

# Annals of Memory Reconsolidation: Lagging Accounts Cause Confusion

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Interest in memory reconsolidation and in the researchers who study it have been surging in popular media. In science journalism, the writer's task is to make complex, technical matters understandable to non-scientists, so it is common for the accuracy of such accounts of research findings to suffer somewhat. However, in the present situation regarding memory reconsolidation, the departure from accuracy and the promulgation of inaccuracy have recently reached a problematic level, in my view.

A bit of personal background: In 2005, I began combing through through neuroscience research journals, looking for findings that might correspond to the well-defined experiential process, or sequence of experiences, that Laurel Hulley and I had identified in our psychotherapy work as being an innate, core process of transformational change. We had first described this process in our 1995 book *Depth Oriented Brief Therapy*, and the focused guiding of this process is what we later named Coherence Therapy.

In searching through the journals, I came across articles on memory reconsolidation and began studying them closely. I found that in just the previous year, 2004, reconsolidation researchers had identified the very same process that we had found from our clinical observations over a decade earlier. The new research had shown that this process is what the brain requires for transformational, synaptic change of implicit emotional learnings. It was immediately clear to me that these findings had enormous ramifications for psychotherapy and would, without a doubt, drive major advancements in the therapy field—though at that time the clinical world had essentially zero awareness of the newly recognized phenomenon of memory reconsolidation, and nothing had yet been written to guide its clinical application.

Ever since, I have been working with my colleagues in the Coherence Psychology Institute to bring memory reconsolidation to the attention of the clinical field through our writings and conference presentations. A keynote address that I gave in 2006 at the University of California San Marcos was, to my knowledge, the first time an audience of psychologists and psychotherapists had heard about memory reconsolidation and its critical role in transformational therapeutic change. In that talk I said, "We therapists have for several years been hearing a great deal about what neuroscience implies for our work, but not this, not the alterability of longterm emotional memory."

Our writings have mapped out how reconsolidation research translates into a new level of clinical effectiveness, a unifying framework of psychotherapy integration, and a decisive breakthrough beyond nonspecific common factors theory and the almost 80-year-long "dodo bird verdict" that has appeared to limit all therapy systems to the same modest level of efficacy. (For a bibliography of these writings, [click here](#).)

I have continued to study the reconsolidation research articles emerging from labs around the world. (My ability to plunge into the dense technicalities of these articles stems from having worked as a research physicist for fourteen years prior to going into the practice of psychotherapy in 1986.) This extensive scrutiny of the accumulating research has given me both a solid technical knowledge of how reconsolidation works and, to some degree, a sociological knowledge of the world of reconsolidation research.

I mention the latter aspect because it has become clearer and clearer to me that something strange and troubling is happening within the worldwide community of reconsolidation researchers, with major potential effects on the accuracy, or inaccuracy, of our understanding of how reconsolidation works. This problematic situation has been developing for nearly a decade. Erroneous accounts of the reconsolidation process are voiced repeatedly not only by science journalists, but also, to my chagrin and amazement, by prominent researchers. I have been hesitant to address this publicly and have been hoping the situation would correct itself. It hasn't, so I have chosen to advocate actively for accuracy. Reconsolidation is too important to allow our knowledge of it to be obscured and our use of it weakened as a result. Therefore, I have begun to write and publish correctives to the most potentially influential erroneous accounts.

One such corrective---authored by myself, Laurel Hulley and Robin Ticic as a peer commentary on an inaccurate account of reconsolidation by a group of prominent psychologists and researchers---has been accepted for publication in a journal later this year, 2014 (details to be announced).

Another corrective is a letter, reproduced below, that I sent on 3 June 2014 to the editor of the New Yorker magazine, in response to their lead feature article on memory reconsolidation in the 19 May 2014 issue by journalist Michael Specter. That article, "Partial Recall," focused primarily on the work of researcher Daniela Schiller and secondarily on that of researcher Karim Nader. The problem addressed in my letter is that Schiller and Nader, as well as other researchers (including Joseph LeDoux and Elizabeth Phelps, who were co-authors of Schiller's important 2010 article in *Nature*) have been sticking with and promulgating an early account of how reconsolidation works that subsequently has been disproved, decisively and unambiguously, by a sizable body of research findings that have been steadily stacking up since 2004—for ten years now—yet there is no reference to these studies or what they have established in the writings and talks of these lagging researchers who command so much media attention. (To see this stack of studies and findings, visit <https://bit.ly/2b8IbJH>.) The New Yorker article has once again broadcast the early, incorrect account, this time on a bigger scale than ever before. In addition, it contains sizable inaccuracies regarding due credit for how reconsolidation research has developed, as my letter describes.

The correctives that I am providing consist entirely of matters of verifiable fact, not subjective interpretations or opinions. The facts speak for themselves. I am not asking anyone to take my word for it. The area of research in question here has been established more than well enough that the old, initial account of how reconsolidation works can validly be called incorrect. If you wonder why reconsolidation researchers have not spoken out about these matters, and why you are hearing about this from an onlooking psychotherapist, I would largely share your puzzlement

but also suggest that the career-shaping politics within the scientific research world create potent restraints on what researchers say publicly.

It is an historical fact that the march of science often proceeds more according to the drumbeat of politics than that of scientific truth. Research communities can lock onto misguided notions that become unchallengeable for many decades until a corrective movement becomes viable politically. I hope we can prevent that from happening to memory reconsolidation.

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To the Editors of the New Yorker:

Michael Specter is certainly correct that Daniela Schiller's and Karim Nader's studies were important demonstrations of memory reconsolidation ("Partial Recall," May 19th). However, his account contains major inaccuracies regarding the discovery history as well as how the process works.

We're told that Nader's 2000 study was *the* first demonstration of reconsolidation, and that Schiller's 2010 study was *the* first demonstration of a purely behavioral (non-chemical) method for erasing a learned reaction in human subjects. Neither of those is the case, however. Nader used a chemical technique previously applied by other researchers, such as in a 1997 study conducted at the Neuroscience Institute in Paris, France by J. Przybylski and J. Sara and published in the journal *Behavior and Brain Research* under the title "Reconsolidation of Memory After Its Reactivation." Similarly, before Schiller's 2010 article there were at least six published studies reporting behavioral methods of memory erasure or modification in human subjects, starting with one published in 2003 in *Nature* by M. P. Walker and colleagues at the Harvard Medical School's Laboratory of Neurophysiology. What Schiller's study did do first was to target a learned fear with that process in human subjects. It was the erasure of a fear that made it easy for science journalists and the lay public to see direct relevance to psychotherapy. (See below for a list of those six publications.)

There's a yet more serious inaccuracy in Specter's piece regarding the operation of reconsolidation itself: the idea that what destabilizes a memory and induces its reconsolidation is the memory's reactivation alone. That conclusion, drawn from the early studies in the 1997–2000 period, later proved incorrect as researchers in many labs showed that there was more going on than was apparent initially. Yet some researchers, including Schiller, Nader and LeDoux, have long held to that erroneous view even after the corrected understanding emerged, starting with a 2004 article in *Learning & Memory* from H. Maldonado's group at the University of Buenos Aires. These studies—fourteen that I've found so far, listed online at <https://bit.ly/2b8IbJH>—show decisively that memory destabilization and reconsolidation do not result from reactivation alone. Rather, what's required is the experience of reactivation *plus* a second, concurrent experience of what researchers term "memory mismatch" or "prediction error," meaning something strikingly discrepant with what the reactivated target memory "knows" or expects. It makes sense that reconsolidation, being the brain's process for updating

memories, would be triggered only by new information that is at odds with the contents of a reactivated memory.

Neither Specter nor the researchers he covers mention the fact that we psychotherapists have already translated the research, including the vital requirement for mismatch, into a versatile therapeutic methodology. The first complete clinical text defining and illustrating the new psychotherapy of memory reconsolidation was published in 2012 by Routledge, under the title *Unlocking the Emotional Brain: Eliminating Symptoms at Their Roots Using Memory Reconsolidation*.

In light of the above distortions, "Partial Recall" is an even more fitting title than Specter may have realized.

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*Pre-2010 studies reporting behavioral methods of memory erasure or modification in human subjects:*

Forcato, C., Argibay, P. F., Pedreira, M. E., & Maldonado, H. (2009). Human reconsolidation does not always occur when a memory is retrieved: The relevance of the reminder structure. *Neurobiology of Learning and Memory, 91*, 50–57. doi:10.1016/j.nlm.2008.09.011

Forcato, C., Burgos, V. L., Argibay, P. F., Molina, V. A., Pedreira, M. E., & Maldonado, H. (2007). Reconsolidation of declarative memory in humans. *Learning & Memory, 14*, 295–303. doi: 10.1101/lm.486107

Galluccio, L. (2005). Updating reactivated memories in infancy: I. Passive- and active-exposure effects. *Developmental Psychobiology, 47*, 1–17. doi: 10.1002/dev.20073

Hupbach, A., Gomez, R., & Nadel, L. (2009). Episodic memory reconsolidation: updating or source confusion? *Memory, 17*, 502–510. doi: 10.1080/09658210902882399

Hupbach, A., Gomez, R., Hardt, O., & Nadel, L. (2007). Reconsolidation of episodic memories: A subtle reminder triggers integration of new information. *Learning & Memory, 14*, 47–53. doi: 10.1101/lm.365707

Walker, M. P., Brakefield, T., Hobson, J. A., & Stickgold, R. (2003). Dissociable stages of human memory consolidation and reconsolidation. *Nature, 425*, 616–620. PMID: 14534587