

## Context messes with massive memory

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Humans are capable of remembering massive numbers of objects or scenes with surprisingly precise recollection of details. What happens if we try to memorize clearly specified objects in scenes when the rest of the display is irrelevant or distracting? Here we report that, curiously, memory for individual objects is impaired when those objects are presented in scenes that are irrelevant to the observer's task. We asked observers to memorize single objects on blank backgrounds, in arrays of objects, or appropriately embedded in real scenes, but clearly marked by an outline box. As in previous work, objects, presented in isolation, are remembered very well ( $d'=2.27$ ). Performance was significantly reduced when these same objects were presented in a random array of irrelevant objects ( $d'=1.71$ ). If the irrelevant objects were different at retrieval, performance was lower ( $d'=1.38$ ) though not significantly. Performance was reduced to  $d'=1.40$  when objects were embedded in real scenes, even though they were clearly marked. If observers learned objects in one scene context and were tested with the objects in a different context, performance was very poor ( $d'=0.64$ ) even though scene contexts were irrelevant. When we made the objects perceptually stand out from the background scene by pasting them into the scene in a white box the performance did not improve ( $d'=0.69$ ). Scene context interfered even if the target objects were incongruent to the scene context ( $d=1.13$ ). Performance was worse if the scene context was present only at encoding ( $d'=0.64$ ) than when present only at retrieval ( $d'=1.34$ ).

Apparently, when trying to remember one part of a display, observers are unable filter out additional information even when it is irrelevant. The rapid, effective encoding that makes scene memory so easy, appears to be obligatory and to be a source of interference when observers try to ignore part of that scene.