

# Memory, ecological validity and a barking dog

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The study of memory, like our journal *Memory Studies*, crosses many discipline boundaries, aiming broadly to examine the ‘social, cultural, cognitive, political and technological shifts affecting how, what and why individuals, groups and societies remember’ (<http://mss.sagepub.com/>). In editing this journal, my co-editors and I have considered contributions from memory researchers and scholars across a range of fields. For instance, in our first issue in January 2008, we published articles by Campbell (philosophy), Connerton (sociology), Fivush (developmental psychology), Olick (sociology and history), Radstone (cultural studies), Rigney (comparative literature), Roediger and Wertsch (cognitive and developmental psychology), Sturken (media and communication), Till (geography), Yeo (history) and Zelizer (communication and journalism). Looking back over nearly 5 years and 17 issues of the journal so far, the successes of different disciplines and approaches, my own and others, are obvious as we share the task of understanding human memory. But my period as co-editor of *Memory Studies* has helped me to realise that no one has sovereignty over memory. Each of us approach memory from our own perspective, perspectives that bring with them great value as well as, at times, significant challenges.

## The cognitive psychology of memory

I am a psychologist, a cognitive psychologist. Many agree that our field was initially defined by Ulric Neisser (who died in February this year aged 83 years) and by his influential book *Cognitive Psychology* (1967; e.g. Association for Psychological Science, 2012). He argued that ‘the job of cognitive psychologists was to trace the flow of information from input to output’ (W. Hirst, personal communication, 4 June 2012). This stream of *information processing* included ‘all the processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used’ (Neisser, 2007: 277), from the input of perception and pattern recognition to the output of remembering as well as ‘everything in between’ (Neisser, 2007: 276). Neisser offered a compelling rubric within which to organise the findings of existing laboratory studies of cognition, including memory, and to motivate new studies. In the decades after *Cognitive Psychology* (1967) was published, researchers used a range of experimental paradigms to reveal

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broad principles of memory (Kihlstrom, 1996; Kihlstrom and Barnhardt, 1993). According to Kihlstrom (1996: 7–8), such important principles of remembering and forgetting include (but of course are not limited to) the following: (1) the *elaboration principle*, which helps to explain why we are more likely to remember an event later if, at the time we experience it, we relate it to things we already know; (2) the *organisation principle*, which helps to explain why we are more likely to remember an event later if, at the time we experience it, we relate it to other events we have experienced; (3) the *time-dependency principle*, which helps to explain why we are less likely to remember an event as more time passes between when we experienced it and when we try to remember it; (4) the *cue-dependency principle*, which helps to explain why we are more likely to remember an event if, when trying to remember it, we are given informative recall cues; (5) the *encoding specificity principle*, which helps to explain why we are more likely to remember an event if information that was available when we experienced it (for instance, about the event itself or the context in which it happened) is available again (or reinstated) when we try to remember it; (6) the *schematic processing principle*, which helps to explain why we are more likely to remember an event when it is consistent with our expectations and beliefs; and (7) the *reconstruction principle*, which helps to explain why our memory of an event reflects a combination of information encoded at the time of the event and information from other sources.

Cognitive psychologists believe that their laboratory research and principles, such as the ones mentioned above, capture well a fair chunk of what goes on when individuals experience an event and later remember or forget it (Kihlstrom, 1996). But some people, perhaps some readers of *Memory Studies*, worry that traditional laboratory studies of memory are rather sterile and not sufficiently ‘everyday’. One answer to this worry is to think of laboratory-based cognitive psychology as offering ‘a likeness, not a replica’ (Woody and Szechtman, 2011: 13) of memory in day-to-day life.

In a fascinating article from the field of hypnosis (bear with me, I am both an hypnosis researcher and a memory researcher), Woody and Szechtman (2011) described the logic of using hypnotic suggestions to recreate or model clinical symptoms and disorders, such as delusions, hallucinations, functional amnesia and obsessive–compulsive disorder (see also Cox and Barnier, 2010; Oakley and Halligan, 2009). Essentially, we give suggestions to hypnotised people to act and experience in ways that are similar to clinical patients (Bortolotti et al., 2012). By creating ‘virtual patients’, we can develop and test models of psychopathology (Cox and Barnier, 2010; Oakley and Halligan, 2009). Woody and Szechtman (2011) noted that:

Skeptics may question whether such hypnotic recreations of clinical disorders really capture something about the essence of the disorders, rather than merely imitating their surface features. (p. 13)

They also noted a broader worry:

How can we ever be sure that a hypnotic model fully replicates the clinical condition it is modeling? (p. 13)

To address these concerns, Woody and Szechtman quoted Chapanis (1961) who wrote that:

The worst error committed in the name of models is to forget that at best a model represents only a part – and usually a small part – of the thing being modeled. (p. 126)

Woody and Szechtman (2011) argued that:

Experimental results from a hypnotic model need to be evaluated as part of a fuller picture of converging evidence collected in other ways. (p. 14)

I have quoted Woody and Szechtman (2011) at length because their insights into hypnosis seem to apply just as well to the field of memory. Some cognitive psychologists explicitly or implicitly acknowledge that their laboratory work offers a model for complicated processes. For instance, Coman and Hirst (2011) examined retrieval-induced forgetting (forgetting of information that is caused by the repeated recall of other, related information) across a sequence of laboratory interactions as a model of the propagation of selective remembering and forgetting across social networks. But just as sceptics of hypnotic models might question our ability to capture the richness of genuine psychopathology, sceptics of laboratory studies of memory (both inside and outside cognitive psychology) question our ability to help understand the richness of everyday memory. The tension between our need for experimental control (e.g. over people, materials and remembering situations that we study) and the generalisability of our research findings to the ‘real world’ remains a long-standing challenge for cognitive psychology. As Kihlstrom (2002) explained:

The purpose of laboratory research is to understand the real world: to make the problem simple so that it can be studied effectively, and to control relevant variables so that important relations, especially causal relations, can be revealed. Unfortunately, generalization from the lab to the real world requires an inferential leap: its legitimacy depends on the degree of similarity between the conditions that obtain in the laboratory and those found in the real world. (p. 6)

## Ecological validity in memory research

Over the last few years, my colleagues – John Sutton, Celia Harris and Michelle Moulds – and I have been thinking a great deal about ecological validity in memory research. And in the last few weeks, I have had conversations about ecological validity with leading psychologists who worked with or were influenced by Neisser. By ecological validity, I mean to what degree do our laboratory methods and materials capture well the real-world phenomena we aim to understand (but see Kvavilashvili and Ellis, 2004, for a detailed historical and conceptual analysis of the concept of ecological validity)?

In his 1976 book *Cognition and Reality* and (in)famously in his 1978 Keynote Address to the First Practical Aspects of Memory Conference, Neisser called for an ecological approach to memory research.<sup>1</sup> This call reflected a significant shift in his thinking, influenced strongly by J.J. Gibson, away from some aspects of the information-processing approach:

... the commitment to realism, the conception of perceivers as active seekers for information ... I liked them much better than the mechanical chronometric models that had been inspired by *Cognitive Psychology*. (Neisser, 2007: 278)

As J.F. Kihlstrom (personal communication, 12 June 2012) wrote to me:

Neisser always understood that minds were part of people, and people were part of the world – and especially the world of other people. And so he thought that psychologists ought to pay attention to the world, and especially to the relation between mind and world. And by ‘world’ he meant the social world of self and others, institutions and cultures, as well as the physical world of objects and events. (see also <http://socrates.berkeley.edu/~kihlstrm/Neisser.html>)

Kihlstrom pointed to Neisser's work on childhood amnesia and his work on flashbulb memories as two examples of the new, powerful approach that Neisser advocated. Explaining Neisser's (1982) article on 'Snapshots or benchmarks?', Kihlstrom wrote:

Almost everybody else studying flashbulb memories focused on internal mental processes – like the 'flashbulb' mechanism itself, or depth of processing, or the effects of emotion on encoding, or even just the effects of rehearsal gained by telling a story over and over again. But Neisser thought about the role of such memories in personal life and social exchange ('where were you when the Challenger exploded or the World Trade Center came down?'). Even more important, Neisser thought that flashbulb memories had their qualities because they served as benchmarks by which people divided up their autobiographies, and connected their personal stories to public history. Either way, the important thing about flashbulb memories was the role they played in the individual's personal and social life. (for a recent vision of the broader psychological study of flashbulb memory, see Hoskins, 2009)

Neisser's call for ecological validity in memory research influenced generations of experimental psychologists (Association for Psychological Science, 2012). His shifts in perspective on memory and cognition are mirrored in dialogues within cognitive psychology that continue to this day: how best can we 'ramp up' traditional laboratory studies without losing the power of experimental control (e.g. Banaji and Crowder, 1989, 1991; Conway, 1991; Neisser, 1991; Roediger, 1991; Tulving, 1991; more recently, see Erdelyi, 2006, and related commentaries, such as Anderson and Levy, 2006; Kihlstrom, 2006; and Kvavilashvili and Ellis, 2004).

As just one example of this ongoing dialogue, let me sketch recent developments in the experimental modelling of 'memory repression'. Imagine a man who associates a particular song with an unhappy love affair. Each time he hears the song, he tries to avoid thinking of the failed relationship. With repeated avoidance, he remembers less. Anderson and Green (2001) created the Think/No-Think (TNT) paradigm to model this type of forgetting: trying to keep an unwanted memory from mind when confronted with strong reminders. In their standard procedure, people studied word pairs (e.g. roach-ordeal) and learned to verbally recall the second (associate) word when presented with the first (cue) word. During the critical TNT phase, they repeatedly attempted to respond with associated words for some cue words and repeatedly attempted to avoid thinking about and verbalising associated words for other cue words. Later, they tried to recall all associated words. The impact of responding to versus avoiding words was measured against a baseline of words that were neither responded to nor avoided. TNT experiments consistently show that on the final recall test, words avoided during the TNT phase are recalled less often than both respond words and baseline words (for review, see Anderson and Levy, 2009). In other words, repeatedly avoiding words later makes them harder to recall.

Based on the original 2001 findings, many replications and related findings, Levy and Anderson (2008) argued that:

The memory impairment observed in TNT studies suggests that inhibitory control mechanisms may be recruited to prevent unwanted memories from coming to mind. This finding has obvious implications for situations in which people wish to avoid persistent, intrusive thoughts. By this view, repeatedly avoiding memories in naturalistic settings may cause long-lasting impairments at recalling those avoided memories. (p. 628)

Indeed, they invoked processes captured by TNT as a potential explanation for clinically significant remembering and forgetting of a range of real-life traumas (Levy and Anderson, 2008). But such claims seemed premature so long as TNT experiments continued to use simple,

emotionally neutral word lists. In a long-standing programme of research, my colleagues and I successfully have extended other experimental memory paradigms – collaborative recall, directed forgetting, post-hypnotic amnesia, retrieval-induced forgetting and thought suppression – to personal, significant and emotional memories (e.g. Barnier, 2002; Barnier et al., 2004a, 2004b, 2007; Harris et al., 2011). Anderson and his colleagues, researchers in other laboratories and my colleagues and I have been taking similar steps towards greater ecological validity for TNT. For instance, in four studies, we tried to extend TNT to recently recalled, negative, positive and neutral autobiographical memories. We increased the number of suppression attempts for each memory (since in everyday life we probably make many, many attempts to suppress unwanted memories), added a distraction (since thinking about something other than the unwanted memory may help to avoid it) and measured prior trauma exposure (since forgetting may be greater for those either motivated to avoid memories or practised at doing so; Levy and Anderson, 2008). But we failed to find any TNT effects (Selwood et al., 2011; but see Noreen and MacLeod, in press, for a successful partial extension of TNT to autobiographical memories). Obviously, we need to keep working on the gap between what this experimental paradigm currently models about traumatic memory and what we hope and claim it may model.

## Towards a good likeness

In our own research on autobiographical and social memory, my colleagues and I strive to balance the power of experimental control with our desire to map a broader set of memory cases (Barnier, 2010; Barnier et al., 2008). Three elements, I believe, are helping to strengthen the ecological validity of our work, hopefully without sacrificing the strength of its cognitive psychology approach.

First, we focus on nuancing the measurement of memory performance. In a research programme on ‘collaborative recall’, for instance, we have examined the consequences of remembering together in small groups (e.g. couples, siblings, friends, colleagues) versus alone. Most previous research in this tradition has focused just on the products of recall, that is, the amount recalled (e.g. number of words) *on average* by people who collaborate versus people who do not. But this approach misses at least two critical aspects of memory. It misses the process of recall, that is, the ways in which people work together to remember events or information. Moreover, it misses variations across and within groups of memory collaborators and variations across and within memory tasks; in other words, some groups do better than other groups and some groups do better on some tasks than on other tasks. In traditional memory research, such variations are considered measurement error or ‘noise’. Instead, we see them as reflecting untapped variables of the group, how they are interacting and what they are remembering (Barnier et al., 2008; Harris et al., 2011). Indeed, in one study with elderly, long-married couples, we found that the *way* in which these couples recalled the names of their friends and shared past experiences (for instance, the ways in which they cued one another’s recall or co-constructed a joint memory) explained 84 percent of the variance in *how much* they recalled (Harris et al., 2011). So in all of our research, we aim to use sensitive quantitative and qualitative measures of the (individual and group) products and processes of collaboration.

Second, we seek to understand remembering from the rememberer’s point of view (Kihlstrom, 2002). This may seem obvious to scholars in other disciplines, but it is not typical in cognitive psychology. Martin Orne, a hypnosis (and a memory) researcher who hosted Neisser at his Unit for Experimental Psychiatry, University of Pennsylvania as Neisser (1967) wrote *Cognitive Psychology*,

highlighted the influence of ‘demand characteristics’ in laboratory research. As recounted by Kihlstrom (2002), Orne argued that

The experiment is a unique form of social encounter, with roles and rules that are not found anywhere else ... Several aspects of this uniqueness may preclude generalizations from lab to life. (p. 6)

These roles and rules – demand characteristics – threaten ecological validity. So we need to differentiate, Orne (1959, 1962) said, between different factors at work in our experiments: between essence (factors that generalise to the ‘real world’) and artefact (factors that are due to the relative oddness of the experimental setting; see also, Kihlstrom, 2002). To make sense of the experimental findings, Orne urged researchers to engage participants as genuine research partners: to try to understand their behaviour in the experiment from their point of view (but see Sheehan’s (1982) argument that psychological experiments can never be truly collaborative). In our studies of long-married elderly couples recalling together or alone, we formally tested husbands and wives on a range of memory tasks and then debriefed couples and invited them to reflect in detail on their remembering (Harris et al., 2011). When given the chance, our participants were quite as sophisticated and insightful as any researcher in characterising the complexities of their memory systems. For instance – and here, finally, is the barking dog – after one couple had a long discussion about who was responsible for remembering what in their relationship (the wife, almost everything; her husband, far less), the husband happily acknowledged that he relied on his wife to remind him of upcoming events. He said that he saw no need to remember himself because: ‘you don’t have to bark if you’ve got a dog’ (Barnier et al., 2011). This echoes exactly philosopher Mark Rowlands’ (1999) ‘barking dog principle’: ‘if there is something in the environment that can do the job for you, then you do not have to do it yourself’ (Shapiro, 2010: 402). Our elderly couples not only collaborated with each other as rememberers but also with us as co-researchers to interpret their memory performance on the formal tasks and compared to their memory experiences in everyday life.<sup>2</sup> This approach is quite different to traditional memory research in cognitive psychology.

Third, we embrace interdisciplinarity. Our team of researchers based at Macquarie University in Sydney, Australia, includes cognitive, developmental, neuropsychological and organisational psychologists; philosophers; anthropologists; historians; English scholars and others. Discipline boundaries are no impediment but hopefully will drive us to a fuller, more nuanced view of memory. In this issue of *Memory Studies*, you will see further evidence of the possibilities and value of cross-fertilisation. For instance, Catriona Jardine Brown’s article ‘In living memory: Mapping the landscape of Greeham and Crookham Commons’ converges beautifully with recent philosophical ideas about extended mind/distributed cognition (Sutton, 2008; Sutton et al., 2010) and its application to collaborative remembering by people who are part of ‘transactive memory systems’, especially as they age (Harris et al., 2011; see also Barnier, 2010). Brown died far too early, in 2010; her article in this issue was prepared on her behalf and in her memory by colleagues, Eleanor Chiari (University College London) and Gill Rye (University of London). In the project described in her article, this ‘enthusiastic, lively and brilliant young’ scholar and artist interviewed 12 elderly residents of Greenham and Crookham Commons in West Berkshire, UK. Brown used their childhood memories of the Commons to develop a ‘virtual cartography’ of these ‘shared spaces as they were transformed by time, history and ageing’ (p. X). Brown’s work is a model of interdisciplinary opportunities, and I wish I had had the chance to talk and collaborate with her.

## Final thoughts

These are my final thoughts, or my thoughts for now, on my contribution to memory studies and to this young, but increasingly influential, journal. From our next issue, cognitive psychologist, Professor Catherine (Kate) Stevens (<http://marcs.uws.edu.au/people/kate-stevens>), will be taking over as co-editor. As I wrote in my first editorial, for Volume 3, Issue 4 (Barnier, 2010):

Cognitive and other psychologists have a great deal to contribute to such studies of memory. We have clear theories, well-developed methods and substantial data sets, which can provide a useful starting point for explorations of everyday remembering. (p. 295)

I believe these features of our discipline offer great value as we work to understand memory. But balancing experimental control, generalisability and ecological validity in the ‘likenesses’ (Woody and Szechtman, 2011) we create and investigate remains a significant challenge for the field. What, I wonder, do you see as the greatest value versus the greatest challenge in your particular fields? Whatever they may be, I return to Woody and Szechtman (2011: 14), who urged us to seek a ‘fuller picture of converging evidence collected in other ways’. This is exactly what *Memory Studies* aims for and what the articles in this issue, and the 17 issues before it, continue to do very well: *provide and/or analyse converging evidence and/or perspectives on memory collected in a variety of ways*. The field of memory studies needs us all; each of us doing what we do best. Paraphrasing Eugene Winograd’s (1988) eloquent test of the value of research: the one requirement we all implicitly follow is that our understanding of memory is enhanced.<sup>3</sup> Or as Tulving (1991) put it: ‘the approaches may differ, but the objective, the great cause, is the same’ (p. 42).

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## Notes

1. The Society for Applied Research in Memory and Cognition (SARMAC) was founded in 1994 at the Third Practical Aspects on Memory Conference. SARMAC’s 10th Biennial Conference will be held in Rotterdam in June 2013: <http://www.sarmac.org/conferences>.
2. These couples’ ownership of and insight into their memory experiences is shown nicely by their comments during a recent ‘All in the Mind’ programme featuring our research (‘Remembering Together’), which was broadcast on Australia’s Radio National: <http://www.abc.net.au/radionational/programs/allinthemind/new-document/4028890>.
3. Winograd’s (1988) original quote was: ‘the one requirement for scientific research we all implicitly follow: our understanding of memory is enhanced’ (p. 18). I adapted it slightly to recognise our interdisciplinary research traditions.

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