no* content. However, if relearning requires that the subject contributes absolutely zero content to the retrieved representations, this would seem to make relearning extremely rare (if not impossible) in daily life. Recall that relearning is usually regarded as a way of measuring memory by psychologists, and it is found that you can process what you are relearning more quickly than what you have never learned before. It is hard to explain this phenomenon if there

is completely no relevant memory residue that makes you prompted when you are relearning. But if your memory residue does play a role in helping you to process information relearned more quickly, then your representations do not seem to *entirely* depend on external prompts. Suppose that in Kent's Case, Kent's mental representation of the terrible date is partially complemented by his residual memory of the location of the restaurant where he quarrelled with the girl. Would this make Kent's episodic reconstruction a case of remembering rather than a case of relearning, just because a tiny piece of the whole picture of his is contributed by Kent's own memory? Intuitively, this sets a threshold that is too demanding for relearning and too lenient for remembering.

Another way to understand the gradability problem is to consider the relation between relearning and forgetting. Provided that relearning is typically preceded by forgetting while remembering is not (*cf.* Bernecker, 2017), it is noteworthy that forgetting also comes in degrees. One can slightly forget, partially forget, or completely forget a past event. The gradability problem can thus be phrased as follows: To which degree must the subject forget the original event such that she can only be recognized as relearning rather than remembering when external prompts are in play? Let us take a concrete case for example:

MILD OTTO: Otto suffers from Alzheimer's disease with only mild symptoms. He has difficulties remembering past events independently, but he can still retain some episodic memories (albeit not much). Otto carries a notebook around with him everywhere he goes. When he learns new information, he writes it down. When he needs some old information, he looks it up. Information in the notebook can often evoke some relevant episodic memories of his past experiences. Today, Otto hears about the exhibition at the Museum of Modern Art, and decides to go see it. He consults the notebook, which says that the museum is on 53rd Street. This reminds him of the first time he visited the museum.

Is Mild Otto relearning or remembering? This seems to be a hard question to answer, as there are apparently good reasons for choosing either option. In this case, Otto's biological memory system does forget past events to a large degree. However, the fact that he can be reminded of past experiences by the notebook indicates that he still has memory residue. Mild Otto thus constitutes a borderline case where it would be arbitrary to classify it as an absolute case of relearning or a case of remembering. Existing proposals introduced before lack the resources to accommodate this arbitrariness because they are committed to the idea that there must be a clear distinction between relearning and remembering. The cut-off point locates at either zero content contribution from the subject, 100 per cent dependence on external prompts, or complete forgetting of past events.

With that being said, in order to solve the gradability problem and the other two problems introduced in this section, perhaps we should consider more seri-

ously the possibility that there is no absolute threshold distinguishing relearning and remembering. My own solution to the distinction will be based on this idea.

4 A gradualist solution to the distinction problem

I would like to propose a *gradualist solution* to the distinction problem. Central to this solution is the idea that the distinction between relearning and remembering is not an absolute yes-or-no affair, but a matter of degrees. Remembering differs from relearning in terms of the degree to which the past episodes are forgotten, or the degree to which the content of retrieved representations is attributable to the subject, or the degree to which one's retrieved representations depend on external prompts. But there is no clear cut-off point distinguishing remembering from relearning among the scale of forgetting and the scales of content-contribution. Their gradational distinction comes in the form of a spectrum. That is to say, the correct question to ask when encountering borderline cases like Mild Otto is not 'whether the subject remembers or relearns', but 'to what degree is the subject remembering and to what degree is the subject relearning?' Of course, the answer to the latter question does not have to be extremely precise such that a percentage number is needed. What is important is not to quantify an exact figure, but to find out the correct question to ask.

In order to put some flesh onto the bones of this proposal, let us draw an analogy between this gradualist solution and *epistemic gradualism*. Simply put, epistemic gradualism is a view that propositional knowledge (*viz.*, knowledge-that) is gradable just as knowledge-how is ordinarily taken to be (see Hetherington, 2001, 2011). The gradability of knowledge can be understood from two dimensions. The first is the internal dimension, that is, inside the category of knowledge-that, whether a proposition can be known better or worse. The second is the external dimension, which concerns whether the distinction between knowledge and non-knowledge is absolute or gradational. To put it differently, whether there is a clear threshold between knowledge and lack thereof. Epistemic gradualism argues that, first, knowledge-that can be better or worse; second, there is no threshold distinguishing knowledge from anything that falls short of [see Lai 2020; 2021; Lai (2022b)].

Among them, the external dimension of gradability is more germane to the problem that I purport to solve. Elsewhere (see Lai, 2022a, 2022b), I have argued that external epistemic gradualism can be employed to solve *the threshold problem for knowledge*, which is a problem that is analogous to the distinction problem that this paper aims to address. Given that most epistemologists agree that knowledge is fallible, one may naturally wonder 'what is the maximum degree of fallibility that is allowable in knowledge's justificatory component' (Hetherington, 2006, p. 42). Combining this with the epistemologically orthodox idea that knowledge has a threshold (as known as *epistemic absolutism*), we are presented with a question: 'Where is the threshold for knowledge along the scale of justification (however

construed) or warrant or fallibility?’ This problem is extraordinarily troublesome. That is because, on the one hand, it would be counterintuitive to locate the putative threshold at the endpoints of the scale of justification/warrant/fallibility such as 0 justification (which means knowledge can be merely true belief) or 1 justification (which means infallibility). On the other hand, it would be arbitrary to choose a cut-off point that looks not as special as those endpoints (see [BonJour, 2010](#)). The same difficulty also applies to the distinction problem concerning relearning and remembering. We have seen that it would be counterintuitive to locate the putative threshold at endpoints such as zero contribution or 100 per cent dependence. Meanwhile, it would seem to be arbitrary to pick out any point in between and claim that it is the cut-off point that makes all the difference.

External epistemic gradualism can arguably *resolve* this threshold problem bedeviling epistemic absolutists. It argues that there is no such threshold distinguishing knowledge from anything that falls lack of. Instead, the distinction between knowledge and non-knowledge is gradational just like the distinction between yellow and red. It is hard, or even maybe misleading, to ask for a specific shade of colour and say ‘this is the cut-off point between yellow and red’. This is not the appropriate way to understand a spectrum. Similarly, what we should really care about is not ‘whether the subject in this case knows or not’, but ‘to what degree the subject knows’ or ‘how well the subject knows’.

Of course, this is not to say that any epistemic status can be recognised as knowing no matter how badly justified it is. Analogously, to claim that there is no clear threshold between yellow and red is not to claim that any shade of colour can be red or yellow. We can still look for some paradigmatic cases of red and yellow. Similarly, we can also have some paradigmatic cases of non-knowledge (e.g., Gettier-ed beliefs or even false beliefs) and knowledge (e.g., infallible knowledge, fundamental everyday knowledge), and then assess the graded membership of a given case *qua* a case of knowledge in terms of its difference between those paradigmatic cases.¹¹ In the same vein, we can have some paradigmatic cases of relearning (e.g., cases of complete prompting, or when the subject makes zero content contribution), but this does not mean that we have to designate them as the threshold.

Also, this is not to say that I think remembering is a kind of knowing and hence it should be as gradable as knowing is. Nothing in my argument here hinges on endorsing this epistemic conception of memory ([Lai, 2022a](#); for criticisms of this conception, see [Lai, 2022b](#)). My point in alluding to epistemic gradualism is just to show how a similar gradualist solution can be applied to *the gradability problem* introduced in the previous section. My gradualist solution to the gradability problem is simple: The distinction between the two concepts is not an absolute yes-or-no affair, but a matter of degrees. Hence, we should not look for a specific degree of forgetting/dependence/contribution that serves as a threshold distinguishing relearning from remembering. The distinction between the two processes is gra-

¹¹ For more details, see [Lai \(2022a\)](#).

dational just like forgetting, dependence, and contribution are. In borderline cases like Mild Otto, we should not persist in asking whether he relearns or remembers. With the gradualist solution in play, we can grant that Mild Otto is both relearning and remembering.¹² A more philosophically interesting question that we should care about is to which degree he is relearning or remembering. This question can be answered in terms of the degree to which he forgets his past experiences, to which his retrieved representation depends on his notebook, and to which he makes contributions to the content of his retrieved representations.

A gradualist solution to *the extended memory problem* can also be defended. In most cases of extended memory, such as Mild Otto and lifeloggers using SenseCams, gradualists can gladly admit them as both remembering and relearning. Correspondingly, their memory processes are indeed extended, as long as there is still memory residue regarding target events available for them when they are prompted by external resources. The original case of Otto might be trickier, as it seems like we can read it as a case of complete prompting. However, it does not need to be read like this. After all, if there is completely no memory residue regarding the museum available for Otto before he consults his notebook, then it is hard to envisage how he would have the feeling of 'being prompted' and how his representations can have the phenomenal characteristics of remembering. If Otto does not have the phenomenal feeling of remembering, then this gives us stronger motivation for denying that his memory process is extended—and I doubt whether this would be the reading preferred by Clark and Chalmer. Alternatively, if Otto does have memory residue (arguably, he at least still remembers that he recorded location information about the museum in the notebook) and thus feels like being prompted rather than learning something completely new, then our gradualist solution can, again, recognize Otto as both relearning and remembering.

As for the psychological classification problem, my gradualist solution can also do a better job in reconciling our philosophical understanding of the relation between relearning and remembering with that of psychologists. As opposed to those existing proposals, my gradualist proposal does not see remembering and relearning as two qualitatively distinct cognitive processes. Instead, their distinction comes in the form of a continuum or a spectrum. Accordingly, we can better explain why relearning can be seen as a component of remembering or a way of

¹² Some causalists might reject gradualism by appealing to the intuition that remembering and relearning are incompatible. My responses are: First, by assuming that remembering and relearning are incompatible, it is assumed that their distinction is non-gradational but clear-cut, and this is begging the question. Second, as we have seen before, the intuition that remembering and relearning are incompatible will give rise to the three puzzling problems. This provides motivations for abandoning the incompatibility intuition. Third, gradualists might not favour expressions like 'remembering and relearning are compatible', as it is somewhat ambiguous and misleading. The distinction between red and orange are gradational, but it might still sound odd to say that 'red and orange are compatible'. Rather, what gradualism emphasises is that there are many borderline cases where we should stop asking whether the subject is remembering or relearning, but ask to what degree the subject is remembering/relearning. Thanks to an anonymous reviewer for raising this objection.

measuring memory. In most cases, we can be both remembering and relearning, and we use relearning as a way of retrieving some partially or even largely forgotten past events. If that is the case, then we can also explain why relearning can be used to measure memory—in general, the more memory residues are available, the quicker the processing of information relearned can be. Admittedly, I do not want to pretend to have proposed a philosophical understanding that has absolutely no asymmetry between psychologists' understandings. Partially, this is because, as we have seen, psychologists do not share the same understanding of the relation between relearning and remembering. Another reason is, it might still be argued that when complete prompting is involved, the gradualist solution seems to also have to admit that the subject is only relearning rather than remembering. It is unclear to me whether this constitutes an asymmetry that we should worry about. That is because it is unclear, from the perspective of psychology, whether one can be seen as merely retrieving without thereby successfully remembering. It strikes me that one can arguably only complete a sub-process of remembering without completing the whole process of remembering. In this case, one is only relearning rather than remembering. However, perhaps there will be different perspectives, and I shall keep an open mind to these. What I would like to emphasize here is that even if there remains something asymmetrical, my gradualist solution still does a better job in cohering with our best memory science because it at least opens room for the reconciliation of remembering and relearning, instead of insisting that they are two qualitatively distinct processes.

5 Concluding remarks

Relearning and remembering are usually seen as two qualitatively distinct processes by philosophers of memory, and this gives rise to several puzzling problems. In this paper, I have addressed two important problems concerning the two processes: the memory error problem and the distinction problem. It has been argued that relearning is sometimes a memory error, provided that relearning can be falsidical and source monitoring error is a kind of memory error. I have also proposed a gradualist reading of the distinction between relearning and remembering, according to which the distinction is not an absolute yes-or-no affair but a matter of degrees. This gradualist solution enjoys advantages in accommodating the psychological classification problem, the extended memory problem, and the gradability problem.

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