CHAPTER 6

INTEGRATING THE PHILOSOPHY AND PSYCHOLOGY OF MEMORY: TWO CASE STUDIES

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Memory is studied across a bewildering range of disciplines and subdisciplines in the neural, cognitive, and social sciences, and the term covers a wide range of related phenomena. In an integrative spirit, this chapter examines two case studies in memory research in which empirically-informed philosophy and philosophically-informed sciences of the mind can be mutually informative, such that the interaction between psychology and philosophy can open up new research problems—and set new challenges—for our understanding of certain aspects of memory. In each case, there is already enough interdisciplinary interaction on specific issues to give some confidence in the potential productivity of mutual exchange: but in each case, residual gulfs in research style and background assumptions remain to be addressed.

The two areas are the developmental psychology of autobiographical memory, and the study of shared memories and social memory phenomena. I show points of contact between a flourishing social-interactionist tradition in developmental psychology and one line of thought in recent philosophy of mind concerning memory, time, and causation; and, more briefly, I sketch a series of connected issues about memory in social psychology and the social sciences which have recently been brought into contact with theoretical ideas about distributed cognition and the "extended mind". These are, then, two focussed forays into a vast array of live topics for the cross-disciplinary study of memory over the next decade: I have offered broader surveys of the field elsewhere.[1] Just one further example of another, different area very much in need of cross-disciplinary integration is the study of habit memory and skill memory, where philosophers of cognitive science have been just beginning to catch up with the phenomenologists in looking to empirical work for mutual illumination.[2] Obviously there are other issues and other paths through related terrain, and readers should also pursue different integrative and constructive treatments, from both philosophical and psychological starting-points.[3]

One integrative role of philosophy in the cognitive sciences lies in the juxtaposition of related concepts and theoretical commitments from different branches of these sciences which have not yet been addressed together: this is not a negligible job, for increasing specialization in empirical fields brings the danger that scientists remain unaware of or misunderstand the relevance of work in neighbouring subdisciplines. But naturalistically oriented philosophers of cognitive

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science also have two more ambitious aims. They hope occasionally to play an active and constructive part in the integrative theory-construction which can result from such meetings of traditions and lines of research.[4] And they also rightly take it as their job to construct frameworks within the philosophy of science for making sense of interlevel and interfield relations, whether from a revised reductionist perspective[5] or with a focus on interfield integration.[6] A number of other conceptual issues in the psychology of memory would benefit from careful treatment in the philosophy of science: debates about the nature and psychological reality of distinct "memory systems",[7] for example, need to be connected with broader discussions of modularity and psychological kinds.

But although some of this work in the philosophy of science has taken the sciences of memory as an important test case,[8] philosophers have otherwise paid surprisingly little attention to empirical studies of memory. Despite the rich history of theorizing about the roles of memory and narrative in the construction and maintenance of personal identity, for example, only a few philosophers[9] have looked to the psychology of autobiographical memory for understanding of the constraints on our contact with the personal past. So in discussing the developmental psychology of autobiographical memory below, we cover one recent strand of the philosophy of mind, in work by John Campbell and by Christoph Hoerl and Teresa McCormack, in which questions about the emergence of memory in childhood have been asked. The two topics addressed in this chapter, then, are merely initial samples of the many memory-related projects waiting for naturalistically-inclined philosophers of mind.

1. DEVELOPMENT OF AUTOBIOGRAPHICAL MEMORY

Although children start talking about the past pretty much as soon as they start talking, their initial references are fleeting and fragmentary, and the richer capacity to refer to specific events in the personal past develops only gradually. For over a century, psychologists have wondered how this slow development of autobiographical memory is connected to the intriguing inability of most adults to remember many events or experiences from their early childhood in any kind of rich detail ("infantile amnesia").

So the explanatory target in the developmental psychology of autobiographical memory is the child's emerging ability to think about episodes and personal experiences at particular past times. This is more than the capacity to understand sequences of events or intervals between events, and more than general knowledge of how things usually go. While there are significant terminological and conceptual differences across traditions in this area, for present purposes we can treat the psychological labels "autobiographical memory" and "episodic memory" and the philosophical labels "personal memory" and "experiential memory" as all designating roughly the same relevant set of phenomena.[10] Endel Tulving's notion of "mental time travel" is useful in helping us initially hone in on our topic: when

we are engaged in this kind of remembering, we are not merely being influenced by our past, but are thinking about particular past experiences *as* past.[11]

Building on a 20-year tradition of social interactionist work in developmental psychology, Katherine Nelson and Robyn Fivush have proposed a social cultural developmental theory of autobiographical memory.[12] Their framework, with its Vygotskian and dynamicist inspirations,[13] offers a rich picture of multiply interactive developmental systems spanning the child's brain and local narrative environment. The emergence of autobiographical memory in childhood is

> the outcome of a social cultural cognitive *system*, wherein different components are being opened to experiences over time, wherein experiences vary over time and context, and wherein individual histories determine how social and cognitive sources are combined in varying ways.[14]

The direction of influence, in some presentations of this framework, is from social and narrative context to autobiographical memory: as Robyn Fivush puts it, "it is through joint reminiscing that one comes to have a personal past".[15] A slightly different but compatible stress is on the "spiral" nature of the process, in which the child's changing competence in dialogue about the past itself in turn influences the parent's reminiscence style, encouraging the dynamic co-construction of richer narratives.[16]

The process gets underway as, in many of the child's earliest references to the past, both structure and content is provided to a large degree by adults, whose communicative actions provide the scaffolding for such early memories. So in this social-interactionist tradition the focus is on the impact of differing parental and cultural styles or models for the recounting of past events on the child's own developing memory. In general, for example, the spontaneous later memory activity of children whose parents talk about the past more elaboratively and richly, or more emotionally, will itself be more elaborative or emotional[17]; in general, both mothers and fathers talk more richly and more emotionally about the past with girls than with boys[18]; and a range of cultural differences track these interactions, so that, for example, Caucasian American children's spontaneous memories highlight the self more, in general, than do those of Korean children.[19]

A number of methodological and theoretical questions arise about this research[20], but it is a robust experimental tradition which is now being extended in substantial longitudinal studies.[21] This is crucial not only because we want to know more about any possible longer-term effects of the early narrative environment, but also because we need to tease out the interactions between many different factors. Where some earlier work in this tradition may have given the impression that parental influence—in particular maternal reminiscence style—was always the primary driving force in the emergence of autobiographical memory, the more recent versions clearly operate in a developmental systems framework in which the influence of multiple concurrent processes can vary across individuals. So in

addition to the roles of language in memory, they address the earlier neural and psychological development of other memory systems, the development of a self-schema and of theory of mind, the emergence of a concept of the past, and the role of emotional factors such as attachment. Elaine Reese, for example, has tested the independent contributions of self-recognition, language skill, attachment security, interest and motivation, and maternal reminiscing to children's later autobiographical memory skill.[22] Study of such highly history-dependent developmental processes, in which social and neural influences are "bidirectionally and fundamentally interactive at all levels of organization" poses severe theoretical and empirical challenges.[23] Multiple pathways can lead to generally converging outcomes, but also to idiosyncratically unique individual variation.[24]

How then does this psychological framework relate to philosophical understandings of the nature and role of autobiographical memory? One relevant sophisticated approach is that of John Campbell and his colleagues, which delineates the interconnected features of our mature memory capacities in a way which may seem to be in some tension with the social-interactionist developmental framework.[25]

If autobiographical memory is memory of what one saw and did, when and where, at a particular past time, then according to Campbell it requires the subject to have a conception of the causal connectedness of both physical objects and the self. Children need to grasp that both world and self have a history for genuine autobiographical remembering to get off the ground. For Campbell, this suggests that temporal asymmetry is built into autobiographical memory, in that we are inevitably realists about the past, conceiving of past events as being all, in principle, integratable within a single temporal sequence. Various principles of plot construction thus ground our ordinary memory practices: we assume, for example, that the remembered "I" has traced "a continuous spatio-temporal route through all the narratives of memory, a route continuous with the present and future location of the remembering subject".[26]

We can, in mature autobiographical remembering, assign causal significance to specific events, so that our temporal orientation is by particular times rather than simply by rhythms or phases.[27] I can distinguish one particular occasion on which I had lunch with a colleague on a Tuesday from all other similar occasions. Even though our ordinary ongoing social interaction may depend only on my ability to track the generic pattern or script of this routine, it can of course be crucial in certain key personal and interpersonal contexts to remember a specific episode. Following Campbell, Christoph Hoerl argues that this feature of our concept of time grounds our awareness of the singularity of events and especially of actions. We are thus "sensitive to the irrevocability of certain acts", so that we, unlike other animals and (perhaps) some severely amnesic patients, incorporate a sense of the uniqueness and potential significance of particular choices and actions into our plans and our conceptions of how to live.[28]

Because Campbell's picture treats autobiographical memory as part of a core cluster of interconnected features of self-conscious thinking, it's natural to ask how this cluster emerges in the first place. One reason for looking to developmental

psychology here is to ward off the charge that this account is over-intellectualist: by tracing the gradual emergence of this entwined cluster of capacities we might feel more confident in the possibility of a naturalistic understanding of the psychological status of the putative principles of plot construction in mature autobiographical memory. The point is not to battle over when, in the complex process by which this sophisticated battery of abilities arises, the label of "true" or "full" autobiographical memory should be applied, but rather to seek a detailed delineation of the phases and components of that process, and their interrelations.

But another feature of Campbell's picture may seem to set it at odds with the social-interactionist account of memory development which I sketched above. At first blush, Campbell's view looks rather individualistic, in stressing the place of autobiographical memory within self-conscious thought without explicit reference to the social or narrative environment of early talk about the personal past. What room can it allow for investigating the differential effects of, for example, elaborative or emotional conversations between parent and child on the developing spontaneous memory capacities of the child? What role, in particular, could shared remembering practices have in scaffolding the child's emerging understanding of temporal asymmetry and the difference between past and present?

Although the differences in aims and traditions between the philosophical and psychological traditions in question will not be easily or completely bridged, in this instance we are fortunate to find some recent work which explicitly synthesizes the two in order to arrive at a richer and genuinely interdisciplinary view: it's no accident that this is the result of a collaboration between a psychologist and a philosopher, Teresa McCormack and Christoph Hoerl.[29] The crucial move in the constructive reconciliation is to scrutinize more closely just what the joint aspect of early reminiscing activity is doing for the child, or what it is that is internalized as a result of the adults' mnemonic scaffolding.

According to Hoerl and McCormack, the memory sharing in which parents and children engage can best be understood as a peculiar form of joint attention, directed – unlike other forms of joint attention—at the past. From a philosophical framework close to Campbell's[30] they draw the idea that what the child needs is a new kind of reasoning capacity, one which grasps "the causal significance of the order in which sequences of events unfold": in particular the child has to come to see that "later events in the sequence can obliterate or change the effect of earlier ones", so that the state of the world and of the child's current feelings depends on this independently ordered history.[31] This is a more sophisticated ability than the straightforward temporal updating involved when the child can alter its model of the world as they observe or infer it being modified. Using a delayed video feedback technique in which children are shown two games in different orders, Povinelli et al. showed that 3-year-olds could not use information about which of two events happened more recently to update their model of the world as a series of causally related events unfolds, but that with clear instructions 5-year-olds could do so. Building on these methods in ingenious experiments which examine not only temporal updating but also the ability to make temporal-causal inferences, McCormack and Hoerl have shown that children under age 5, and some 5-year-olds,

who can successfully engage in simple updating, have serious difficulty in making those kinds of temporal-causal inferences in which they must grasp the objective sequence of events.[32]

Hoerl and McCormack then suggest that this kind of temporal-causal reasoning is exactly what's elicited or jointly generated in conversations about past events, in which parent and child together construct a temporally structured narrative which explains the influence of the past on the present.[33] In joint reminiscence of this kind, a parent is often not merely modeling these narrative abilities, but also directly exerting an influence on the child, by encouraging the child to see that things are not now as they once were. The shared outlook on the past which emerges is thus also evaluative, and in turn grounds other ongoing collaborative activities: children come to value memories of particular past events for themselves, "because the sharing of such memories is a way of establishing, maintaining, or negotiating a distinctively social relationship with others".[34]

More generally, Hoerl and McCormack's synthetic account shows us how the local narrative practices studied by the social-interactionists, with all their cultural idiosyncrasies, themselves put the child in touch with an objective conception of time and causation. The practical engagement involved in jointly attending to past events and sharing memories helps the child understand that there can be different perspectives on the same once-occupied time; and thus such shared co-constructed narratives shape the child's initial grasp of the causal connectedness of self and world. Where in Campbell's account there was a sharp distinction between practical and reflective modes of representing time, we can now see the practical and social origin of the child's attention to the past as essential for the child's ability to access and integrate both egocentric and objective conceptions of time.

In this highly promising linkage of philosophy and psychology, there is as yet no clear means to examine different individual trajectories in the emergence of the requisite kind of temporal-causal thinking; this is where, for example, we might hope to inject attention to emotional development and patterns of attachment in relation to early memory capacities. Further work is also needed on the relation between verbal skill and memory development, aimed both at broader conceptual understanding of the relations of language and thought in autobiographical memory, and at more specific investigations of the nature and the timing of any elaborative talk which might enhance verbal and nonverbal recall. But Hoerl and McCormack's programme offers one enticing example of the possibilities for an empirically-informed philosophy and a philosophically-informed cognitive science.

2. SHARED MEMORY, SOCIAL MEMORY, AND SOCIAL ONTOLOGY

In everyday life, and in many branches of the social sciences, memories (like beliefs, desires, intentions, and so on) are commonly attributed not only to individuals but also to small groups, families, institutions and organizations, nations, and other collectives. In mainstream individualist cognitive psychology and philosophy of mind, such talk tends to be treated either as innocently metaphorical or as

troublingly anti-naturalistic, on the edge of Jungian archetypes or morphic resonance. If robust and naturalistically-acceptable grounds could be found for understanding certain kinds of "we-remember" statements as legitimately expressing real shared or social memories, this would not only be of independent interest and utility for the relevant disciplines which deal with such putative phenomena of memory, from history and political theory to cognitive anthropology and, indeed, social psychology; it would also be an important test case for opening lines between the cognitive sciences and the social sciences, and between the philosophy of mind and social philosophy.

One promising direction in which to initiate such integrative enquiries is by calling on the theoretical framework offered by recent multidisciplinary developments in "distributed cognition" and the "extended mind".[35] This is due to the anti-individualism or "active externalism" of these frameworks, by which both mental processes and mental states can spread across brain, body, and environment.[36] In this brief discussion I focus on the roles of the social and cultural world in such distributed cognitive processes, rather than on the technological or physical environment which has perhaps featured more commonly both in the philosophical literature[37] and in critical work on "structural memory" within the social sciences.[38] The ordinary kind of phenomenon in question is illustrated by a story told by the developmental psychologist Susan Engel, whose 12-year-old son once looked up from his homework to ask his mother's help with a writing assignment, asking "Mom, what is my most important memory?".[39]

One easy reading of such anecdotes is deflationary, taking the role of other people as mere cues or triggers to activate the full memory in the individual's head. On this view, appropriate studies of "social memory" would aggregate many individuals' memories in some specific social context: the sociologists Schwartz and Schuman, for example, react against "models that exclude the individual" by surveying what many individuals remember about, for example, Abraham Lincoln.[40] My task in this short section is to marshall some ideas from philosophy and psychology in service of an initial undermining of this deflationary response. In contrast to the claim that other people are always only acting as mere cues or supplements, I suggest that sometimes an enduring, dispositional memory state can be spread across individuals; and in contrast to the claim that the full memory in such cases is waiting inside individual's heads to be triggered by the right stimulus, I suggest that the "memory" which endures in a single brain is often only partial or, in the terms of the French sociologist Maurice Halbwachs, "incomplete" and "shrouded".[41]

Obviously this can be little more than a sketch of some alternatives to merely aggregative individualistic approaches. I begin with two relatively cautious observations/ recommendations. Firstly, a plausible account of social memory is more likely to be anchored initially in mundane, small-scale cases than at the macrolevels of national memory: implications for social theories of collective responsibility or national identity may more securely arise from studies based in interpersonal, family, or small group contexts. Secondly, following Robert Wilson,[42] it's useful to distinguish two different routes to an account of social

memory, even if we go on to pursue both. A weaker version (though still much stronger than the deflationary option) is that individuals can and do engage in some forms of remembering only when (or differently when) they form part of some social group; a stronger version is that it is that group itself which is in some circumstances the remembering subject. As Wilson points out,[43] the former "social manifestation thesis" itself can be given weaker and stronger readings, with the distributed cognition framework suggesting stronger readings in which many forms of individual activities of memory are constituted or realized by "wide" features of the social context. In what follows, I address some empirical work on memory which can best be understood through such an interpretation of the social manifestation thesis, merely mentioning in conclusion some philosophical considerations in favour of also pursuing the stronger "plural subject" account of memory.

When a small group of people—a family group, for example—have lived through certain experiences together, each member will retain their own memories of the events. But it often happens in families that there is some subsequent discussion, reinterpretation, or negotiation about what has happened—about the significance, the affective tone, or just the bare facts. It's no surprise that the initial individual memories may differ from each other in certain ways; and it's well established in social-cognitive psychology that the sharing of memories in the group is likely to elicit more than any of the individuals had remembered, but less than the aggregated sum of individual memories (the latter effect is sometimes called collaborative inhibition—outlying individual memories are for various reasons often dampened or lost in the process). Recent work by William Hirst and his colleagues adds the extra twist of investigating the way in which specific group dynamics and processes can influence the individual members' subsequent enduring memories. In the basic design, each individual first gives their own memories of an event which the whole group has experienced. After various delays, the group as a whole is then asked to recall what happened; and after a further manipulable delay, each member again offers their own memory.[44] Hirst is particularly interested in cases in which a dominant individual or "narrator"—such as one parent in a family group—can have a disproportionate influence on the content (or emotional tone, or narrative structure) of both the group's consensual account (where one emerges) *and* the members' subsequent individual recollections. Memory contents "migrate" in the process of shared remembering, so that sometimes each member's later recall incorporates, without their awareness, elements which were only offered by the dominant narrator in the group phase. Here, then, not only can we think of the collective account produced by the group as itself a "shared" or social memory; we can also see the subsequent individual memories as only manifesting as they do in this specific social context.

This research—like related applied work on "memory conformity" among, for example, groups of witnesses[45]—is part of a mainstream focus in the recent cognitive psychology of memory on the constructive nature of remembering and on the various ways in which "false memories" can arise, even in autobiographical memory, through suggestion, influence, or other misadventure.[46] But much of this

false memory research itself has an individualistic tone which may suggest, again, the deflationary reading of Hirst's work on shared remembering. Just as false memories are often put down to the distorting influences of external authorities who taint the individual's memory in one way or another with misinformation and error,[47] so we might see the role of the group as the social contamination of the ordinary memory processes which basically run inside the head.

But this sharp division between normal individual remembering and abnormal socially-influenced remembering is unrealistic. As Sue Campbell has argued, much ordinary successful "good remembering" depends essentially on the support and involvement of other people.[48] As with the developmental scaffolding provided by parents for early memory (section 1 above), so adult remembering is not necessarily distorted by the close involvement of other people: rather, much remembering is intrinsically "relational". We can accept the lessons of the false memory literature about the various mechanisms and forms of influence in socially embedded and socially manifested remembering without taking on board the associated individualist spin by which "influence" is inevitably negative. Just one suggestive example comes from recent studies by Maryanne Garry and her colleagues. Acknowledging that in real settings, "when confronted with a difficult to remember narrative about [their] childhood, people are likely to rely on others to verify their memories", they allowed subjects exposed to false information to discuss their memories with a sibling.[49] Whereas a significant number of those initially given false information had incorporated it into their own memories when recalling independently, after this phase of "discussion" with their sibling the proportion dropped dramatically. In the right circumstances, other people, as well as photos or other artefacts, can actively and successfully promote or maintain good remembering.

These kinds of empirical research programmes help fill out our responses to the initial deflationary worries about the idea of "shared" or "social" memory. The deflationary idea, recall, was that social factors could only prompt or reactivate pre-existing and distinct memories held by the individual. But if we thus acknowledge that acts of remembering can be "triggered" both by inner and outer factors, it's difficult to draw any principled distinction based on the location of the trigger which doesn't beg the question in favour of individualism. Many internal triggers or cues, of course, can take considerable time, effort, or favourable circumstances to become successfully operative in prompting a memory; triggers which were once external can be more or less successfully internalized; and in many interesting cases the conspiring factors operative in some particular activity of remembering span inner and outer. In such cases we want to understand not only the nature and content of the *occurrent* memory (what I'm remembering *now),* but also the enduring or standing conditions or dispositions which have underpinned, grounded, and shaped this occurrence. Because, in common sense psychology, we accept that a person (dispositionally) remembers many things which they are not now (occurrently) remembering, we are often happy to ascribe to them various standing memories which might in fact take certain convenient coalescing constellations of causes to actualize. It's a matter of degree and of pragmatics how far this constellation can

stretch from including only that the person must be awake and relatively sober, for example, to requiring very specific factors about the presence and role of other people. In some cases the current "inner" components of the spread or distributed dispositional state or field are highly context-sensitive and action-oriented. For both the social scientist influenced by Halbwachs and the post-connectionist cognitive scientist, it's just because memories are not stored fully-formed in independent atomic form at distinct locations between experience and remembering that we rely so heavily on the scaffolding provided by both external symbol systems and the interpersonal world which fills "the necessity of an affective community".[50]

These last remarks are intended to confirm that this inchoate picture of shared and social remembering should be compatible not just with naturalistic materialism but also, preferably, with at least some post-connectionist versions of the computational theory of mind. In particular, we want where possible to identify the content which is carried across or by different vehicles or media, just so that questions about its transmission or distortion can be raised, as in both Hutchins' account of distributed cognition and Sperber's epidemiology of representations.[51] A more ambitious metaphysics still, which would provide a firmer glue between the cognitive and the social sciences of memory, might perhaps come from the philosophical subfield of social ontology.[52] One idea here is to apply Margaret Gilbert's "plural subject theory" to "we remember" statements, along parallel lines to existing treatments of joint action, shared intention, common knowledge, and collective belief: what's particularly useful about Gilbert's framework for understanding some examples of shared memory is that it builds the features of mutual expectations and commitments in to the notion of a plural subject.[53] For the analysis of, for example, "we remember *x*-ing" to offer something stronger than an aggregate of individual memories, we will look to cases in which each individual's memory is incomplete: and thus, in turn, this conceptual framework will have to deal with the kind of empirical work I mentioned above, rendering the exchange between philosophy and psychology ongoing as we should hope.

3. CONCLUSIONS

My angle of entry to the two realms in the interdisciplinary study of memory discussed here has obviously been oriented to highlight the psychological relevance of factors outside the individual. Although enough problems about integrating levels and fields arise within the established subdisciplines of cognitive psychology and neuropsychology, the case of memory renders equally urgent the need to make contact with disciplines traditionally outside the purview of the cognitive sciences. My programmatic remarks may seem unnecessarily constructivist to some, problematically anti-reductionist to others. But, while I can't justify the claim here, I believe that the frameworks I've outlined are entirely compatible at least with the quest for local and integrative reductions: when we really aim at hopelessly complex culturally and phenomenologically salient explananda, such as individual differences in autobiographical memory style, the fact that the prospects of any

straightforwardly reductive explanations are small doesn't mean that we shouldn't seek or that we won't find specific microreductively relevant factors in particular key idiosyncratic explanatory contexts.

More generally, philosophers may reasonably express some skepticism about even the ideal of interdisciplinary theory-construction with which I've recommended scientists of memory should flirt. Patricia Kitcher's powerful analysis of parallels between interdisciplinary explanation in psychoanalysis and cognitive science, for example, pinpoints a number of "subtle and not so subtle dangers" in moving too fast between disciplines and discourses. My whirling optimistic sketches no doubt exemplify some of the troublesome temptations identified by Kitcher, such as trusting too easily in the resources of a neighbouring discipline, disregarding the seriousness of its internal problems; or taking the coherence and compatibility of two theories or frameworks as conclusive evidence for the truth of both.[54] Those interested in trying to forge bridges across the many cultures of memory research must accept their vulnerability to such charges, and hope merely for some imperfect safeguards in the collaborative nature of such research and the spread of expertise: as I've written elsewhere, "a start must be made somewhere, and occasionally a messy preference for proliferation over prudence in difficult domains may pay off".[55] At least, as long as we remain uncertain of how to make sense of the fact that remembering is simultaneously a neural, cognitive, and social activity, there is unlikely to be a shortage of work in the interface between philosophy and cognitive science.

NOTES

[1] Sutton (2003, 2004).

[2] Sheets-Johnstone (1999); Gallagher (2005).

[3] Philosophical: Auyang (2001, pp. 283-306); Rowlands (1999, pp. 119-147). Psychological: Engel (1999); Middleton and Brown (2005); Schacter (1996); Welzer and Markowitsch (2005).

[4] On multidisciplinarity in the cognitive sciences, see von Eckardt (2001); Rogers, Scaife and Rizzo (2005).

[5] Bickle (1998, 2003).

[6] Machamer, Darden and Craver (2000); Craver (2005).

[7] Foster and Jelicic (1999).

[8] Craver (2002); Bickle (2003).

[9] Such as Schechtman (1994).

[10] For more on these terms and on forms of memory, see Sutton (2003).

[11] Tulving (2002); Suddendorf and Corballis (1997).

[12] Nelson and Fivush (2004). For related reviews see Reese (2002a) and the papers in Fivush and Haden (2003).

[13] See, e.g., Thelen and Smith (1994).

[14] Nelson and Fivush (2004, p. 487).

[15] Fivush (2001, p. 51).

[16] Haden, Haine and Fivush (1997).
[17] Reese, Haden and Fivush (1993).
[18] Fivush (1994).
[19] Mullen and Yi (1995).
[20] Sutton (2002).
[21] Harley and Reese (1999); Reese (2002b).
[22] Reese (2002b).
[23] Bjorklund (2004, p. 344).
[24] See Harley and Reese (1999); Griffiths and Stotz (2000).
[25] See Campbell (1994, 1997).
[26] Campbell (1997, p. 110).
[27] See Campbell (1994, chapter 2).
[28] Hoerl (1999, pp. 240-247).
[29] See McCormack and Hoerl (1999, 2001, 2005); Hoerl and McCormack (2005).
[30] See also Povinelli *et al.* (1999); Martin (2001).
[31] Hoerl and McCormack (2005, pp. 267-270).
[32] See Povinelli *et al.* (1999) and McCormack and Hoerl (2005).
[33] Hoerl and McCormack (2005, p. 275).
[34] Ibid., p. 283.
[35] On distributed cognition, see Hutchins (1995); on the extended mind, see Clark (1997).
[36] See Clark and Chalmers (1998). See also this volume, 8, pp. 15-16, and chapter 16 *passim*.
[37] See Clark (2003); Sutton (2006).
[38] See Klein (2000).
[39] Engel (1999, p. 24).
[40] See Schwartz and Schuman (forthcoming).
[41] Halbwachs ([1950] 1980, pp. 71-76).
[42] See Wilson (2004, chapters 11-12).
[43] See Wilson (2005a).
[44] See Hirst and Manier (1996); Hirst, Manier and Apetroaia (1997); Hirst, Manier and Cuc (2003).
[45] See Gabbert, Memon and Allan (2003).
[46] See Schacter (1995).
[47] See Loftus (2003).
[48] See Campbell (2003, 2004).
[49] See Strange, Gerrie and Garry (2005).
[50] Halbwachs ([1950] 1980, pp. 30-33).
[51] See Hutchins (1995); Sperber (1996).
[52] See Gilbert (1989); Schmitt (2003).
[53] See Gilbert (2000).
[54] Kitcher (1992, pp. 159-183).
[55] Sutton (2004, p. 190).