Can eye-movements trigger memory recall?

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Introduction
A large body of research suggests that when we retrieve visual information from memory, we look back to the location where we encoded these objects. It has been suggested that the oculomotor trace we act out during encoding is stored in long-term memory, along other contents of the episodic representation. Further, it was proposed that the components of episodic memory representations can co-activate each other (e.g., visual information can trigger spatial information).

If memory recall moves the eyes to revisit the location where the stimulus was encoded, is there also an effect in the reverse direction?

Can eye movements trigger memory recall?

Method
Participants
98 participants were recruited
5 subjects were excluded (guessed the hypothesis)
53 females, 40 males
Age (range 18-70): M = 31.398, SD = 14.931

Material
96 greyscale faces from the FERET database, in pairs
The average morph of each pair (n = 48)
Visual masks for each face built from face material
Fixation crosses in 18pt black Courier font

Procedure
Group 1: eye-movement and location repetition

Group 2: eye-movement repetition

Group 3: no eye-movement repetition

Results
All proportions were significantly above/below chance level (p < .001) except for face 1 repetitions in group 1 (p = .217).
One-way ANOVAs revealed a main effect of group both for face 1 responses (p < .001) and for face 2 responses (p = .006).
Tukey comparisons revealed significant differences between group 1 and 2 (p < .001) and between group 1 and 3 (p = .006) in face 1 responses and between group 1 and 3 in face 2 responses (p = .008).

Conclusion
Participants’ perception was only influenced by eye-movements when the saccade (+location) of the second face was repeated.
When controlling for a recency effect, eye-movement only influenced memory recall in combination with location influences.
One might interpret that eye-movements bias memory recall but only in a fragile and short-lasting way.
More research is needed to find out what role location congruency plays in this regard.

References
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