The Benefits of a Self-Generated Cue Mnemonic for Timeline Interviewing

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Abstract

Obtaining detailed accounts from individuals who have witnessed complex events under challenging encoding conditions presents a difficulty for investigators. In the present research, participants (*N* = 132) reported their recall of an event witnessed under full or divided attention using a timeline reporting format. Extending the Timeline Technique to assess the relative performance of two additional mnemonics, Self-Generated Cues (SGC) and Other-Generated Cues (OGC), participants provided an account across three Timeline reporting conditions comparing the efficacy of SGC, OGC, and No Cues (control). Mock-witnesses using SGC provided more correct details than mock-witnesses in the OGC or No Cues conditions, under full but not under divided attention conditions. There was no difference between cue conditions with respect to the number of errors reported across attention conditions. Findings show SGC to be a promising addition to interviewing techniques as a retrieval support mnemonic with implications for applied contexts.

Keywords: Information gathering, Timeline, cognitive mnemonics, self-generated cues, memory retrieval, divided attention

General Audience Summary

Reliable information is critical for investigations in forensic and security settings, however obtaining reliable information about complex events can be challenging. In this research, we extend the Timeline Technique, which uses an innovative and interactive procedure where details are reported on a physical timeline. To facilitate remembering we tested two additional mnemonics, Self-Generated Cues (SGC), which witnesses produce themselves, against Other-Generated Cues (OGC) which are suggested by the interviewer. One hundred and thirty-two participants witnessed a multi-perpetrator theft under full or divided attention and provided an account using the Timeline comparing the efficacy of SGC, OGC, and No Cues (control). Mock-witnesses who used Self-Generated Cues provided more correct details than mock-witnesses in the Other-Generated or No Cues conditions, with no cost to accuracy, under full but not under divided attention. Promising results for SGC suggest that this mnemonic might be a useful addition to current interviewing techniques.

The Benefits of a Self-Generated Cue Mnemonic for Timeline Interviewing

Successful criminal and intelligence investigations rely on detailed and accurate information from suspects, witnesses, victims, and informants (Borum, Gelles, & Kleinman, 2009). However, memory for experienced events is fallible and hence, sometimes inaccurate and often incomplete (Frenda, Nichols, & Loftus, 2011; Loftus, 2003). Obtaining high-quality information can become even more difficult in cases of complex multi-perpetrator events witnessed under challenging conditions. Given that 25% of violent crimes committed by strangers involve four or more perpetrators (Office for National Statistics, 2015), and that group involvement is common in terrorist activities (Ozgul, 2016), reporting of multi-perpetrator events is relevant in both forensic and security contexts. To date, only a small body of empirical research has examined ways to improve intelligence gathering practices with calls for more focused contributions in this area (Granhag, Vrij, & Meissner, 2014). The current research extends the Timeline Technique (Hope, Mullis, & Gabbert, 2013), which uses an innovative reporting format to enhance retrieval of complex events, by testing the introduction of a new mnemonic, Self-Generated Cues (SGC), to facilitate recall for multi-perpetrator events witnessed under optimal (full attention) and sub-optimal conditions (divided attention).

Use of Cognitive Mnemonics in Interviewing

The use of mnemonics is already embedded in gold standard investigative interviewing practices. One example is the Mental Reinstatement of Context (MRC) of the Cognitive Interview (CI; Fisher & Geiselman, 1992). ‘Context reinstatement’ capitalizes on the notion that recall increases when there is an overlap between the conditions present at encoding and at retrieval (*encoding-specificity principle*; Tulving & Thomson, 1973; for a review, see Pansky, Koriat, & Goldsmith, 2005). The administration of the MRC mnemonic, which typically elicits more correct information than free recall (e.g., Dando, Wilcock, & Milne, 2009), involves directing interviewees to think back to the surroundings, their emotional state, and their thoughts around the time of the event (Memon, Wark, Bull, & Koehnken, 1997) using pre-defined generic instructions.

Although the encoding-retrieval match appears to aid memory, it is the quality of cues that moderates the extent to which retrieval improves (Nairne, 2002). Cues effectively facilitate retrieval when they are distinctive in addition to satisfying the encoding-retrieval match (Tullis & Benjamin, 2015; Watkins & Watkins, 1975). A distinctive cue uniquely matches a memory to the exclusion of other related memories (*principle of cue overload*; Nairne, 2002). Therefore, to be effective, cues need to be encoded within the context of the witnessed event (*encoding-specificity principle*), and to offer diagnostic information identifying a single target to the exclusion of others, rather than matching multiple related targets (i.e., matching but not distinctive) (Goh & Lu, 2012; Nairne, 2002). To date, research on the efficacy of cues in interviewing has mainly focused on cues generated by an interviewer, such as in the administration of context reinstatement techniques. However, recent work (Wheeler, Gabbert, Hope, Jones, & Valentine, 2017) examined a new mnemonic, Self-Generated Cues (SGC) and found, across two studies, that self-generated cue techniques increased reporting, with no cost to accuracy, in comparison to cues generated by another witness (other-generated cues), or free recall.

Self-Generated Cues are salient details that are actively generated by the individuals themselves and facilitate retrieval of a target memory. When episodic information is recalled, stored traces are activated and these prompt related details, thereby “spreading activation” throughout an associative network (Activation Theory; Anderson, 1983). Every attempt to remember a detail strengthens the memory trace. The stronger the memory, the more likely it is that it will be recalled later and that it will activate associated memories (Anderson, 1983). Similarly, Anderson and Conway (1993) showed that, when asked to list event-details in free recall, participants first listed “distinctive details” (i.e., “details that really stand out and make that memory what it is”, p. 1188). Then they listed other details, highly associated with those distinctive details. Thus, self-generation of distinctive cues can trigger related memories by tapping on a common theme (Anderson & Conway, 1993; Belli, 1998). More recently, Berntsen, Staugaard, and Sørensen (2013) showed that it is possible to activate specific involuntary autobiographical memories in the lab, by manipulating the unique match between cue and item.

In light of Anderson and Conway’s (1993) findings, use of SGC (i.e., the most memorable details), should trigger the retrieval of related event-details while excluding unrelated details, thus satisfying both the encoding-specificity principle (Tulving & Thomson, 1973), and the principle of cue overload (Nairne, 2002). Therefore, the present study tests the effectiveness of SGC in comparison to Other-Generated Cues and No Cues (control) across timeline reporting conditions. To maximize our test of the efficacy of SGC, in the OGC condition, we administered standard MRC instructions as a generic mnemonic (i.e. not generated by the witness). Although MRC instructions do not provide directive cues to specific aspects of an event, they suggest aspects the rememberer might focus on during retrieval. Following Wheeler et al. (2017), we predicted that use of SGC would activate unique associated memories, thus facilitating higher rates of correct recall. To examine the effectiveness of cues, and given previous research showing that accounts can be incomplete despite being accurate (Hope, Gabbert, & Fraser, 2013; Smeets, Candel, & Merckelbach, 2004), we also explored how the use of mnemonics affects account completeness for critical details.

Obtaining information using the Timeline Technique

The Timeline Technique (Hope et al., 2013) uses a reporting format with a physical timeline to facilitate retrieval of multi-perpetrator events. In Hope et al. (2013), the Timeline Technique elicited more accurate information than free recall for a multi-perpetrator event and enhanced the reporting of connections between perpetrators and actions, at immediate testing and after a two weeks' delay. Importantly, instead of asking for a linear narrative of the events, the timeline format encourages witness-compatible reporting whereby interviewees can report events as they remember them, at any point of the timeline, and re-arrange details if necessary. The current study combines this reporting format with the distinctiveness of SGC to extend the Timeline Technique and evaluate a novel mnemonic.

Attention and eyewitness memory

Given the role of attention for successful encoding of witnessed events (for a review, see Pansky et al., 2005), a secondary aim was to examine recall under different encoding conditions. When witnessing a real crime, the experience of stress or physiological arousal can divert attention to aspects of the scene and/or to internal thoughts (Lane, 2006). However, laboratory studies typically use optimal conditions where participants pay full attention (FA) to events, thus possibly overestimating witnesses' memory performance (Ihlebaek, Løve, Eilertsen, & Magnussen, 2003). Although there is some evidence of enhanced recall using cued versus free recall when attention is divided (DA) at encoding (Backman & Nilsson, 1991), many studies have shown that DA has a robust negative effect on later remembering across stimuli (e.g., word lists, actions, pictures etc.; e.g. Craik, Govoni, Naveh-Benjamin, & Anderson, 1996; Mulligan, 2014; Naveh-Benjamin, Kilb, & Fisher, 2006). Using a mock-witness paradigm, Lane (2006) also found that DA at encoding resulted in lower accuracy and greater suggestibility to misinformation.

Based on Activation Theory (Anderson, 1983) and given previous positive results for cued versus free recall under DA (Backman & Nilsson, 1991), we predicted that use of SGC should enhance retrieval of even weakly encoded traces through the activation of memorable and associated details. Although witnesses under DA conditions were expected to provide less information overall, indicating poorer episodic memory, we hypothesised that witnesses in the SGC condition would provide more correct information (cf. OGC and No Cue conditions) under both encoding conditions.

Method

Participants and Design

A G*Power statistical analysis (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a sample of 132 participants was required for a 95% chance of detecting a large effect size (Cohen, 1992). A total of 135 participants were recruited through the department's participation pool and through advertisements on the university campus. Participants were randomly allocated to a 3 (Mnemonic type: Self-Generated Cues vs Other-Generated Cues vs No Cues) x 2 (Attention at encoding: Divided Attention vs Full Attention) between-subjects design. Data were excluded for three participants who, respectively, did not meet the English fluency criterion, did not follow the instructions in the divided attention task, and experienced an unanticipated interruption during reporting. The reported analyses are based on the data for the remaining 132 (85 females; 18-59 years of age; M_{age} = 25 years, SD = 8.91) participants, with 22 participants allocated per group cell (SGC x FA; SGC x DA etc.).

Materials

Stimulus event. Consistent with Hope et al. (2013), the stimulus event was a multi-perpetrator short film lasting 1 min 20s. The event showed an assault and robbery by five male perpetrators against a female victim. The film starts with three males loitering by a parked car. Two other males join them. A woman walks toward the group carrying a laptop computer bag and tries to walk past them. They surround her and one male is seen threatening her with a crowbar. Her bag is taken from her and passed between several perpetrators, while another perpetrator films the incident on his cell phone. At the end of the event, the perpetrators run away with the bag. Although there was an audio component to the video stimulus, this was mainly background traffic / outdoor noise. The content of what was said by the gang members was inaudible (in all conditions) and, as such, would not offer any additional information about the incident or actions performed.

Divided attention task. Participants allocated to the divided attention condition listened to an audio recording of a series of numbers and were instructed to respond by pressing a key when an even number was heard (adapted from Naveh-Benjamin et al., 2006) while they watched the stimulus event. The number of correct responses (hits) and reaction times to the auditory task were recorded to verify that participants attended to the distraction task as instructed. Participants who performed at lower than 50% success at the task (from a total of 18 hits) were to be excluded from analysis, however no participants had to be excluded on this basis. As noted, one participant was excluded for not following the instructions (i.e. pressing a key to every number and not to even numbers only).

Timeline Technique. The Timeline Technique consists of three elements: (1) a physical cardboard timeline (33 in. x 12 in.) that has a horizontal line running at mid-point from one end of the card to the other representing the temporal context during which the event occurred; (2)

blank, white, lined person description cards (5 in. x 3 in.); (3) blank yellow action cards with a semi-adhesive strip on the back (3 in. x 3 in.) for easy removal and rearrangement on the cardboard timeline.

Other-Generated Cues Instructions. Participants in the Other-Generated Cues condition were administered a version of Mental Reinstatement of Context (MRC) instructions. Consistent with the standard administration of MRC, participants were instructed to think back to when they witnessed the event, to think about what they could see, what they could hear, what the surroundings were, and what they were thinking and feeling at the time. Participants were encouraged to consider whether each prompt helped them remember other things that occurred in the event. Participants were also invited to close their eyes or look at a blank wall if it helped them concentrate (Dando, Wilcock, & Milne, 2009).

Self-Generated Cues instructions. The instruction in the SGC condition was adapted from Gabbert, MacPherson, and Hope (2014). Participants were instructed to write down the first six things that they remembered seeing or thinking when viewing the event and to then focus on each of these things one at a time, considering for each whether or not that memory helped them remember other parts of the event. Participants were also encouraged to close their eyes or look towards the wall to focus.

Procedure

Half of the participants watched the stimulus event while the other half watched the stimulus event and simultaneously performed the auditory distraction task. All participants were given the following instruction prior to watching the stimulus: “During the study, you will watch a video of a crime event. Please pay attention because later you will be asked to provide an account of the event.” Participants in the DA condition also received the following instruction:

"While you watch the video you will also listen to an audio recording of a series of numbers through the headphones. Please press the "enter" key on the keyboard every time you hear an even number".

After witnessing the event, all participants completed a 10-minute filler task (Sudoku puzzle). They were then moved to a different room and were given instructions for reporting their account of what happened in the event using the timeline reporting format and the instructions used in Hope et al. (2013). Participants in all conditions were told to report all the details about the event and the people involved that they remember, without guessing. Participants were instructed on how to use the person description cards to provide information about the people involved by using a new card per each individual. They were also instructed to use action cards to describe any actions and information about the sequence of the events. The instructions further advised that they should place all the cards on the timeline format in order, with links between the individuals reported and each action to show "who did what and when". Depending on condition, participants also received instructions to use Mental Reinstatement of Context, or the Self-Generated Cues. Participants in the No Cues (control) condition did not receive any further instructions and simply reported their account using the original Timeline Technique reporting instructions. Participants were left alone in the room while providing their account by completing the timeline format, although the researcher was available nearby to answer any questions if necessary. Participants were not asked any questions about the witnessed event by the interviewer. All participants were video-recorded while generating their accounts. After participants finished providing their account, they were thanked and debriefed.

Coding

The details reported by the participants on the person and action cards and placed on the timeline format were then coded according to the scoring template used in Hope et al. (2013). Briefly, each detail reported was identified as a Person (P), Action (A), Object (O) and Setting (S) detail. A detail was scored as accurate if it was present in the stimulus event and described correctly. Details that were subjective or vague were not coded for accuracy. A secondary coding was conducted regarding the accuracy of attributions of the reported actions to specific actors. Person-action details were scored as correct when an action was correctly attributed to a specific actor (e.g., Male 3 raises the crowbar). Moreover, sequencing errors were noted when events were reported in the wrong order. For instance, if ABCD is correct, in ACBD, C would be coded as one sequence error as it should follow B, but B would not be counted as out of sequence too. Therefore, this example reflects a total of one sequence error.

Finally, the reporting of critical details was coded according to the process described in Smeets et al. (2004), which resulted in a list of 24 critical details [a detailed description of the coding is provided in the supplementary materials]. To assess overall inter-rater reliability, 20 interviews were randomly selected and coded independently by a rater blind to experimental conditions. Inter-rater reliability was high, *ICC* = .98, 95% CI [.967, .988] across coding categories.

Results

Bonferroni-corrected pairwise comparisons were conducted for all interactions. In the interests of parsimony, we only report pairwise comparisons where they indicate significant differences (even for non-significant interactions). Where Bonferroni-corrected pairwise comparisons are not significant (and therefore do not aid interpretation beyond the non-significant interactions), they are not reported.

Reporting of Correct Details

A between-subjects ANOVA showed a significant main effect of Cues, $F(2,126) = 4.39$, $p = .014$, $\omega^2 = .049$, for the number of correct details reported. Post hoc tests showed that, across attention conditions, more correct details were reported in the Self-Generated Cues condition than in the No Cues condition ($p = .012$). The number of correct details reported in the Other-Generated Cues condition did not differ from the number of correct details reported in the Self-Generated Cues ($p = .241$) and No Cues ($p = .718$) conditions. There was also a main effect of Attention, $F(1, 126) = 24.78$, $p < .001$, $\omega^2 = .156$, with significantly more correct details reported in the Full attention condition than in the Divided attention condition. The interaction between Attention and Cues was not significant, $F(2,126) = 2.23$, $p = .111$, $\omega^2 = .018$. Bonferroni-corrected pairwise comparisons showed that more correct details were reported in the Self-Generated Cues condition than in either the Other-Generated Cues ($p = .046$) or No Cues ($p = .002$) condition, under full attention, while there was no difference between conditions under divided attention ($p = 1.00$). Results for the number of incorrect details are reported in supplementary materials.

The effect of cues on the mean number of correct details reported within Full and Divided attention conditions are presented in Figure 1.

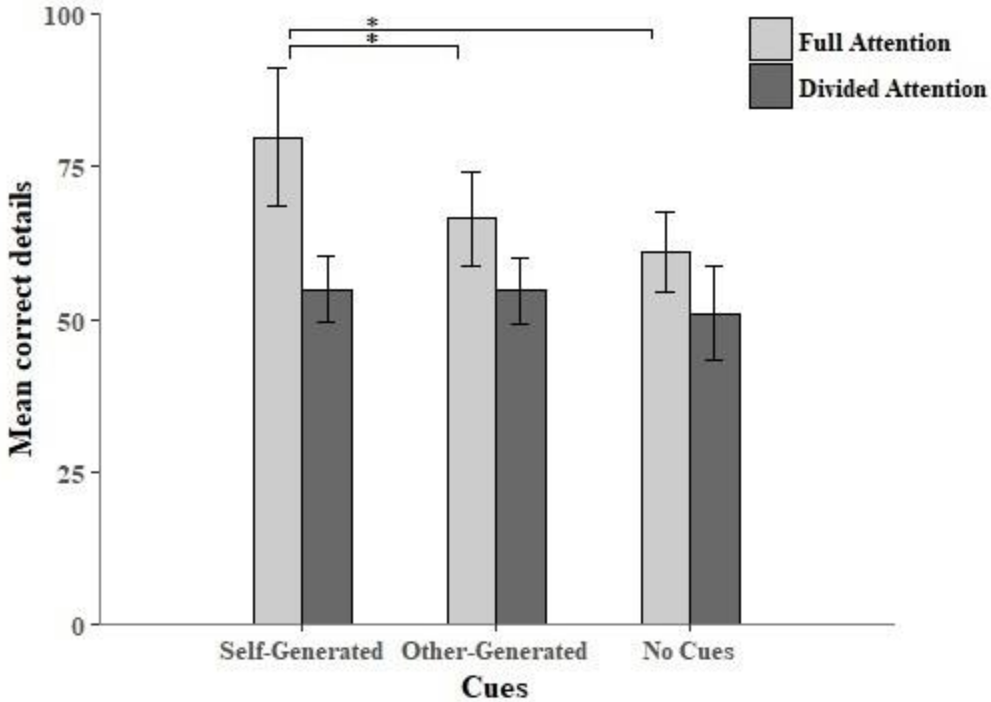

Figure 1. Mean number of correct details reported as a function of cues (Self-Generated Cues vs Other-Generated Cues vs No Cues) within Full and Divided attention conditions. Error bars represent ± 1.96 standard errors (95% confidence intervals). Asterisks indicate significant differences between cue conditions, $*p < .05$.

Accuracy Rate of Reported Details

Accuracy rate was calculated by dividing the number of correct details by the sum of both correct and incorrect details (total number of items) to obtain the proportion of accurate reported information. Levene’s test was significant ($p = .004$). A boxplot showed that the distribution was not symmetrical but negatively skewed with two outliers who had particularly low scores. However, given the overall robustness of the test, no action was taken. Analysis revealed a significant main effect of Attention, $F(1, 126) = 10.37$, $p = .002$, $\omega^2 = .068$, with higher accuracy rates in the Full (cf. Divided) attention condition. There was also a main effect of Cues, $F(2,126) = 3.43$, $p = .035$, $\omega^2 = .036$, on accuracy rates. Post hoc tests with a Bonferroni adjustment showed that across attention conditions, there was no significant difference between the accuracy rate in the Self-Generated Cues condition and the accuracy rate in the Other-Generated Cues (p = 1.00) or No Cues conditions (p = .188). However, the accuracy rate in the Other-Generated Cues condition was significantly higher than the rate in the No Cues (p = .039) condition. The interaction was not significant, F(2,126) = .63, p = .536, ω^2 = -.005. Bonferroni-corrected pairwise comparisons showed that there was no significant difference in accuracy rates between Self-Generated Cues and Other-Generated Cues conditions (p = 1.00), Self-Generated Cues and No Cues conditions (p = .783) or Other-Generated Cues and No Cues conditions (p = .932) under full attention. Under divided attention, there was a significantly higher accuracy rate in the Other-Generated Cues condition compared to the No Cues condition (p = .036), however there was no significant difference between accuracy rates in the Self-Generated Cues and Other-Generated Cues conditions (p = .388)

Attribution of Actions

With respect to correct person-action details, there was a significant main effect of Attention, F(1, 126) = 8.94, p = .003, ω^2 = .058, but not of Cues, F(2,126) = .003, p = .997, ω^2 = -.007. The interaction between Attention and Cues was not significant, F(2,126) = .21, p = .814, ω^2 = -.012. Results for incorrect person-action details are reported in supplementary materials. The main effects for correct person-action details are presented in Figure 2.

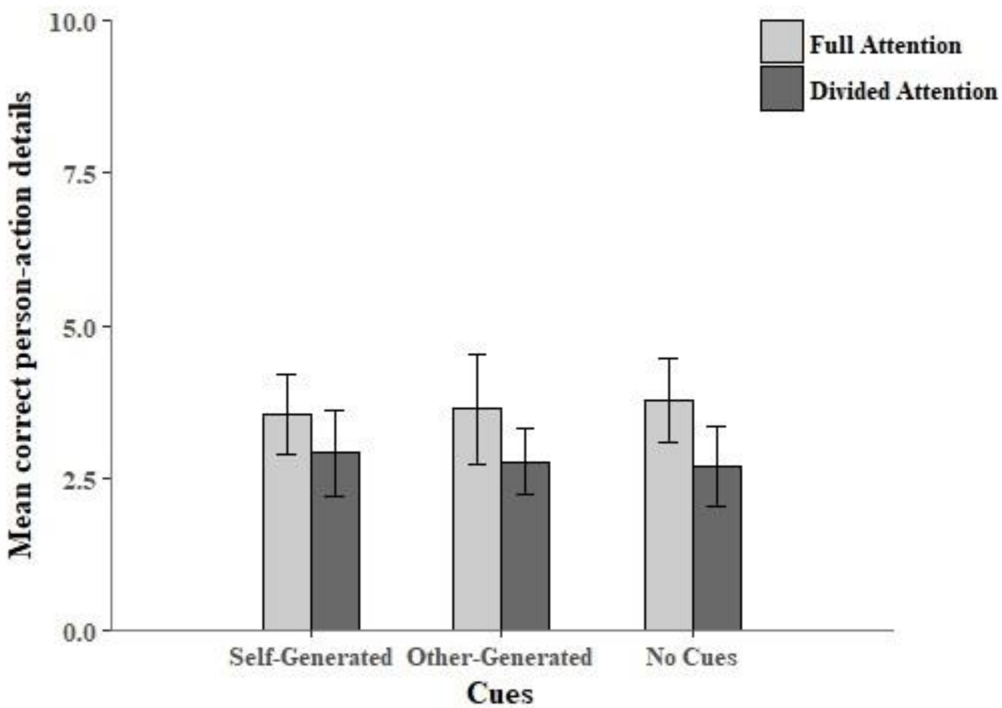

Figure 2. Mean number of correct person-action details as a function of cues (Self-Generated Cues vs Other-Generated Cues vs No Cues) and attention (Full vs Divided attention). Error bars represent ± 1.96 standard errors (95% confidence intervals).

Accuracy Rate of Person-Action Details

With respect to the accuracy rate of person-action details, there was no significant main effect of Attention, $F(1, 126) = 2.08$, $p = .152$, $\omega^2 = .008$, or Cues, $F(2,126) = .10$, $p = .910$, $\omega^2 = -.014$. The interaction was also not significant, $F(2,126) = 2.77$, $p = .066$, $\omega^2 = .026$.

Sequence errors

There was a main effect of Attention $F(1,126) = 4.19$, $p = .043$, $\omega^2 = .024$, but not of Cues, $F(2, 126) = .029$, $p = .971$, $\omega^2 = -.015$ on the total number of sequence errors reported by participants. The interaction between Attention and Cues for the total number of sequence errors reported by participants was significant, $F(2,126) = 3.75$, $p = .026$, $\omega^2 = .040$. Pairwise comparisons showed that there were significantly more sequence errors made with the use of Other-Generated Cues under Full attention (*M* = .55, SE = .05) compared to the Divided attention condition (*M* = .05, SE = .02) ($p = .001$). However, there was no difference between attention conditions for the number of sequence errors made in the Self-Generated Cues ($p = .377$) and No Cues ($p = .556$) conditions. Levene's test was significant for the analysis of sequence errors ($p < .001$). Since the values in the reporting of sequence errors were overall very low (*M* = .30, SD = .52), no action was taken to recover the assumptions violation. Instead, emphasis was given to the fact that the overall mean number of sequence errors was low.

Results for the effects of Cues and Attention on the reporting of critical details and detail type (person, action, object, setting) are reported in the supplementary materials.

Discussion

We tested the effectiveness of cognitive mnemonics used in conjunction with the Timeline Technique under full and divided attention. As predicted, mock-witnesses who used Self-Generated Cues (SGC) reported more correct details than mock-witnesses in Other-Generated and No Cue conditions, at no cost to accuracy. However, this enhanced performance with SGC was only observed under full attention. Participants under divided attention consistently reported less correct information than those under full attention, and there was no effect of cues under divided attention.

The apparent lack of benefit of SGC under divided attention is noteworthy. The sizeable main effect of the divided attention task across cue conditions suggests that performing a secondary task significantly challenged attentional processes and likely drew participants' attention away from the target event, thus restricting encoding and retrieval (see also Marsh et al., 2017, for a similar DA effect when participants were instructed to ignore distractions). These findings are consistent with literature on the powerful effect of divided attention on remembering (e.g., Craik et al., 1996) and, although it is not surprising that our task restricted encoding (as intended), it is possible that the to-be-remembered information was not stored from the outset, thus hindering retrieval despite the additional support of cues. Another possibility is that the SGC manipulation was simply not powerful enough to access weakly encoded memories. Given that research on the effectiveness of memory-enhancing techniques under sub-optimal encoding conditions is limited, more research is needed to determine the most likely explanation. Research should also examine the effectiveness of SGC possibly with more naturalistic divided attention measures, such as using a smartphone or conversing (e.g. Marsh et al., 2017), to delineate the limitations of the use of cues.

Nevertheless, mock-witnesses reported more correct information under full attention with SGC than with OGC. Possibly, the use of SGC facilitated retrieval more effectively across the whole event by activating the “stronger” memories (Anderson, 1983) that distinctively identify associated targets (Nairne, 2002). It is also possible that initially identifying six event-details and processing them further might contribute to the SGC advantage. By comparison, Other-Generated Cues, administered here in the form of generic context-retrieval cues, failed to activate as many event-details. Further research is needed to increase understanding about the underlying mechanisms of SGC relative to more generic cues (e.g., OGC).

Another caveat to our finding of superior performance by SGC is that there was no effect of cues on the reporting of critical details. Overall, only 50% of the critical details identified by legal professionals were reported across conditions, suggesting that even highly accurate and detailed accounts can be lacking in information relevant to investigators (see Hope et al., 2013; Smeets et al., 2004). Notably, most of these critical details related to specific details of the assault. It is possible that mock-witnesses did not appreciate the level of detail required or that, given the brevity of the event, such details were poorly encoded or simply not salient for participants and, therefore, not prompted by the SGC. Future research might examine whether follow-up questioning facilitates the reporting of such details.

Regarding person-action links, there was no effect of cues on the number of correct attributions of actions. Accounts of witnesses using SGC or OGC did not include more person-action details than accounts of witnesses in the control condition, who only used the Timeline Technique. Therefore, the use of mnemonics did not increase the reporting of person-action details. Thus, features of the Timeline Technique (likely the use of different person and action cards and the instruction to show "who did what when") possibly drove the reporting of person-actions details. Indeed, in Hope et al. (2013) reporting of person-action details did not differ between participants when using the Timeline Technique to participants using person and action cards only (Experiment 2). Given that SGC increased retrieval of correct information overall, but did not improve the reporting of person-action details compared to use of the timeline alone, it may be worth exploring whether SGC and timeline capitalize on different retrieval processes to access different types of information.

Although our expectations about the benefit of SGC across encoding conditions were not fully met, the results of SGC in the full attention condition are promising. Notably for applied contexts where person descriptions are valuable in investigations (Brown, Lloyd-Jones, & Robinson, 2008; Gabbert & Brown, 2015), witnesses who used SGC reported more person details compared to other conditions, with person details being reported to a greater extent than any other details.

Current findings suggest that, when attention at encoding has not been compromised, Self-Generated Cues may be a useful addition to interviewing techniques as a retrieval support mnemonic that promotes witness-led interviewing. In intelligence gathering, interviewers may be unaware of what information interviewees possess and what is memorable to each interviewee. Accordingly, the use of SGC may support the interviewing process by facilitating an open-ended, largely self-administered report. Not only does this approach allow witnesses to report event-details in their own words; it also limits the potential for use of inappropriate or leading questions.

Author contributions

First and second author conceived the research idea. First author designed, conducted, and analysed the research and wrote the research paper. Second, third, fourth, and fifth authors provided feedback on the research and reviews on the research paper.

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Supplementary Materials

In this Supplementary Materials section, we provide information about coding and analyses for variables which are conventional in this research area (e.g. reporting of incorrect details) but which lie outside our main hypotheses.

1. Critical Details Coding

Prior to data collection, six legal professionals viewed the stimulus event and independently provided a list of details that they considered critical to pursue an investigation of the assault and relevant legal charges. Details mentioned by at least four of the six legal professionals were included in a final list of 24 critical details. Accounts were then coded for the reporting of these critical details. To calculate a completeness rate for critical details, the total of reported critical details was divided by 24 (i.e. the maximum number of critical details). Higher scores indicated higher levels of completeness.

2. Supplementary Results (main results reported in manuscript)

Reporting of Incorrect Details

There was no significant main effect of Cues, $F(2,126) = 1.10$, $p = .337$, $\omega^2 = .001$, or Attention, $F(1, 126) = .08$, $p = .777$, $\omega^2 = -.007$, on the total number of incorrect details reported. The interaction between Attention and Cues was not significant, $F(2,126) = .23$, $p = .793$, $\omega^2 = -.012$. Means for incorrect details reported as a function of cue and attention conditions are presented in Table 1.

Table 1. *Mean number (SE) of incorrect details by cues (Self-Generated Cues, Other-Generated Cues, No Cues) and attention (Full and Divided).*

	Incorrect details					
	SGC		OGC		NC	
Attention	*M (SE)*	95%CI	*M (SE)*	95%CI	*M (SE)*	95%CI
Full	9.9 (0.5)	[7.5, 12.3]	9.3 (0.7)	[6.6, 12.4]	11 (0.6)	[7.6, 13.6]
Divided	10.1 (0.4)	[8.3, 11.9]	8.7 (0.3)	[7.1, 10.4]	11.6 (0.7)	[8.6, 14.7]

Reporting of Incorrect Action Attributions

There was no effect of either Attention, $F(1, 126) = 0$, $p = 1.00$, $\omega^2 = -.008$, or Cues, $F(2,126) = .74$, $p = .479$, $\omega^2 = -.004$, on the total number of incorrect person-action details. No significant interaction emerged between Cues and Attention, $F(2,126) = 2.01$, $p = .138$, $\omega^2 = .015$. Means for incorrect person-action details reported as a function of cue and attention conditions are presented in Table 2.

Table 2. *Mean number (SE) of incorrect person-action details by cues (Self-Generated Cues, Other-Generated cues, No Cues) and attention (Full and Divided).*

	Incorrect Person-Action details					
	SGC		OGC		NC	
Attention	*M (SE)*	95%CI	*M (SE)*	95%CI	*M (SE)*	95%CI
Full	0.86 (0.1)	[0.53, 1.21]	1.5 (0.1)	[0.91, 2.32]	1.05 (0.1)	[0.56, 1.56]

Divided	1.05 (0.1)	[0.58, 1.54]	0.91 (0.1)	[0.54, 1.35]	1.45 (0.1)	[0.95, 2.00]

Reporting of Critical Details

The mean number of reported critical details across conditions was 12 (*SD* = 2.9) out of a total of 24 details. There was a significant main effect of Attention on the total number of reported crime-related details, $F(1, 126) = 28.00$, $p < .001$, $\omega^2 = .174$, but there was no main effect of Cues, $F(2,126) = .06$, $p = .940$, $\omega^2 = -.014$. No significant Attention by Cue interactions emerged for reported critical details, $F(2,126) = .51$, $p = .600$, $\omega^2 = -.008$. Finally, there was a significant main effect of Attention, $F(1, 126) = 28.48$, $p < .001$, $\omega^2 = .176$, but not Cues, $F(2,126) = .05$, $p = .954$, $\omega^2 = 0.014$, on the rate of completeness of participants' accounts. The interaction between Attention and Cues was not significant for the rate of completeness, $F(2,126) = .44$, $p = .647$, $\omega^2 = -.009$. Means for reported critical details as a function of cue and attention conditions are presented in Table 3.

Table 3. *Mean number (SE) of reported critical details by cues (Self-Generated Cues, Other-Generated cues, No Cues) and attention (Full and Divided).*

	Reported details					
	SGC		OGC		NC	
Attention	*M (SE)*	95%CI	*M (SE)*	95%CI	*M (SE)*	95%CI
Full	13.1 (0.2)	[12.2, 14.1]	12.7 (0.2)	[11.8, 13.5]	12.9 (0.2)	[11.9, 14]
Divided	10.3 (0.2)	[9.3, 11.6]	10.9 (0.3)	[9.6, 12]	10.2 (0.3)	[8.8, 11.6]

Type of Details Reported

There was a main effect on the total number of person details for Attention, $F(1, 126) = 14.55$, $p < .001$, $\omega^2 = .095$, with more person details reported under full than divided attention. There was also a main effect of Cues, $F(2,126) = 4.91$, $p = .009$, $\omega^2 = .057$. Post-hoc tests showed that more person details were reported overall with SGC than with No Cues ($p = .011$), but not compared to the Other-Generated Cues condition ($p = .061$). There was also no significant difference in the number of person details reported in the Other-Generated Cues condition in comparison to the No Cues condition ($p = 1.00$). No significant interaction emerged for the total number of person details, $F(2,126) = 1.40$, $p = .251$, $\omega^2 = .006$. Bonferroni-corrected pairwise comparisons revealed that the use of Self-Generated Cues led to the reporting of more person details comparing to the use of Other-Generated Cues ($p = .039$) and of No Cues ($p = .005$), under the Full attention condition. However, there was no difference between cues under Divided attention conditions ($p > .05$).

There was a main effect of Attention, $F(1, 126) = 8.64$, $p = .004$, $\omega^2 = .056$, but not of Cues, $F(2,126) = .24$, $p = .788$, $\omega^2 = -0.011$, on the total number of object details reported. There was no significant interaction between Cues and Attention, $F(2,126) = 1.32$, $p = .272$, $\omega^2 = .005$. Similarly, there was a main effect of Attention, $F(1, 126) = 15.57$, $p < .001$, $\omega^2 = .102$, but not of Cues, $F(2,126) = .03$, $p = .966$, $\omega^2 = -0.015$, on the total number of action details reported. The interaction between Attention and Cues was not significant, $F(2,126) = 1.01$, $p = .366$, $\omega^2 = .000$. Levene's test was significant for the analysis of action details ($p = .03$). Finally, there was no effect of Attention, $F(1, 126) = .62$, $p = .434$, $\omega^2 = -.003$ or Cue, $F(2,126) = 2.86$, $p = .061$, $\omega^2 = .028$, on the total number of setting details reported. Levene's test was significant ($p = .005$). No significant interaction emerged for the reporting of setting details, $F(2,126) = .70$, $p = .499$, $\omega^2 =$

-.005. Boxplots were used to explore the distribution for the total number of both action and setting details. For action details, the distribution was symmetrical however there were seven outliers representing participants who reported a high number of action details. For setting details, the distribution was not symmetrical but positively skewed with three outliers who reported a high number of setting details. Given the low number particularly regarding setting details (M = 6.88, SD = 3.58), and the lack of significant results for both type of details, no action was taken due to the Levene's test being significant. The effect of cues on the mean number of person details within Full and Divided attention conditions are presented in Figure 1. Means for action, object and setting details reported within both attention conditions are presented in Tables 4a and 4b.

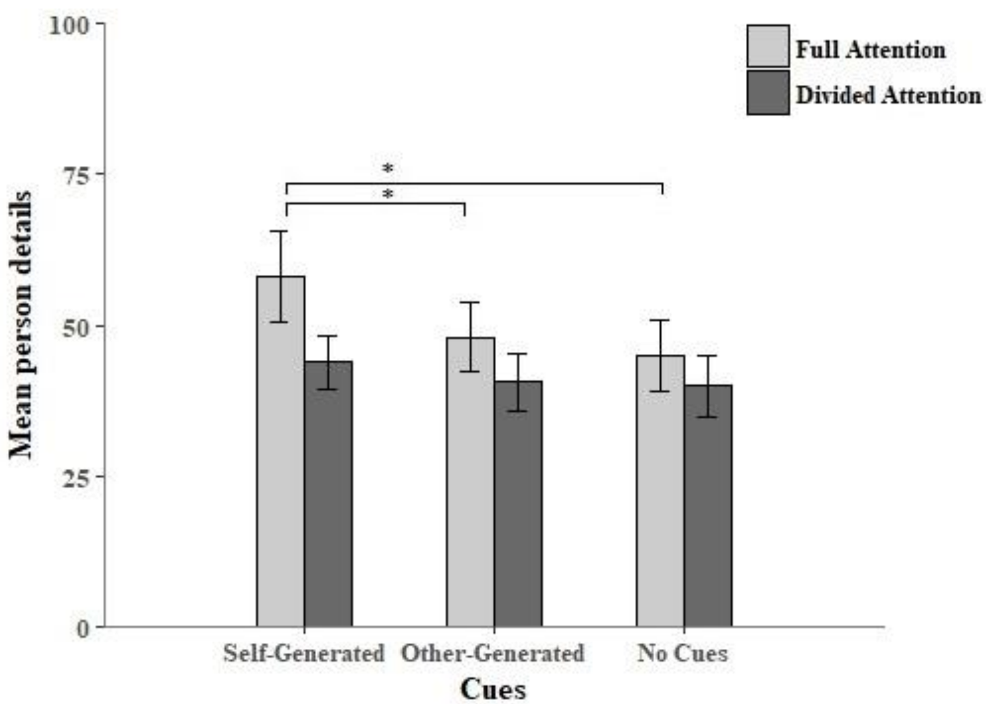

Figure 1. Mean number of person details as a function of cues (Self-Generated Cues vs Other-Generated Cues vs No Cues) within Full and Divided attention conditions. Error bars represent ±

1.96 standard errors (95% confidence intervals). Asterisks indicate significant differences between cue conditions, * $p < .05$.

Table 4a. Mean (SE) number of action, object and setting details by cues (Self-Generated Cues, Other-Generated Cues, No Cues) under Full attention.

	Full Attention					
	SGC		OGC		NC	
Details type	*M (SE)*	95%CI	*M (SE)*	95%CI	*M (SE)*	95%CI
Action	18.4 (0.6)	[15.5, 21.3]	18.1 (0.8)	[14.6, 21.6]	16.3 (0.6)	[13.8, 19.1]
Object	10 (0.3)	[8.7, 11.3]	9.2 (0.3)	[7.8, 10.7]	9.2 (0.3)	[8.1, 10.4]
Setting	8.4 (0.4)	[6.3, 10.4]	7.2 (0.4)	[5.5, 9.1]	5.8 (0.2)	[4.9, 6.7]

Table 4b. Mean (SE) number of action, object and setting details by cues (Self-Generated Cues, Other-Generated Cues, No Cues) under Divided attention.

	Divided Attention					
	SGC		OGC		NC	
Details type	*M (SE)*	95%CI	*M (SE)*	95%CI	M (SE)	95%CI
Action	12.3 (0.4)	[10.5, 14.2]	12.9 (0.4)	[10.8, 14.9]	14 (0.5)	[11.6, 16.5]
Object	7.2 (0.2)	[6, 8.4]	8.6 (0.2)	[7.5, 9.8]	7.7 (0.4)	[6, 9.5]
Setting	7.3 (0.3)	[6, 8.5]	6.3 (0.2)	[5.3, 7.3]	6.3 (0.3)	[4.9, 7.9]