

5 The Roots of Remembering

Radically Enactive Recollecting

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Our understanding of what lies at the roots of remembering needs to evolve. Recent years have witnessed some daring new thinking about this topic in response to empirical findings from three main sources. Two of these sources paint a picture of remembering as transactional and extraindividual, on the one hand, and reconstructive and re-creative, on the other. The third set of findings challenge standard assumptions about the fundamentally representational character of remembering.

Going wide, a body of empirical work shows that—at least sometimes—successful acts of remembering require heavy scaffolding by the environment or by other individuals (Ren & Argote, 2011; Sparrow, Liu, & Wegner, 2011). For example, there are well-documented cases in which interactions between romantic partners enable couples to remember things together that, as individuals, they cannot (Wegner, Erber, & Raymond, 1991). Such findings have inspired the idea that remembering can be a widely distributed and interactive process that draws on extraindividual resources. In this vein, there has been an explosion of theoretical work that seeks to recast how we conceive of remembering in extended cognition terms (Sutton et al., 2010; Tollefsen, Dale, & Paxton, 2013; Kirchhoff, 2016; Huebner, 2016; Heersmink, 2017a, 2017b). No doubt, these intellectual efforts are, as Skorburg (2017) observes, spurred on by the fact that transactional remembering is “low-hanging fruit for extended cognition theorists” (p. 473).

Looking inward, dramatic new proposals about memory ask us to reconceive what goes on in the heads of individuals when they remember. Novel scientific investigations concerning mental time travel have repeatedly confirmed the existence of strong similarities in the patterns of neural activity that enable us to recall past happenings and those that enable us to imagine possible futures. There is convincing empirical support that acts of memory and acts of imagining have a common basis (Szpunar, Watson, & McDermott, 2007; Schacter et al. 2007; Schacter & Addis, 2009; Mullally & Maguire, 2014). These findings encourage some theorists to propose that remembering and imagining are either identical or at least intimately related. Accordingly, remembering is deemed to be fundamentally

creative, imaginative, and dynamic in character (Michaelian, 2016; Clark, 2016). Remembering thus conceived is not a matter of passive recollection, as some traditional cognitivist theories would have it.

Relatedly, a wealth of empirical findings has put pressure on the traditional assumption that the primary function of remembering is to accurately represent past happenings. Against the idea that acts of memory involve the straightforward recovery or replay of past experiences, it has been shown that we shift between field and observer perspectives during recall (Nigro & Neisser, 1983). Against the idea that our memories are built for accuracy, what we remember is usually riddled with distortions. We regularly experience telescoping effects such that recent events are perceived as occurring in the more distant past than they did and *vice versa*, of more distantly occurring events being perceived as being more recent than they were (Neter & Waksberg, 1964; Thompson et al., 1996; Janssen et al., 2006). Also, we typically extend the boundary of scenes. For example, we remember more of the spatial boundary of a visual scene than was actually experienced (Intraub & Richardson, 1989). Finally, it is well known that memories can be easily and significantly corrupted or wholly implanted by various means (Loftus, Miller, & Burns, 1978; Loftus & Pickrell, 1995; Roediger and McDermott, 1995; Garry et al. 1996; Wade et al. 2002; Lindsay et al. 2004; Loftus, 2005).

All told, these combined scientific findings demonstrate that our natural memory capacities are fragile, easily open to outside influence and ill-suited to reliably reproduce undistorted, accurate representations. The amassed empirical evidence reveals that we get by when remembering in everyday contexts, doing well enough, without having to accurately represent past happenings. Indeed, stressing this, De Brigard (2014) concludes that, in the end, “it is a mistake to think of memory as [a] system that is uniquely—or even primarily—dedicated to reproducing the contents of previous experiences” (p. 177).

We propose an enactivist account of remembering that casts it as creative, dynamic, and wide-reaching. Such an account can more easily accommodate the aforementioned empirical findings than cognitivist accounts that conceive of remembering as always involving passive recollections that occur wholly and solely inside heads. According to our enactivist proposal, the roots of remembering can be understood in line with the Equal Partner Principle that holds that invoking neural, bodily, and environmental factors can all make equally important contributions when it comes to explaining and characterizing cognitive activity.

Augmenting this proposal, pivotally, it is argued that we achieve a stronger and more elegant account of the basis of remembering by going *radically* enactivist—viz., by abandoning the widely held assumption that remembering always and everywhere involves the retrieval of stored information or content in order to represent past events.

Seeking to understand the roots of remembering in a radical, content-free way is independently motivated by the fact that, should such an approach

to memory prove tenable, it would avoid seemingly intractable theoretical problems that arise when we try to account for information, content, and their causal powers within a naturalistic framework.

We currently lack workable naturalistic theories of information and content that would allow us to explain how information gets encoded, processed, and retrieved in order to generate remembered contents. As such we are motivated to explore and develop an alternative—extensively enactive—characterization of the roots of remembering that makes no such commitments.

The action of the chapter is as follows. Section 1 reviews a range of competing theoretical proposals about the nature of the contributions that individual and supra-individual resources make to everyday acts of remembering. We demonstrate that whatever stance is taken on the extended memory debate, the common denominator in all of the standard offerings is endorsement of the thesis that remembering necessarily involves having access to remembered content of some kind.

In Section 2, we propose an enactive account of the roots of remembering that surrenders this Remembered Content Assumption, or RCA. We propose an enactive alternative that can explain even semantically rich forms of memory retrieval in an empirically adequate manner, while avoiding the deep theoretical problems of accounting for the relevant notions of information and content naturalistically. We demonstrate these attractive features of our radically enactive account of remembering, showing how it is able to successfully handle classic cases from the extended mind literature.

Section 3 demonstrates that a radically enactive memory account also has the resources to explain individuals' on-board, experientially rich forms of episodic memory. Even on the assumption that episodic memories take the form of or strongly depend on dynamic, re-creative acts of simulative imagining, we argue that such imaginings themselves are not best understood as inherently contentful nor are they best explained by the recovery of remembered content.

We conclude, in Section 4, that a radical enactive account of memory is able to understand the roots of remembering—even its dynamic and reconstructing character—in terms of on-board biological capacities that are sometimes supported by environmental and social resources, without assuming access to or retrieval of content plays any part in this process.

1 Remembered Contents and Questions of Extended Memory

There is an important assumption that goes unquestioned in much contemporary theorizing about memory: it is that acts of remembering primarily involve access to and recovery of content of some kind. Call this the Remembered Content Assumption, or RCA. The RCA is foundational in prominent debates about how to characterize the type of contribution that

external resources make in enabling everyday acts of recall. This is because the RCA supports a second important assumption: call it the Contentful Contribution Assumption, or CCA. According to the CCA, the contributions that external resources make to cognitive processes only count as cognitive contributions if they are informational or contentful contributions.¹

Deciding whether external resources satisfy the criterion set out in the CCA has occupied the attention for those on both sides of the extended memory issue. For example, internalists who are skeptical of the very idea of extended memory wear their commitment to RCA and CCA on their theoretical sleeves. Pivotaly, attempting to draw a familiar distinction, they insist that the use of external resources, even if crucial for completing certain memory tasks, can make only causal, and not properly cognitive, contributions to the process of remembering.

The standard way internalists attempt to draw the line between merely causal and properly cognitive contributions is to appeal to the further distinction between intrinsic and derived content. The former is thought to be a feature of certain kinds of mental states, where such mental states are taken to be the ultimate and original source of any and all content. The latter is borrowed from such mental states and assigned to artifacts such as “traffic lights, gas gauges and flags” (Aizawa & Adams, 2005, p. 662). Accordingly, any properly cognitive contributions are isolated to and “constituted by certain sorts of causal processes that involve nonderived content” (Adams & Aizawa, 2010, p. 68).

Consequently, any content that an external resource—say, a repository, such as a notebook—may be said to bear could, at best, be derived content. Taking this internalist ruling at its word raises the question of whether it makes sense to think of external resources as literally containing, or really being imbued with, any kind of content of their own. Certainly, external resources—so conceived—even if they are not simply dead signs, can make no contentful contribution to remembering that is independent of the memorizer. Hence such resources can add nothing cognitive into the memory mix, since the resources themselves are only assigned content by beings with contentful mental states.

Clark and Chalmers (1998) provide a philosophically famous thought experiment that compares the cognitive feats of Inga, who relies on her on-board biological capacities in order to remember, and Otto, an Alzheimer’s sufferer who relies on an external notebook in order to do so. Internalists deny Otto’s notebook makes a cognitive contribution because it lacks content of the right kind. The chief spokespersons for this view, Adams and Aizawa (2001), hold that the crucial difference is that only biological brains have nonderived content whereas the symbols of Otto’s notebook have merely derived content. For this reason, they conclude that Otto’s accessing of the content of his notes is a noncognitive process and that the content of his notes do not “*constitute beliefs or memories*” (p. 55, emphasis added, see also Adams & Aizawa, 2010, p. 70).

External aids, on this view, help individuals to recover whatever contents their native biological memories are already assumed to have. Hence, use of external supports would at best instrumentally aid individuals' capacities for recall of relevant events or facts, by helping them to construct the content of their memories rather than actually contributing any content to this process.

Going the opposite way on this issue, the exciting idea that launched a thousand papers on the extended mind hypothesis is precisely that, sometimes, memories can be found outside of people's heads. Or more precisely, those attracted to the original, first wave version of the extended mind hypothesis assume that the information that constitutes beliefs relevant to our memories is normally located somewhere within our biological brains. But such information need not be, and in fact is not always, internally located.

On this way of understanding what is essential for having a memory it is possible to imagine, for example, that the informational content of a memory might be located either in, say, one's hippocampus or possibly in an artificial hard drive in one's head.² It is but a short step from this assumption to the idea that the content of one's memory could also be externally located, say, in a hard drive outside of one's head.

This is precisely what is being assumed when, in making their classic comparison, Clark and Chalmers (1998) tell us that Otto's notebook and Inga's hippocampus play the same roles in their respective rememberings. On their account, "the information in the notebook functions just like the information constituting an ordinary non-occurrent belief; it just happens that this information lies beyond the skin" (Clark & Chalmers, 1998, p. 13, see Rowlands, 1999, p. 122, 142). Thus for Inga, the content of her "belief was sitting somewhere in memory waiting to be accessed" (Clark & Chalmers, 1998, p. 12). The difference is that the informational basis of Otto's belief resides in his notebook, not in his wetware. Thus, according to the original version of the parity principle, advanced by Clark and Chalmers, we ought to conclude that the information in Otto's notebook is part of his extended mind. This is because—on this way of telling the story—the information in Otto's notebook functions in the same way as the information in Inga's brain does in their respective acts of remembering.

Thus, in advancing their classic, first wave argument for the extended mind thesis, Clark and Chalmers (1998) present an objectified account of the contents of memory, according to which remembered contents are conceived of as accessible, objective commodities (see Loader, 2013, p. 167). Indeed, it is precisely because these first wave extended mind theorists have a commodity conception of the contents of biological memory that the idea of transposing the content of memories to external artifacts is such "an easy move for them" (Loader, 2013, p. 177).

The RCA and associated idea that memories have locatable contents is so familiar in the analytic tradition as to go unquestioned, even by those who deny the CCA. Thus new school internalists—those who defend the

idea that only that which is within occurrent consciousness properly counts as mental—do not bat an eye at the possibility that memory contents might be located outside the head (Gertler, 2007). Defenders of the idea that consciousness is what really matters for mentality do not take a stand on whether contents of memories are located internally or externally. For in their view, what really matters to mentality is only whether or not one actively and consciously entertains such contents, not the location of such contents. Thus, on this way of construing things, “Otto would . . . only have the content that MoMA is on 53rd Street ‘in mind’ when he reads his notebook and consciously entertains it” (Coleman, 2011, p. 105).

Setting out from the idea that conscious activity is all that matters to mindedness, Coleman (2011) offers a different parity principle—which states: “If, as we confront some task, a part of the head functions as a process which, were it to go on in the world, we would have no hesitation in rejecting as part of the cognitive/mental process, then that part of the head is (for that time) not part of the cognitive/mental process” (p. 105). According to Coleman’s (2011) revised parity principle, it follows that any contents that we might imagine to be stored in organisms will not be part of cognitive processes on the assumption that we do regard any contents stored in the environment as part of cognitive processes. This will be so, in either case, whether they prove accessible to consciousness or not.

All in all, what the analysis of all three of these options reveals is that there is a pervasive tendency to assume a “reified conception of memory” (Loader, 2013, p. 170). As such, to think of information and content in this way encourages us to think of memory as a kind of storehouse: it treats the notions of information and content interchangeably and regards both as commodities to which we can have access.

Importantly, although they hold on to the idea that information and contents are stored, second wave extended mind theorists break faith with the idea that biological and external memory are alike in how they get their work done. Sutton (1998) warns against modeling the way brains store information on the way computers store information. The crucial difference is that nonbiological memory systems retain information statically such that it is “unchanged unless manipulated” (p. 4). In contrast, biological memory is fluid, reconstructive, and shifting (Sutton, 2010, p. 206).

Similarly, based on a wide-ranging review of the empirical literature, Michaelian (2012) argues that items stored in biological memory are unlike external records in that they are not discrete, stable items that are readily endorsed on retrieval. Forgetting is a feature, not a bug of biological memory. Hence, when it comes to understanding the dynamics of biological memory, Michaelian (2012) gives reasons for moving beyond the “simple, preservative picture,” adding that, “if memory is a container it is a rather leaky one” (p. 1156).

Bearing these considerations in mind, second wave extended mind theorists recognize that even though internal and external resources—engrams and

exograms—have vastly different properties and profiles, they can still cooperate because they can serve the same overall cognitive ends in enabling acts of remembering. Shifting the emphasis away from parity arguments, in line with this observation, second wave theorists instead aim to clarify what individual and external resources, respectively, bring to the table in acts of remembering.

Second wave theorists seek to understand how memories are constituted and sustained by the integration of complementary contributions of internal and external resources involving “patterns of information-sharing and transmission” (Barnier & Sutton, 2008, p. 178). Importantly, once again, for those who are attracted to this sort of view, talk of processed information is treated as interchangeable with talk of content.³

In line with the CCA, there can still be a definitively cognitive contribution to the overall process if, for example, the external resources make a contentful contribution, say, by filling in the ‘gaps’ in the contents of already, partially recovered memories (Barnier & Sutton, 2008, p. 179). Focusing on the case of collective remembering, Barnier and Sutton (2008) are interested in addressing the question: “how do groups operate to process information” (p. 179). Here they emphasize the need to look for complementary processes both within and across individuals, precisely because they see no good scientific reason to adopt either of two extremes: thinking of social factors as mere external triggers for internal acts of remembering or thinking of acts of remembering as occurring entirely extra-individually (p. 177). Thus, on their view, information is exchanged between individuals when memories are transactionally scaffolded by others.

Crucially, for second wave extended mind theorists, memory picks out a diverse set of “cognitive capacities by which we retain information and reconstruct past experiences, usually for present purposes” (Sutton, 2012).⁴ Thus despite Sutton’s warning about not modelling the human mind on computers, it is fair to say that the ‘archival caricature’ still captures something important at the heart of the way certain contemporary philosophers of mind and cognitive scientists understand memory.

Despite acknowledging that the putative informational contents of our memories are stored in quite different ways in biological memory as opposed to external devices, second wave extended mind theorists remain committed to the RCA. Thus, they remain committed to a content-based view of remembering to the extent that they assume that there are contents to be stored at all—viz. to the extent that they retain the idea that remembering essentially involves receiving, encoding, and retrieving stored contentful information about particular events or episodes.

Those anticipating a third wave of extended mind go a step further. Whereas second wave extended mind theorists understand the parity principle of the first wave as being a special case of complementarity between inner and outer resources (Sutton, 2010, p. 206), it is suggested

that the third wave might altogether do away with “distinct inner and outer realms of engrams and exograms” (p. 213). Consequently, it is imagined that there could be a “deterritorialized cognitive science which deals with the propagation of deformed and reformatted representations, and which dissolves individuals into peculiar loci of coordination and coalescence among multiple structured media” (p. 213).

Although third wave extended mind theorists are prepared to imagine a more fluid and dynamic vision of cognitive science, as Sutton’s (2010) talk of creatively constructed representations reveals, it would seem that even such a dramatic shift in thinking would still retain the fundamental idea of RCA—namely, that memory depends upon manipulation of content of some kind.

2 Extensively Enactive Remembering

A more daring move, in thinking about what and how individual and supra-individual resources contribute to acts of remembering, is to abandon the RCA—at least in thinking about basic memory processes—and to let go of the idea that such processes necessarily involve the production, sharing, and transmission of any contents whatsoever. The more radical forms of extensive enactivism propose just such a rethink of the nature of the most basic biological forms of individual memory and how they combine with external resources to enable many mundane acts of recall.

Radical enactivists about memory agree with internalists in holding that there is no informational content literally contained in Otto’s notebook that is accessed by him when he remembers. Yet, unlike most other theorists, they also deny that Inga’s biological brain is an interestingly different position. Radical enactivists pronounce a plague on both of these RCA houses: That is their version of parity.

Fundamentally, radical enactivists hold that the activity of remembering is not best understood in terms of the retrieval of remembered contents (see Loader, 2013; Hutto & Myin, 2017). Taking a radical line, enactivists of this stripe hold that memories come into being “on the spot” during acts of recall while abandoning the idea that “ongoing behaviour in such cases is explained by appeal to identifiable inner content bearers” (Clark, 1998, p. 100). Going the radically enactivist way is to conceive of remembering as a matter of ‘on-the-fly’ construction that can be grounded in structural synaptic changes in the brain as well as other structural changes in the environment without assuming the existence of stored and retrieved contents.

Scientific research on memory is rife with talk of “memory traces,” of “encoded and retrieved information,” and of “the storage and retrieval of information and representations.” Despite the popularity of this talk and associated metaphors, close inspection of how these notions operate in science reveals them to have serious limitations—limitations that make them

prime candidates for theoretical explication or elimination (see Roediger, 1980). As De Brigard (2014) observes:

“Storing” is a rather misleading term. What seems to occur when we encode information is the strengthening of neural connections due to the co-activation of different regions of the brain, particularly in the sensory cortices, the medial temporal lobe, the superior parietal cortex, and the lateral prefrontal cortex. During encoding, each of these regions performs a different function depending on the moment in which the information gets processed. A memory trace is the dispositional property these regions have to re-activate, when triggered by the right cue, in roughly the same pattern of activation they underwent during encoding. (p. 169)

Radical enactivists assume that De Brigard’s analysis is mostly correct, modulo any residual commitment in the previous claims that information or content is actually encoded and processed. Rather, radicals seek to explain basic forms of learning and memory entirely in terms of re-enacted know-how.

Focusing solely on the simpler kinds of procedural memory widespread in the animal kingdom, remembering can be understood as the capacity to re-enact embodied procedures—often prompted and supported by patterns of response that are triggered by external phenomena.

Memory of this sort entails knowing what to do in familiar circumstances. It is surely not necessary to posit stored mental contents in order to explain the dispositional basis of such capacities (Ramsey, 2007, Chapter 5). The brain’s underlying contribution to such capacities “turns out to be just a matter of either organizing extant synaptic circuits in new wiring patterns or switching on genes in neurons that produce new synapses. . . . The brain does everything without thinking about anything at all” (Rosenberg, 2014, pp. 26–27).

Importantly, purely embodied know-how is not grounded in or mediated by any kind of stored information or knowledge; rather it can be understood as the overall responsiveness of a complex system as shaped through habit and past experience (Barandiaran and Di Paolo, 2014).

This radically enactive account of basic memory can be provided, without gaps, so long as no appeal is made to the encoding and processing of information or representations. Radically enactive accounts of memory suspect that an information-processing story adds nothing of explanatory value to our understanding of how experience modulates neural connections and weights that support acts of remembering. If they are right, appeals to stored information, however popular, are superfluous.

Moreover, not only is it questionable whether talk of stored information and retrieved content adds any explanatory value, it is difficult to understand—ultimately—how such explanations would go even if it was thought that they are needed.

Here it is important to acknowledge a deep theoretical problem—which Hutto and Myin (2013) dub the Hard Problem of Content, or HPC. The HPC highlights a problem in making easy appeal to the idea that brains somehow literally process and store informational or other kinds of remembered content. The HPC arises from the fact that the notion of information that can be most easily called on to do serious explanatory work in the sciences of the mind—a notion that might possibly fill in the scientifically respectable details of the information processing story—is the notion of information-as-covariance. According to that notion of information, a state-of-affairs is said to carry information about another state-of-affairs if and only if it lawfully covaries with that other state-of-affairs, to some specified degree. The parade example is that of the age of a tree covarying with the number of its rings. Information in this sense is a perfectly objective and utterly ubiquitous commodity—it literally litters the streets. Moreover, this notion of information has impeccable naturalistic credentials: it is used in many sciences. Thus, it can clearly serve the needs of a cognitive science with explanatorily naturalistic ambitions.

Yet cognitivists face a dilemma if they try to tell the story of remembered contents using a naturalistically respectable notion of information. They might, on the one hand, opt for an information-as-covariance notion, or, on the other, they might try to call on some other naturalistic notion of information to understand memory in terms of content encoding and information processing. Going either way has its problems.

In dealing with the first horn of the dilemma, they can try to give a naturalistically respectable explanation of information encoding and processing by appeal to the notion of information-as-covariance. Yet if that is the only notion of information in play in cognitivist theorizing about remembering, then it is difficult to understand what it could possibly mean for information to be literally encoded. How can relations that hold between covarying states of affairs be literally “extracted” and “picked up” from the environment so as to be “encoded” within minds?

Perhaps it will be objected that what should be focused on here is not the medium but the message. Sometimes the story about remembered contents is told in quasi-communicative terms of signaling and receiving messages. Yet how seriously should we take these analogies and the talk of encoding and decoding “messages” in the brain?

Once again there are grounds for caution. Despite the widespread popularity of talk of encoded signals and messages, attempts to seriously explicate the nature of neural or mental “codes” and their alleged encoded content are few and far between. Goldman (2012, p. 73) gives a frank appraisal of the current situation: “There is no generally accepted treatment of what it is to be . . . a mental code, and little if anything has been written about the criteria of sameness or difference for such codes. Nonetheless, it’s a very appealing idea, to which many cognitive scientists subscribe.”

Even more worryingly, how should we understand the nature and source of any such putatively contentful messages? As information-as-covariance is not to be understood as the transmission of information from one system to another, this notion is surely not able to help us to understand how sense perception supplies the mind with contentful messages—messages that supply contents that can be encoded and decoded by biological brains. At any rate, as things currently stand, we lack a naturalistic theory of content to provide us with a substantive explanatory account of how to understand what contents are or how they might be stored and retrieved.

Can cognitivists deal more successfully with the second horn of the dilemma? They might try to call on some other naturalistically respectable notion of information that will enable them to tell content encoding and processing stories in full detail. Telling those tales in a different way requires identifying an alternative notion of information with sound naturalistic credentials that can do the relevant explanatory heavy lifting. Yet, at least as things currently stand, it is unclear if there is an alternative, scientifically respectable notion of information available has the right characteristics to do such explanatory work.

In light of this analysis, it becomes clear that the “storage” metaphor is not the only, or even the most, problematic card in the cognitivist deck, *pace* De Brigard (2014). The very idea that remembered contents might reside in biological brains invokes quite serious scientific mysteries. Such mysteries arise for anyone who takes seriously the idea that information is some kind of accessible, content-bearing commodity. These mysteries want dispelling, one way or another—they want explaining or explaining away.

Yet what is the alternative? One possibility is that “memory might not be a store at all, and that remembering might be active in a stronger sense than a reconstructive account of memory by itself allows—i.e., that it might be fruitfully understood as a type of action” (Loader, 2013, p. 173). A radically enactive take on memory “would focus not on access to the contents of a store but on remembering as a type of action” (Loader, 2013, p. 168). As Loader (2013) observes, an enactive account of memory is one that, following an attempted pattern of explanation used for understanding a range of other cognitive phenomena, eschews “representation in favour of action” (p. 175).⁵

The core idea of an enactivist account of memory, so construed, is captured in the slogans advanced by Stern (1991)—“memory is an ability to think and act in certain ways” (p. 203)—and Neisser (1996)—“remembering is a kind of doing” (p. 203). Indeed, the elements of the enactive view can be found in a number of accounts of memory: those “which reject representationalism (e.g., Ryle, 1949; Malcolm, 1977; Wittgenstein, 1967; Stern, 1991; Neisser, 1996; Shanon, 1998) and those which emphasize the active nature of memory in ways which go beyond mere reconstructivism (Stern, 1991; Neisser, 1996; Toth & Hunt, 1999)” (Loader, 2013, p. 174).

Procedural memory—remembering how to execute certain types of action—lends itself to a radically enactive treatment. This is because

remembering of the procedural kind requires nothing more than reinitiating a familiar pattern of prompted response, albeit with adjustments that are dynamically sensitive to changes in circumstance and context (Sutton & Williamson, 2014).

Pivotal, for our purposes, purely embodied acts of remembering are marked by the fact that they do not require representing any specific past happening or happenings, and especially not representing these *as* past happenings. Remembering of this sort can be best characterized as enactive precisely because it is a matter of re-enactment that does not involve representation (Casey, 1987). Embodied or enactive forms of remembering, as exemplified by procedural memory, do “not store representations of external states of the world” (Schacter & Tulving, 1994, p. 26, see also Michaelian, 2016, p. 26*ff.*).

Yet even though we should not expect a contentless account of enactive memory to explain all features of every kind of remembering, if the approach is to be explanatorily interesting it would need to apply go beyond providing an account of procedural memory only. For, as Loader (2013) recognizes, there would be nothing “particularly surprising or useful in baptising procedural memory only as ‘enactive’” (p. 174).

There are sophisticated, situated forms of remembering involving semantic recall that can be adequately explained in terms of individuals directly interacting with environmental resources, without assuming the need for their accessing remembered contents.

Take Otto, for example. He is clearly capable of forming contentful beliefs about the world. The reminders penned in his notebook prompt him to judge—reliably and correctly—that the MoMA is on 53rd Street. This is so even though it is not plausible that he is retrieving that remembered content from either the notebook itself—as it only contains pen marks—or from his degraded biological memory. The point is that in Otto’s case an appropriate content is reliably formed—he forms an accurate semantic memory about a particular place. This is a declarative, not just a procedural memory, but arguably, the content of Otto’s memory is not accessed or recovered from any kind of memory store.

Or take another case that has impressed second wave extended mind theorists. Tribble (2005) offers an insightful account of how Shakespearean actors in Elizabethan and Jacobean times used their theatre environment to augment and support their biological memories. Their memory tasks could be formidable: some leading actors “had to secure and retain command of about seventy-one different roles, of which number fifty-two or fifty-three were newly learned” (Beckerman, 1962, p. 9, as cited by Tribble, 2005, p. 136).

On Tribble’s (2005) analysis, the actors managed to remember their lines and parts by making special use of “immediate physical and social resources outside the person” (p. 140). Part of her explanation for their incredible memory feats is the fact that they relied on plots—folio-sized sheets of paper containing specific instructions on when and where to enter and exit, and

sound and music cues (p. 144). Yet even though these devices would have helped the actors grasp the large, skeletal action of the play—the ebb and flow of the scenes—they were “impossibly scanty. . . [containing] only the barest of cues, sometimes just a word or two” (p. 151). As such, the actors would have used well-rehearsed techniques of rote memory and the hooks provided by iambic pentameter, in conjunction with other cues and prompts, given by both the other actors and the structure of the playhouse to produce their performances.

In sum, they actively used their environment so as to ‘under-load’ their memories. The answer then, according to Tribble (2005, p. 151), lies in the actors exploiting opportunities for stripping away any “superfluous information” and off-loading “information” into the ambient environmental and social structures: the playhouse itself and other players.

Tribble and others attempt to explain these memory feats in terms of offloading information, but the details of this part of their explanation are brief and unclear. Which information, exactly, would have been off-loaded? How is this achieved? And once off-loaded, how does the informational content make a difference to the acts of remembering? A simpler and sufficient explanation is that the actors, through repeated practice in their particular environments, were able to use individual techniques, supported by resources in the environment, including one another, in order to reliably generate their performances. Once again, even though this complex activity does not reduce to mere procedural remembering, accessing remembered contents need play no part in explaining how the actors manage to generate their familiar pattern of lines.

Perhaps it will be conceded that access to, or the processing of, contents need play no part in explaining the acts of remembering that typify how Otto uses his notebook or how Shakespearean players used local cues to remember their lines while walking the boards. Still, it might be thought that even if radically enactive accounts can handle such cases of nonprocedural remembering, they cannot go further.

Hence, it might be conceded that radical enactivists can explain the kinds of remembering that are environmentally and socially scaffolded—those that are driven by direct engagement with external resources—without the need to posit stored and retrieved contents. Yet, even if this proves so, it might be thought that an enactive account of memory is still unable to tell the whole story of basic biological remembering. In particular, an enactive account may be deemed to lack the resources needed for explaining the sort of reconstructive imaginative acts that constitute experientially rich episodic forms of remembering. For many, it is difficult to imagine such a possibility.

3 Episodic Remembering as Enactive Imagining

A growing number of theorists have proposed that episodic remembering centrally involves or just simply is a form of re-creative or simulative

imagining—a kind of imagining that enables us to construct and entertain possible episodes that may have occurred (Gerrans & Kennett, 2010, De Brigard, 2014, Michaelian, 2016). The assumption here is that episodic memory, here, “refers, roughly, to the form of memory responsible for allowing us to revisit specific episodes or events from the personal past” (Michaelian, 2016, p. 5).

Crucially, the kind of recollective recall associated with episodic memory is taken to be essentially experiential in character; it has a distinctive phenomenology (Debus, 2008, pp. 407–408).⁶ Many in the field assume that such episodic experiences are inherently representational. Bernecker (2010) exemplifies:

Experiential memory has two characteristics. First, one can experientially remember only what one has personally experienced. Experiential memory is restricted to cases in which *the claim* to remember something incorporates *the claim* to have experienced it for oneself. Second, *experiential memory represents the remembered content* from the first-person perspective—from ‘within’—and involves qualitative experiences (qualia) and imagery. Experiential memory consists in the evocation of parts of the original experience in imagination, allowing one to relive or re-experience the original situation and going over what it was like . . . To experientially remember something one must not only remember what happened but also remember what it was like.

(pp. 13–14, final emphases added)

As the previous passage highlights, when we consider cases of episodic remembering in adult humans it can seem as if representational content is somehow built into re-lived experiences. This is because, inevitably, in reflecting on such cases we contentfully represent and make claims about those relived experiences. Arguably, in general, the phenomenal character and representational content can, and sometimes do, come apart (see Block, 1990, Hutto, 2009). If we assume that this sort of separation can occur in episodic remembering then it follows that the phenomenal character of episodic remembering does not, by itself, entail or suffice for any representational content that may be connected with acts of episodic remembering. Indeed, being able to make claims about one’s personal past—to have a truth-conditional take on it, as in cases of autobiographical memory that are distinguished from instances of pure forms episodic memory—is a special achievement, requiring the acquisition of additional cognitive machinery (Hutto, 2017). In particular, to make claims with truth conditional content requires the mastery of distinctive sociocultural practices (Hutto & Satne, 2015; Hutto & Myin, 2017).

It might be thought that if episodic memory just is, or centrally involves, simulative imagining then it must be representational. This line of reasoning can seem compelling since imagining, by its very nature, deals with presence

in absence. If all imagining is necessarily representational then defeat for radically enactive accounts of imagination and memory follows briskly. However, on close inspection, there are strong reasons to doubt that basic forms of sensory imagination actually are, or even could be, representational (Medina, 2013; Hutto, 2015).

A major reason for doubting that simulative imaginings are representational *at all* is that unlike other familiar cognitive attitudes—such as beliefs and desires—they appear to lack any inherent correctness or congruence conditions. For example, as Gerrans (2014) maintains, “*qua* simulations imaginative states do not have congruence conditions” (p. 105, see also p. 18). Or as Langland-Hassan (2015) tells us, “Much of what has been said about sensory imagination conflicts with the idea that imaginings have substantive correctness (or veridicality, or accuracy) conditions at all” (p. 665).

Turning the tables on the usual line of argument, if it turns out that imaginings lack any kind of correctness conditions essentially, then we have grounds for thinking that pure forms of episodic remembering are necessarily not content-involving. This is because—at least in the analytic tradition—having some kind of correctness conditions is taken to be a necessary condition for being in a state of mind with representational content. We will not attempt to settle these important debates about the nature of sensory imaginings here. It suffices for our purposes to note that whatever their ultimate outcome, it is surely conceptually possible that imaginings, though they make a cognitive difference, not only lack the sort of content enjoyed by other canonical mental attitudes, but lack any kind of content whatsoever.

Still, even if this is accepted, it might be thought that episodic remembering is content-involving in a different way and for a different reason. Coming at the question from the bottom up, so to speak, it might be held that imaginative simulation—even if it is not inherently contentful in character in-and-of-itself—nevertheless depends on and is best explained in terms of so-called subpersonal processes that involve the acquisition, storage, and processing of informational contents.

For example, Michaelian (2016) holds that the best explanations of episodic remembering, understood as constructive and simulative, need to “assign an important role to information storage” (p. 8). By his lights, it is only by positing processes that access stored information that it is possible to explain how we imagine past episodes. Assuming tight links between remembering, imagining, and perceiving—in line with predictive processing accounts of these cognitive processes—it is assumed that what is cognized in such cases is a composite of content from multiple sources. Some content is taken to be supplied by low-level perceptual representations while other content is taken to be supplied by mental simulations, fueled in part by stored information.

Clark (2016) offers a similar account. Conceiving of perceiving, imagining, and remembering as a package deal, he offers us a similar prediction-based

account of episodic memory that freely employs talk of the mixing of high and low-level contents that stem from incoming information and stored representations (p. 102). Like Michaelian's (2016) characterization, Clark's account of episodic remembering is dripping in cognitivist assumptions and vocabulary.

Yet, despite the popularity of cognitivist characterizations of episodic rememberings, non-representational renderings are not only possible, they are arguably preferable. Why so?

Consider that with respect to procedural memory, there is nothing to declare and nothing that is declared. For this very reason, many are prepared to agree with radical enactivists that there is no explanatory gain in assuming that rules for the relevant procedures are somehow captured in information that is stored and encoded within cognitive systems (see Loader, 2013; Sutton & Williamson, 2014; Michaelian, 2016).

Still, some balk at thinking of declarative forms of memory—episodic and semantic—in the same vein. It is thought that the latter phenomenon somehow depends upon recovering information or content. Thus when we recall particular episodes in our lives or recall semantic facts we somehow retrieve information stored in memory traces, *making it available to the organism* again (see Michaelian, 2016, p. 26). Allegedly, stored information does special causal, explanatory work in declarative forms of remembering—work of a sort that there is simply no need for in nondeclarative forms of remembering. Illustrating this point by means of example, Michaelian (2016) tells us:

Declarative memories are *available to consciousness* and thus can affect the activities of other cognitive systems. I remember that it has been sunny every day for the past week; I infer that it will be sunny today; I therefore leave home without bringing an umbrella. *An appeal to stored information is essential* to the explanation of my behavior in this case, for the memory does not cause the behavior directly, but only via an intermediate process of reasoning. *Conscious access to stored contents* allows them to *enter into the causation of behavior* in various indirect ways, via reasoning, imagination, and other routes; if the subject were not to have such access, declarative memory would be unable to provide inputs to other cognitive processes. Thus, were we to suppose that declarative memory does not store information, we would be *unable to explain* certain modifications in the behavior of the organism.

(pp. 27–28, emphases added)

Here lie philosophical monsters. To tell this story in a fully naturalistic register would require not only dealing with the hard problem of content, but also the hard problem of consciousness, as well as the problem of mental causation. And despite what Michaelian (2016) implies in his chapter when

giving his modally ‘musty’ assessment, a content-involving story about the roots of remembering is not, in fact, the only possible explanation available.

Rather than consciously accessing the stored content “It has been sunny every day for the past week,” I perhaps form the judgment with that content on the basis of executing a few episodic simulations. I might re-enact something I was doing on each of the various days to reach a conclusion about the weather for the week. If so, so long as the set of simulations that ground such declarative remembering are not themselves content-involving, even though a contentful memory is formed, it will not have been formed by consciously accessing any stored contents. Episodic re-creative simulative imaginings could explain how we come to remember that it has been sunny every day for the past week without our having to posit any stored informational contents at all. And there seems to be no obvious reason why individual re-enactments themselves—even in full phenomenal glory—need involve the retrieval of any stored information.

This is the crux. Why should we assume that the brain must make information available to organisms in order to explain how simulation works in terms of re-creative re-enactment? There appears to be no more reason to assume that stored information and contents must play a part in simulatively re-enacting an experience than there is for thinking they need play a part in re-creating the repeated acts involved in procedural remembering.

Our recommendation is to think of episodic memory as strongly reconstructive (see Loader, 2013, p. 172). Radical enactivists see no reason at all to suppose that what lies at the roots of declarative memory differs from what lies at the roots of nondeclarative memory in this key respect. On the ground floor, neither form of memory gets its work done by making information or content stored in the brain available to the organism. If so, the capacities for experiential re-enactment—those that feature in pure episodic remembering and that are tied to be having certain kinds of phenomenal experience—need not make stored information available to the organism, as opposed to simply, partially re-creating patterns of activity in neural pathways in response to particular cues and prompts.

4 Conclusion

Taken together, the considerations in this chapter give us grounds for maintaining that the roots of remembering need not involve and may not be best explained in terms of storing and retrieving any kind of remembered contents. If the analyses of this chapter prove sound, this will be true not only of procedural forms of remembering, but also of sophisticated kinds of remembering that benefit from environmental and social scaffolding, as well as reconstructive forms of experientially rich episodic remembering. The account we propose indeed understands the relevant kinds of remembering as the contentless activity of enactively constructing memories using biological, environmental, and social resources.

We do not expect that this will be the last word on these issues. In particular, extended mind theorists (especially those arriving on third wave) and those who favor reconstructive accounts of episodic remembering may be able to marshal responses to the challenges raised previously. It will be interesting to see, in the long run, to what extent a commitment to contentful representations and information-processing needs to be retained in our best explanations of what lies at the roots of remembering. To the extent that the next wave of extended mind theorists opt for more bidirectional, dynamic, and interactive visions of what remembering involves, a further question will be to determine to what extent we will need to retain a commitment to a familiar functionalist framework for thinking about minds (see Hutto, Peeters, & Segundo-Ortin, 2017). Rethinking how we manage to think about the past may indeed help to radically shift how we think about thinking in the future.

Notes

- 1 Notably, a commitment to neither the RCA nor the CCA is necessary for extended mind theorists. They may choose, for example, to endorse a non-representationalist functionalism. Nevertheless, most extended mind theorists do, *de facto*, make both commitments. For a discussion of a related point see Wheeler (2017, p. 460).
- 2 Clark and Chalmers (1998) rarely mention content but instead talk of the beliefs that comprise the having of certain memories as being constituted by information. On the standard assumption that the beliefs relevant to having certain memories—e.g., the belief that MoMA is on 53rd Street—are contentful it follows that, for Clark and Chalmers, information is either interchangeable with or entails content on their analysis of extended minds. Thus, as Coleman (2011) observes, in their seminal paper Clark and Chalmers “compare the storage of endorsed content in a notebook with the storage of endorsed content in the cranial biological memory” (p. 101).
- 3 For example, Barnier and Sutton (2008) tell us that “Just as different forms of memory within the individual can *operate on the same information* as it is transformed or abstracted or conventionalized (Toth and Hunt, 1999), so the *same content* can be transmitted across individuals, with its fate shaped by the available social resources and dynamics (Sperber, 1996)” (p. 179, emphasis added).
- 4 In later writings Sutton restricts the need to use information to reconstruct past experience to declarative forms of episodic memory (see, e.g., Sutton and Williamson, 2014).
- 5 Any enactive account of memory that eschews the idea that memory is fundamentally in the business of accessing and manipulating representational or informational contents, would count as a radically enactive account of memory. Following Loader’s usage, we treat enactive of memory as co-extensive with radically enactive accounts of memory.
- 6 As Debus (2007) illustrates “when you remember the last dinner party you went to, you might have an experience as if seeing again the person who sat opposite at the dinner. Or you might have an experience as if hearing once more some particular sounds or noises—the sudden bang emanating from the kitchen at some point, or a new tune played toward the end of the party. Indeed, in an attempt to describe those occurrences, we might say that ‘you see the person again in front of your mind’s eye,’ that you can ‘hear the tune in your head,’ and so on for the other senses” (p. 175).

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