Knowing what you missed in hybrid visual search

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Mixed-hybrid search is a model task for investigating errors in everyday visual search when simultaneously searching for multiple types of targets (e.g., finding a specific freeway exit while also searching for the category of "obstacles" such as barriers, workers, or raccoons). In mixed hybrid search, people are better at finding specific items but often miss the more categorical targets. Using methodologies from the Inattentional Blindness literature, a previous study found that when participants miss items during search, they can identify the correct item significantly above chance in a subsequent 2AFC identification task, even while reporting little or no awareness of missing any items. What type of information is retained about these missed items that later enables one to identify them correctly? Might participants have rough categorical representations about the missed item, even when guessing about the specific item within the category? Our participants searched for two specific items and two categories of items with 0, 1, or 2 targets present. Stimuli were visible until participants responded. Following each trial, participants rated their confidence in their search response (0-100), then performed a 2 or 6AFC task to identify potential missed targets. Finally, they reported their confidence in their forced-choice selections. In the 6AFC task for categorical missed targets, participants identified the exact missed item 46% of the time (chance is 16.6%, $t(12)=5.1$, $p=0.003$). Participants correctly answered the 6AFC when uncertain about their search performance (34 on a 100-point confidence scale). However, when confident that no target was missed (confidence 88), they guessed in the 6AFC task, both about the item and the category (40%, chance=40%). Overall, observers have some awareness of missed information in search even if the search is self-terminated. However, when they are sure they missed nothing, there does not appear to be any subsequently recoverable information. (297 words)