Scene Context Can Cue Source Memory for Words

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Introduction

- Episodic memories of past events are made up of disparate elements bound together, such as people, places, objects, actions.
- Are these multiple elements always recalled together? At test, partial cues are thought to trigger pattern completion with holistic recollection of all elements of an episode together (Horner & Burgess, 2013). This is supported by findings of dependency in recall of different elements. But dependency is incomplete, often less than 10% (see Starns & Hicks, 2015, for review).
- Dependency in source memory can be probed with cross-dimensional cueing. Contrary to holistic recollection, externally cueing one element of an episode (face gender) did not enhance memory for another element (face location) (Hicks & Starns, 2016).
- We 1) assessed cross-dimensional cueing of source memory for objects with scene context (Experiments 1a-b) and 2) explored whether dependency in memory for two uncued event elements would be effected by a cue (Experiment 2).

Methods

Experiments 1a (N = 23), and 1b (N = 33) vs. Experiment 2 (N = 60)

- Visual Trial
  - Connect word and object shown in the scene
  - HAT
  - Cued test trial showing studied scene (Expt 1a,b) or face (Expt 2) with word probe
  - Uncued = no cue
  - Subjective recollection
    - (Expt 1a,b) or Source memory for second element (Expt 2)
  - SCENE?
    - INDOOR – OUTDOOR
    - UNSURE – NEW

- Auditory Trial
  - How easy was it to form a mini-event?
    - A (Very easy) – B – C (Very hard)
  - Source memory decision for object (Expt 1a,b) or first element (Expt 2) incl. unsure option to exclude low confidence memory
  - OBJECT?
    - LIVING – NONLIVING
    - GUESS
  - RECOLLECT: FAMILIAR

- Data for Experiments 1a-b each from one of 3 study-test cycles
- Studied 72 trials including 12 scenes, self-paced study (cue overload = 6)
- Test 72 trials at 5 sec SOA
- Experiment 2 used 1 study-test cycle, 3 element design
- Studied 96 trials including 16 faces, 30 second study time (cue overload = 6)
- Test 96 trials at 3 sec SOA
- Source memory test order counterbalanced across participants
- Data analysis with R 4.0.2 version and Tidyverse packages
- Measured discrimination between 2 sources at test using d’ and source memory dependency following Horner and Burgess (2013)

Results

- In Experiments 1a and 1b accuracy (d’) was higher and recollection more likely when the scene was included as an external cue relative to no-cue trials. (Experiment 1a: t(23) = 3.14, d = 0.93, p = .003; Experiment 1b: t(33) = 5.68, d = 0.82, p < .001).
- These cross-dimensional cue effects were larger for Recollected items taken alone. (Experiment 1a: t(23) = 6.95, d = 1.95, p < .001; Experiment 1b: t(33) = 6.36, d = 1.11, p < .001).
- But in Experiment 2, cues did not improve source memory for objects (seen/heard) or scenes (indoor/outdoor) relative to no-cue trials. (t(60) = 0.41, d = 0.05, p = 0.687, BF for null = 0.20).
- Furthermore, in Experiment 2, cues did not improve source memory for the first source question asked. (objects seen/heard asked first: t(30) = 1.69, d = 0.24, p = .101; scene indoor/outdoor asked first: t(30) = 0.09, d = 0.00, p = .930)

Conclusions

- Strong cross-dimensional cueing in Experiments 1a and 1b: representing a studied scene improved source memory for objects that had been studied with probe words. As large or larger cueing effects for recollected items taken alone.
- These data support holistic recollection, showing that cross-element links can be powerful.
- But: no cross-dimensional cueing in Experiment 2 where representing a studied face did not improve source memory for the objects or scenes, when probed with the object names.
- Note: we also found significant dependency between object and scene source memory in Experiment 2 but could not assess cue effects on dependency in light of null cue effects on memory for individual dimensions.
- A strong version of holistic recollection predicts that cueing will not modify dependency.
- Taken together, findings may suggest that spatial context plays a special role in the way episodic memories are represented, stored and retrieved (see Smith and Vela, 2001).
- We are currently testing these hypotheses.

References


