Self-Generated Cues: The role of cue quality in facilitating eyewitness recall

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Abstract

Purpose

Witness-led techniques, informed by theory, have been recognised as best practice for eliciting information from cooperative eyewitnesses. In the current research, we test a self-generated cue (SGC) mnemonic grounded in memory theory and explore the impact of three SGC mnemonics on subsequent recall performance.

Methodology

Participants (N = 170) witnessed a live staged event and reported their recall using a SGC mnemonic (keywords only, event-line, or concept map) or control technique (other-generated cues or free recall only). These mock witness accounts were compared in terms of correct and incorrect details reported.

Findings

Fewer correct details were reported in the other-generated cue condition compared to the SGC event-line (p = .018) and SGC concept map (p = .010). There were no significant differences between free recall alone and any other condition. The number of inaccurate details reported did not differ between conditions (p = .153). Our findings suggest that high quality free recall instructions can benefit recall performance above generic cues (e.g. other-generated cues) but using SGCs to support a structured recall (e.g., concept map or event-line) may offer an additional recall benefit.

Originality

Our findings support previous research that SGCs benefit recall beyond other-generated cues. However, by comparing different cue generation techniques grounded in the literature, we extend such findings to show that SGC generation techniques are not equally effective and that combining SGCs with structured recall is likely to carry the greatest benefit to recall.

Keywords: Self-Generated cue; Cognitive mnemonic; Information elicitation; Witness-Led recall; Retrieval cue; Cue quality

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Self-Generated Cues: The role of cue quality in facilitating eyewitness recall

In countries with well-developed investigative procedures, the Cognitive Interview (Geiselman *et al.*, 1986*)* is generally recognised as the 'gold-standard' interviewing approach for eliciting 'best evidence' from cooperative adult witnesses (Fisher & Ashkenazi, 2023; Memon *et al.*, 2010). Each mnemonic technique included in the Cognitive Interview is underpinned by two key memory principles. First, effective retrieval cues overlap considerably with encoded information (Geiselman *et al.*, 1986; Tulving & Thomson, 1973). Second, as a memory trace comprises multiple items of related information, different retrieval cues can facilitate the recall of different items of information (Geiselman *et al.*, 1986). Following these principles, we tested a self-generated cue (SGC) mnemonic similarly grounded in memory theory, with the aim of providing an intuitive witness-led method of facilitating reliable eyewitness recall.

A SGC is a memory cue generated according to the individual's representation of a target memory. Cues generated in this way are therefore unique to the individual in their ability to functionally represent the critical properties of the target memory (Mäntylä, 1986; Mäntylä & Nilsson, 1983; Wheeler & Gabbert, 2017). As such, a SGC is a cue actively generated by the individual, representing the critical properties of the target memory, and generated with the purpose of facilitating more complete retrieval of a target memory. For example, the cue might focus on details salient to the individual or use idiosyncratic private (rather than public) information.

SGCs and cue quality

Using SGCs in an investigative context, for example to prompt a witness to consider key aspects of the target event themselves, may optimize cue saliency, promote high cue-target overlap, and potentially result in greater activation of the memory network (Wheeler &

Gabbert, 2017). In line with memory theory, these properties are likely to increase the quality of the retrieval cue (see for example, Anderson, 1983; Tulving & Thomson, 1973). However, the real value of SGCs may lie in their ability to maximize cue distinctiveness (Kontogianni *et al.*, 2018; Wheeler & Gabbert, 2017). Nairne (2002) argued that cue distinctiveness has a stronger influence on retrieval than encoding-retrieval overlap. A distinctive cue is uniquely associated with a target memory. Such cues are effective because they match the target event to the exclusion of all other events, thus they resolve interference from other memories. In contrast, where the cue relates to a number of different memories, it is less effective at recalling the target memory and may even impede recall by allowing more interference from other memories (Earhard, 1967; Watkins & Watkins, 1975). Cue-target match is therefore necessary but not sufficient for accurate retrieval; the diagnostic value of the cue is key to the quality of the retrieval cue (Goh & Lu, 2012; Nairne, 2002).

Memory theory (e.g., Anderson, 1983; Nairne, 2002; Tulving & Thomson, 1973; see Wheeler & Gabbert, 2017 for a review) suggests that SGC mnemonics can increase the diagnostic value of retrieval cues. Cues generated for our own use are more varied, more idiosyncratic, make more use of privately held information about a target item, and are less reliant on cue-target associative strength than cues generated for “a learner very different from you” (Tullis & Benjamin, 2015a). Informing an individual that their cues may be used to guide further recall increases cue distinctiveness (Tullis & Benjamin, 2015b), suggesting conscious use of cue distinctiveness as a cue generation strategy. Thus, a high quality self-generated cue is likely to be more idiosyncratic and distinctive, but these properties also mean such cues are unlikely to benefit someone else’s recall (Nairne, 2002; Tullis & Benjamin, 2015a; Tullis & Benjamin, 2015b).

Overall, SGCs can benefit recall through providing an opportunity to capitalize upon spreading activation and cue overlap theories of memory while maximizing the distinctiveness of cues to increase their diagnostic value (see Wheeler & Gabbert, 2017, for further discussion). The question then arises of how best to prompt high-quality cue generation. Several promising strategies have been employed in the literature. For example, keyword generation (Tullis & Benjamin, 2015a; van Dam *et al.*, 1987), or self-directed reporting using the Sketch MRC (Dando *et al.*, 2009), the Timeline Technique (Hope *et al.*, 2013; 2019; Kontogianni *et al.*, 2018; 2020), or a body diagram (e.g., Gabbert *et al.*, 2009; Gabbert *et al.*, 2020). However, research has not yet examined the impact of different SGC mnemonics on recall performance. We identified three different techniques for eliciting SGCs from the analogous literature: (i) self-generated keywords only, (ii) a concept map, and (iii) an event-line. These techniques were compared to establish the most effective means of generating high quality and effective retrieval cues.

Self-generated keywords

Keyword generation can facilitate recall. For example, van Dam *et al.*, (1987) found that recall of 20 standalone paragraphs in a factual narrative was improved when participants first generated a list of keywords representing each paragraphs content. Within the present study participants generated a number of keywords representing key aspects of the target memory. Specifically, feeder headings to generate keywords pertaining to Person, Action, Object, and Location were included as, based on the spreading-activation theory of semantic processing (Collins & Loftus, 1975), these categories may act as primes for successive recall. Indeed, research on Category Clustering Recall (Paulo *et al.*, 2016; 2017) suggests that asking participants to organise their recall by information categories (such as person details, action details and so on) increased the amount of information recalled in a subsequent retrieval attempt (Paulo *et al.*, 2016; 2017; Shahvaroughi *et al.*, 2020). The combination of SGC keywords with a second strategy has been shown to be effective by Kontogianni *et al.*

(2018; 2020), thus we combine SGC keywords and basic category clustering within the current study.

A concept map

A concept map provides a graphical organizational framework for knowledge. In education settings concept maps allow connections to be built between learned concepts (Polancos, 2012) and facilitate the communication of complex information (Kinchin, 2000). Concept maps present concepts and the relationships between them in a hierarchical structure, where concepts increase in specificity (Cañas & Novak, 2006). This mirrors the associated network organization of memory and so might facilitate witnesses in accessing increasingly specific information crucial for an investigation. We incorporated the concept map into the present study as a means of organizing previously generated concepts (SGC keywords) to establish whether the benefit demonstrated throughout educational research applies in an eyewitness setting.

An event-line

Another potential way to facilitate interviewees to generate their own high-quality cues may be through use of a temporally focused event line. Retrieval aids that provide cues as to the temporal context of a target event, such as timeline or calendar instruments, can facilitate retrospective retrieval of autobiographical events (see, for example, Glasner & van der Vaart, 2009; van der Vaart & Glasner, 2007). Using a timeline has also been shown to aid recall of episodic events rich in temporal detail or involving multiple actors (Kontogianni et al, 2018; Hope *et al.*, 2013; 2019). The benefit of a timeline likely lies in allowing interviewees to make use of the natural temporal ordering of episodic memory and facilitating recall via episodic clustering (Hope *et al.*, 2013). While semantic clustering has received attention in the eyewitness literature (e.g., Bousfield, 1953), temporal clustering has been examined less frequently. Classic free recall studies have demonstrated temporal contiguity – that items learned in close sequential positions tend to be recalled in close proximity (Deese & Kaufman, 1957; Polyn *et al.*, 2009). Both semantic relatedness and temporal contiguity can predict the successful recall of a given item (Kahana *et al.*, 2008). Through the use of an event line in the current study we aim to explore whether the temporal structuring of retrieval cues facilitates free recall to a greater extent than SGC keywords alone.

The Present Study

The present research investigates whether SGCs maximize cue quality and so represent a viable cognitive mnemonic strategy to facilitate eyewitness recall. To establish whether the benefit of SGCs lies in the generation process or the presence of the cue itself, we included two control conditions: a free recall alone condition and an 'other-generated' cue condition. The other-generated cues were keywords generated by a previous pilot participant. We include an ‘other-generated cue’ control condition to represent those scenarios where an individual may be asked to focus on cues generated by someone else, such as prompts from the interviewer. We hypothesized that use of an SGC mnemonic would facilitate the recall of more correct details than both the other-generated cue and free recall only control conditions.

Method

Design & Participants

A between-participants design with five conditions (SGC keywords only, SGC concept map, SGC event-line, other-generated cue keywords, & free recall only) was used. The dependent variables were the number of details reported (correct and incorrect) and the accuracy of reported information. Ethical approval for this research was provided by the psychology department research ethics committee.

A total of 170 Psychology undergraduate students took part in exchange for course credit. Participants were randomly allocated to one of three experimental conditions (self-generated cue keywords only n = 29, self-generated cue concept map n = 35, self-generated cue event-line n = 36) or one of two control conditions (other-generated cue keywords n = 37, free recall only n = 33). Participants were aged 18 to 58 years old (M = 20.17, SD = 4.38), and 144 participants were female (one participant did not select either gender category).

The sample was drawn from a student group who attended a scheduled lecture in which a live event was staged. A post-hoc G*Power sensitivity analysis was conducted to determine the minimum effect which could reliably produce a statistically significant result given the sample size (Faul *et al.*, 2007; Perugini *et al.*, 2018). Given the sample size (170 participants randomly allocated across five groups) and an alpha error probability of .05, there is 80% power to detect effect sizes of Cohen's f = 0.27. This equates to an effect of d = 0.54 and η^2 = 0.07 (see Lenhard & Lenhard, 2016, for transformation of effect sizes). This represents the smallest effect which can be reliably detected at 80% power.

Materials

Stimulus Event

A live event (approximately 2 min 30s in length) was staged during the opening ten minutes of an undergraduate lecture. Two actors staged a short verbal confrontation over a lost bag at the front of the lecture hall. A woman entered the lecture as it began and approached the lecturer (a confederate) holding a bag she had purportedly found unattended outside. The woman and the lecturer began to go through the contents of the bag to prompt a response from the owner. A man entered the lecture theatre and a short verbal confrontation ensued between the woman and the man, following which the man retrieved his bag and left.

The woman apologized to the lecturer and left the room (as did the lead author who had been present in the lecture theatre to covertly film the event).

Response Booklets

Participants were provided with two response booklets: one for cue generation and one for free recall accounts. Removing cue generation instructions from free recall accounts allowed participant statements to be blind coded by the first author to reduce potential experimenter bias.

Cue Generation Booklets. For each of the three self-generated cue conditions, participants were prompted to generate short keywords relating to the event to guide their free recall. Comprehensive written instructions were given to participants to assist them in generating retrieval cues. These instructions for each condition are outlined below.

SGC keywords only: Participants were prompted to write down short keywords or phrases (one or two words only) relating to the event to facilitate their free recall. Participants were asked to spend minimal time thinking about these cues and were instructed that they should be the details that came most immediately to mind regardless of what they were or their central importance to the event. Participants recorded these self-generated keywords or cues in a blank table with the following headings and instructions: Location (list up to five details about where the event took place), person or people (list up to five details about the person or people involved in the event), object(s) (list up to five details about any object(s) that was/were involved in the event), and action(s) (list up to five details about what happened during the event).

SGC concept-map: Participants were introduced to the idea of concept maps as being a method to illustrate complex ideas in a similar way to a spider diagram. Participants were asked to list up to 25 key details of the witnessed event, based on the recommendation of using 15-25 concepts to build an effective concept map (Novak & Canas, 2006). These details should be short keywords (one or two words only) relating to the event. Participants were instructed that these should be details that most immediately come to mind regardless of what they are or their central importance to the event. Participants were also told that they might find it helpful to consider the location, people, objects and actions involved in the event. Following this, participants were guided in using their list of details to complete a concept map. They were instructed that (i) key details (concepts) should be enclosed within a box, (ii) concepts should be linked by lines or arrows (cross links), and that (iii) cross links should be labelled with one or two words to explain the relationship. An example concept map for an unrelated topic was provided.

SGC event-line: The event-line did not involve pre-generation of cues, with participants instead generating their keywords during the task. Participants were asked to briefly note key parts of the witnessed event on a horizontal line which represented the duration of the event. The cue generation instructions emphasized that initial descriptions of “who did what, and when” should be brief, as there would be the chance to elaborate later. Although the event-line allowed participants to sequentially organize their keyword descriptions of event stages, the instructions also made clear that it was not essential for the event-line to be completed in chronological order. Following this, participants were presented with a textbox and asked to note down any further cues (keywords or phrases) related to the event, but which did not appear on the event-line.

Two control conditions were also included: (i) an other-generated cue keyword table, and (ii) a free recall only condition. The other-generated keyword condition encouraged participants to consider cues that had been generated by pilot participants. These were presented in a table under feeder headings of location, person or people, object(s), and action(s) as in the self-generated cue keywords condition. Participants were asked to think about each of these details in turn with the goal of recalling additional information about the event. In the free recall only control condition, participants were not provided with any guidance on retrieval cue strategies and instead progressed directly to the free recall stage.

Free Recall Booklets. All participants were provided with a free recall booklet regardless of condition. Free recall instructions encouraged participants to focus on individual details of the event (which may have been self-generated or presented to them), spending at least 30s considering each cue in turn and focusing on creating a clear picture of the event in their minds eye. Participants were told that they might find it helpful to close their eyes or look at a blank wall or the floor while remembering. Following this, all participants were instructed to write down as many details as they could remember about the event. They were asked not to guess at any details that they were unsure of and to provide as complete and accurate report as possible.

Procedure

The event was staged during the opening ten minutes of an afternoon lecture. The recall session took place approximately 24-hours later in a different lecture theatre. Participants were not forewarned that they would be asked about the live event in the recall session. During the recall session participants were randomly allocated to one of the five conditions. Participants were instructed to work under exam conditions while completing their recall task and monitored to ensure this was the case (experimenters were available to answer any queries that arose). Participants were given written instructions on the method they should use to facilitate recall in the cue generation response booklet. The cue generation booklet for participants in the free recall only condition did not provide any cue generation instructions and instead directed participants immediately to the free recall response booklet. All participants then completed their free recall account in the separate free recall response booklet. After the instructions in both the cue generation booklet and free recall booklet, participants were asked to check a box to indicate that they had read and understood the instructions and to raise their hand to speak to an experimenter if they had any questions. The recall task was self-paced, although the nature of the session meant that participants were limited to approximately 30-minutes on the task.

Coding

A coding protocol was developed with reference to the video recording and photographs from the live event. Free recall responses were blind coded by the first author against this protocol for accuracy. Each detail reported was coded as correct or incorrect; correct items were those accurately described as presented in the stimulus event while incorrect items were either present in the event but inaccurately described or were absent from the event entirely. Subjective or ambiguous responses (for example, conjecture about emotional states) were not scored. Accuracy rate was calculated by dividing the total number of correct details by the total count of information recalled. This score was then converted to a percentage.

To assess inter-coder reliability a sample of 17 responses (10% of the overall sample) were scored by an independent coder. Pearson correlations were calculated between the primary and independent coder for total correct items ($r = .83$, $p < .001$) and total incorrect items ($r = .72$, $p = .001$). Inter-coder reliability was therefore deemed to be of an acceptable level.

Anonymized data and all materials have been made publicly available on the Open Science Framework (OSF) and can be accessed at https://osf.io/63kuw/?view_only=9b3e5ae8334741389dd1f5978b1d70e3.

Results

Mean scores (shown in Table 1) suggest that overall SGCs facilitate reporting of more correct details than either control condition (other-generated cue or free recall only). The difference between conditions was statistically significant; F (4, 165) = 3.91, p = .005, η_G^2 = .09, 95% CI [.01, .16].

Table 1 around here

Post-hoc tests with a Hochberg correction for multiple comparisons suggest that significantly fewer correct details were reported in the other-generated cue control condition compared to both the SGC event-line (p = .018, Cohen's d = .83, 95% CI [.35, 1.31]) and SGC concept map (p = .010, Cohen's d = .83, 95% CI [.35, 1.31]). All other differences were not significant (all ps > .256). The means and confidence intervals for each condition can be seen in Figure 1.

Figure 1 around here.

Data screening revealed that data for the total amount of incorrect details reported, and the accuracy of reported information violated assumptions of normality, therefore Kruskal-Wallis H tests were conducted. A Kruskal-Wallis H test showed no significant difference between conditions in either the number of inaccurate details reported (X^2 (4) = 6.70, p = .153, est. $\mathcal{E}^2$ = .04), or the overall accuracy rate of reported information (X^2 (4) = 5.22, p = .265, est. $\mathcal{E}^2$ = .03).

Discussion

The present study demonstrates the potential of SGCs to produce high-quality cues which can facilitate recall of correct items in a free recall account, particularly in comparison to more generic other-generated cues. We aimed to examine the most effective means of generating high-quality SGCs from a range of candidate techniques. Results indicate that the SGC concept map and SGC event-line were significantly more effective in facilitating the recall of correct details compared to other-generated keywords. In contrast, the SGC keywords only condition did not significantly outperform the other-generated cue condition. There were no differences between the free recall only condition and any other condition. Thus, our hypothesis was partially supported. While there are a number of possible explanations for this pattern of results, we suspect the current findings reflect the importance of cue quality.

Cue quality is likely associated with the techniques deployed in the current study. Specifically, the self-generated cue instructions, and particularly the SGC concept map and SGC event-line conditions, offered the opportunity for multiple retrieval attempts. Our participants freely generated keywords associated with their memory of the witnessed event. They used these keywords in another format (the concept map or event-line structure) and finally saw the free recall instructions. In this sense, these conditions most closely recreated the varied and extensive retrieval opportunities offered by techniques such as the Cognitive Interview (Geiselman *et al.*, 1986). It is possible that more intensive forms of cue generation (such as the event-line or concept map) promote higher levels of task engagement, leading to higher quality cues, and improving recall performance. It is also possible that the structured approach offered by the event-line and concept map offers an advantage in terms of the organization of event knowledge for ease of processing. Both of these approaches have previously been used effectively to represent complex information (Hope *et al.*, 2013; Kinchin, 2000; Kontogianni et al, 2018). Taken together, this suggests high quality free recall instructions can benefit recall performance above more generic cues (e.g. other-generated cues), but that working with those cues in another format such as a concept map or event-line may offer an additional recall benefit.

It is also important to consider why a benefit of SGC keywords only was not seen in this study. Previous research has shown that SGC keywords can enhance recall performance above free recall alone (e.g., Kontogianni *et al.*, 2018). Such studies often follow the original instructions proposed by Gabbert *et al.* (2014) to write down the first six things which come to mind when thinking about the event. Our SGC keywords only condition combined this instruction with the use of feeder headings of person, action, object, and location. This was inspired by category clustering recall (Paulo *et al.*, 2021). Thus, participants in the SGC keywords only condition were asked to generate up to twenty keywords. It is possible that attempting to generate so many keywords reduced the quality of the cues by producing more generic and less diagnostic keywords. By contrast, the SGC concept map and SGC event-line allowed for the unrestricted and unconstrained generation of cues, resulting in cues which were truly self-generated, and which were then organized in a manner which complements the structured nature of memory. This explanation merits further investigation.

Finally, we must consider why the SGC conditions did not significantly differ from the free recall only control condition. It may be a consequence of a ceiling effect due to high levels of accurate recall across all conditions or of lack of power: a post hoc sensitivity analysis suggested sufficient power to detect a medium to large effect (Cohen's $f = 0.27$; $d = 0.54$; $\eta^2 = 0.07$) which means that small real effects may not have been detected. However, it may be more informative to consider the nature of the free recall instructions implemented in the current study. Free recall is generally considered to be a mode of recall which often includes an instruction to 'report everything'. The benefit of this instruction – which was included in our free recall instructions – is based on metamemory principles. People do not report everything that they remember and instead filter the information reported based on task demands, goals and so on (Koriat and Goldsmith, 1996). The instruction not to edit the memory report and to 'report everything' is a key component of the Cognitive Interview (Geiselman *et al.*, 1986). Following the Cognitive Interview and other best practice techniques, our free recall instructions asked that participants provide a complete and accurate report, but avoid guessing (Hope *et al.*, 2011).

Further, and in contrast to more basic free recall instructions, our free recall instructions asked participants to consider each detail of the event (self-generated or otherwise) in turn for around 30 seconds while building a clear image of the detail in the mind's eye. The benefit of this instruction can be understood in terms of the spreading of activation through the memory network suggested by associative network models of memory. Considering details carefully is likely to trigger greater activation of the memory node and so to facilitate the spread of activation throughout the memory network (Collins & Loftus 1975, see Wheeler & Gabbert, 2017 for a review). Our free recall instructions also included an instruction that closing the eyes or looking at a blank wall might increase focus and so help the recall of further details. This technique has been suggested to boost recall of correct details by reducing cognitive load (Vredeveldt *et al.*, 2011) and has been demonstrated in both free and cued recall (Vredeveldt & Penrod, 2013). As such the free recall instructions used in the current study likely promoted both elaboration and cue quality in contrast to more basic instructions which typically provide limited retrieval support and offer only a single uncued recall attempt. Future research might explore this difference further but, in the meantime, it is certainly instructive to know that even carefully formulated free recall instructions can produce reasonable recall outcomes.

As far as we are aware the present work is the first to directly compare different means of self-generating retrieval cues within an eyewitness context. In doing so, our aim was to find the most intuitive (in terms of clear, accessible instructions) and effective (in terms of usability and retrieval benefits) SGC technique. One potential applied benefit of SGCs lies in the ease with which they could be utilised in an investigative interview setting. SGC mnemonics are also consistent with existing best practice guidance, for example note-taking and transferring control from the interviewer to the interviewee (Ministry of Justice, 2022). The use of SGC mnemonics encourages a witness-led approach and allows the interviewee's own words to be used as prompts throughout a structured interview while also effectively facilitating retrieval. The SGC techniques used within the current study were self-administered and took just 30 minutes to complete. This is worth noting given the reported lack of engagement amongst officers with some aspects of the Cognitive Interview, which is at least partially driven by the time and resources needed to administer such mnemonics (Brown *et al.*, 2008; Kebbell *et al.*, 1999). This being the case, it would be of interest to address whether the self-generated cue mnemonics presented here could be effectively trained and implemented by investigating officers as a useful and intutivive addition to an investigative interviewing toolkit.

However, our findings suggest that not all cue generation techniques are equally beneficial. Structured approaches – whether temporal or semantic – seem to offer the greatest benefit to memory. Qualitative differences between the types of details recalled using different SGC techniques should be explored further. Our findings also suggest caution is needed to avoid overburdening the cue generator resulting in less effective cues. While we consider our findings to be consistent with established principles of memory (see Wheeler & Gabbert, 2017), further theoretical and empirical research is necessary to establish the extent of the effectiveness of SGC mnemonic techniques, the boundaries to this effect, and the theoretical underpinnings of this effectiveness.

Conclusions

The present work compares three SGC mnemonic techniques and suggests that, overall, SGC techniques increase the amount of correct information recalled in comparison to other-generated cues. We suggest that this difference is grounded in cue quality, with SGCs providing greater levels of diagnosticity. However, we show that SGC generation techniques are not equally effective and that combining SGCs with structured recall (e.g., an event-line or concept map) is likely to carry the greatest benefit to recall. In this, we echo the findings of Kontogianni *et al.* (2018) on the effectiveness of SGCs and the Timeline Technique and extend these through the addition of the SGC concept map. Our findings also suggest that a high-quality free recall account which makes use of best practice memory techniques is preferable to broader and more generic other-generated cues. However, future research should seek to confirm the effectiveness of these SGC techniques above and beyond high quality free recall.

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Table 1.

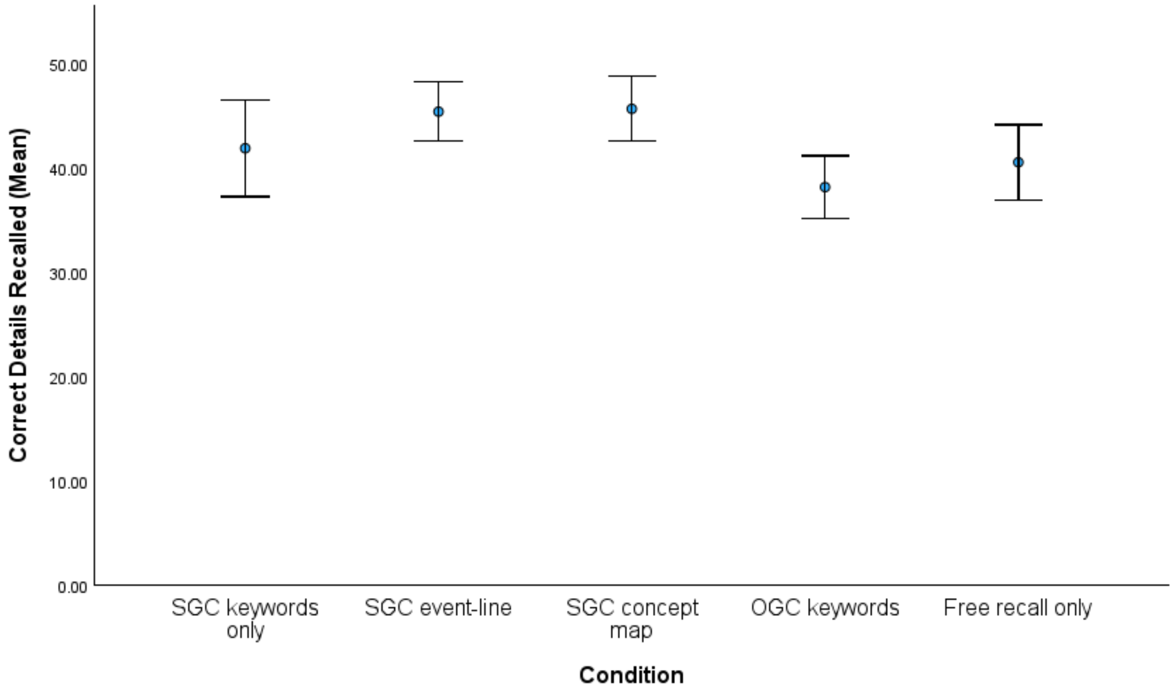
Mean Amount of Information Reported and Accuracy Rates

		Items Recalled		Accuracy Rate
		Correct	Incorrect	(%)
Condition	*n*	*M (SD; SE)* *[95% CI]*	*M (SD; SE)* *[95% CI]*	*M (SD; SE)* *[95% CI]*
Self-Generated Cue Keywords Only	29	41.83 (12.21; 2.27) *[37.18-46.47]*	2.28 (2.30; 0.43) *[1.40-3.15]*	95.12 (4.34; 0.81) *[93.47-96.77]*
Self-Generated Cue Event-line	36	45.33 (8.35; 1.39) *[42.51-48.16]*	2.67 (2.75; 0.46) *[1.74-3.60]*	94.67 (5.10; 0.85) *[92.94-96.39]*
Self-Generated Cue Concept Map	35	45.60 (9.02; 1.52) *[42.50-48.70]*	3.86 (3.06; 0.52) *[2.81-4.91]*	92.48 (5.30; 0.90) *[90.66-94.30]*
Other-Generated Cue Keywords	37	38.11 (8.96; 1.47) *[35.12-41.10]*	2.76 (2.54; 0.42) *[1.91-3.60]*	93.40 (6.07; 1.00) *[91.38-95.42]*
Free recall only	33	40.48 (10.20; 1.78) *[36.87-44.10]*	2.79 (2.37; 0.41) *[1.95-3.63]*	93.96 (4.28; 0.75) *[92.44-95.48]*

Note. Source: Created by author.

Figure 1.

Mean scores and 95% confidence intervals for the correct details recalled by condition.



Note. Error bars represent 95% confidence intervals. Source: Created by author.