



Published in final edited form as:

Trends Cogn Sci. 2011 August ; 15(8): 340–341. doi:10.1016/j.tics.2011.06.006.

The familiarity/recollection distinction does not illuminate medial temporal lobe function: response to Montaldi and Mayes

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Montaldi and Mayes [1] write that the distinction between recollection and familiarity is critical for understanding medial temporal lobe function. They begin by suggesting that the hippocampus has a role in pattern completion. We agree. However, they link pattern completion to recollection, which overlooks the possibility that familiarity might also depend on pattern completion. Furthermore, even if one assumes that pattern completion implies recollection, the idea that the hippocampus supports pattern completion does not imply that it cannot also support other memory processes.

Whether familiarity involves pattern completion or not, when strong recollection is compared to equally strong familiarity, much evidence suggests that the hippocampus supports both processes [2–6]. Montaldi and Mayes [1] disagree. In their view our source memory studies that eliminate the memory strength confound [2–4] are not compelling because source memory procedures have limitations. However, source memory studies that do not control for memory strength have often been cited in support of the idea that the hippocampus selectively subserves recollection, even by these authors [7]. We simply eliminated the strength confound and then used the same logic for interpretation that one finds in many earlier studies. The main limitation of the source memory procedure is that even when a particular source question is answered incorrectly (suggesting a failure of recollection) it is possible that some task-irrelevant source recollection has occurred. All methods of measuring recollection and familiarity have inherent limitations, and converging methods must be used. The strength confound has been a limitation of many of these methods, and this particular limitation can and should be corrected.

Montaldi and Mayes [1] would also disqualify from consideration our recent studies with amnesic patients that eliminated the strength confound [4,5] because those patients are already known to have a familiarity deficit. In their view, nothing new can be learned from these patients, and discussion should now be limited to other hippocampal patients who are thought to have preserved familiarity. This is a puzzling proposal. If we already know which hippocampal patients have preserved familiarity and which do not (usually based on methods that involve a strength confound), then no further testing of any patients would be needed. One reason for apparent discrepancies in the literature might be that the methods used previously to assess recollection and familiarity were often flawed. As novel methods of assessing recollection and familiarity are developed, every relevant patient should be tested and conclusions should be based on the evidence from all patients.

Finally, Montaldi and Mayes [7] attempted to equate for memory strength in one Remember/Know study and reported that hippocampal activity was elevated only for recollection-based decisions. Their results, as originally reported [7], actually demonstrated the typical strength confound between remembering and knowing in that accuracy was not equated (see [8]). A later reanalysis of the behavioral data in a review article suggested that accuracy was equated after all [9]. The difficulty is that the functional magnetic resonance imaging analysis [7], which compared strong recollection to strong familiarity, was problematic. First, no minimum cluster size was used. Second, two small hippocampal clusters (one containing 2 voxels and the other containing 6 voxels) were identified but only when a more lenient threshold was used than was used for all the other data analyses [7]. Third, and inconsistent with current standards, no correction for multiple comparisons was used. Although the results of this particular study are unconvincing, controlling for memory strength using the Remember/ Know procedure is a rare and much-needed experimental approach [8]. We recommend that more studies be carried out using this strategy. Setting aside the finding reported by Montaldi and Mayes [7], we cannot identify a single study that matched for memory strength and did not find that the hippocampus supports both recollection and familiarity ([2–6]; see also [10]).

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