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The Effectiveness of Eye-Closure in Repeated Interviews

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Abstract

Purpose. Closing the eyes during recall can help witnesses remember more about a witnessed event. The present study examined the effectiveness of eye-closure in a repeated-recall paradigm with immediate free recall followed one week later by both free and cued recall. We examined whether eye-closure was more or less effective during the second free recall attempt compared to the first, whether eye-closure during the first recall attempt had an impact on subsequent free and cued recall performance, and whether eye-closure during the second free recall could facilitate the recall of new, previously unreported, information (reminiscence).

Method. Participants witnessed a videotaped event and participated in a first free recall attempt (with eyes open or closed) a few minutes later. After a week, they provided another free recall, followed by a cued-recall interview (with eyes open or closed).

Results. Eye-closure during the first free recall attempt had no significant effect on performance during any of the recall attempts. However, eye-closure during the second session increased the amount of correct visual information reported in that session by 36.7% in free recall and by 35.3% in cued recall, without harming testimonial accuracy. Crucially, eye-closure also facilitated the recall of new, previously unreported visual information.

Conclusions. The findings extend previous research in showing that the eye-closure instruction can still be effective when witnesses are interviewed repeatedly, and that it can facilitate the elicitation of new information. Thus, the eye-closure instruction constitutes a simple and time-efficient interview tool for police interviewers.

Keywords: eyewitness memory, eye-closure, repeated recall, reminiscence, investigative interviewing, grain size

The Effectiveness of Eye-Closure in Repeated Interviews

While trying to retrieve a distant memory, people often close their eyes or look at the sky. Research has shown that this behaviour is functional: when adults and children are instructed to close their eyes, they perform better on tests involving general knowledge, mathematics, verbal reasoning, and visuospatial imagination (Glenberg, Schroeder, & Robertson, 1998; Markson & Paterson, 2009; Phelps, Doherty-Sneddon, & Warnock, 2006). Closing the eyes during an investigative interview also helps eyewitnesses remember more about witnessed events (Mastroberardino, Natali, & Candel, 2012; Perfect et al., 2008; Wagstaff et al., 2004). Findings regarding the role of modality of the to-be-remembered information in the eye-closure effect have been somewhat mixed. Some studies showed equivalent benefits for both visual and auditory details (e.g., Perfect et al., 2008, Experiments 4 and 5; Vredeveldt & Penrod, 2012, free recall), whereas others showed that eye-closure improves recall of visual, but not auditory details (e.g., Perfect et al., 2008, Experiment 2; Vredeveldt, Baddeley, & Hitch, 2012; Vredeveldt & Penrod, 2012, cued recall). Integrating these findings, Vredeveldt, Hitch, and Baddeley (2011) proposed that eye-closure improves memory because (a) it reduces cognitive load, and (b) it eliminates modality-specific interference from visual distractions in the interview environment.

Visualization seems to be one of the key processes underlying the eye-closure effect. To illustrate this point, consider an example. When asked what one paid for the groceries at the self-service check-out yesterday, one could reply with a coarse-grain answer (e.g., “between $30 and $40”) or with a fine-grain answer (e.g., $34.72; cf. Goldsmith, Koriat, & Weinberg-Eliezer, 2002, for more on grain size). Although both answers require retrieval of information obtained through a visual source (assuming that the self-service check-out does not have auditory output), we suspect that the fine-grain answer involves a greater degree of visualization than does the more conceptual coarse-grain answer. Interestingly, Vredeveldt and colleagues (2011) found that eye-closure facilitated retrieval of fine-grain but not coarse-grain information. This is in line with studies showing that eye-closure facilitates spontaneous visual imagery of hypothetical scenarios (Caruso & Gino, 2011), and increases activation in brain regions associated with visual imagery (Wais, Rubens, Boccanfuso, & Gazzaley, 2010). In sum, because eye-closure promotes visualization of events, we predicted that it would be most effective for information that can readily be visualized (i.e., fine-grain visual information).

In real life, witnesses are often asked to provide testimony on multiple occasions (La Rooy, Lamb, & Pipe, 2009; Odinot, Wolters, & Lavender, 2009). Therefore, the present study examined whether eye-closure was effective in a repeated-interviewing paradigm. Participants viewed a videotaped event and were asked to provide a free recall a few minutes later and again a week later. The second free recall was followed by cued recall, allowing for an experimental manipulation of the modality of the requested information and for an analysis of the grain size of provided responses. Participants were instructed to close their eyes: (a) during both sessions; (b) during neither session; (c) only during the first session; or (d) only during the second session.

The research design made it possible to compare the effectiveness of eye-closure during the first and the second free recall attempt. We formulated two competing hypotheses regarding this question, because recall performance during the second free recall could potentially be affected by the intervening delay, but also by the previous recall attempt itself. First, because the second free recall took place after a week's delay, it may have been difficult for participants to retrieve information about the event. For instance, Lipton (1977) found that a one-week delay reduced the amount of information reported about a filmed murder by 18%. If participants had more difficulty retrieving the information after a delay, then we would expect any memory-enhancing tool to be more effective. For instance, Larsson, Granhag, and Spjut (2003) found that the Cognitive Interview (i.e., an interview procedure incorporating various mnemonic techniques, including eye-closure; see Fisher & Geiselman, 1992, for more information) helped children to remember 29% more event details after a short delay, but 58% more after a longer delay. Thus, one hypothesis was that eye-closure would be more effective during the second free recall than during the first.

However, previous research on the *testing effect* has shown that the act of testing one's memory can improve performance on a subsequent memory test (Carrier & Pashler, 1992; Roediger & Karpicke, 2006). Indeed, studies on eyewitness recall have shown that intervening delays often do not reduce the amount of information recalled if witnesses have been given an earlier opportunity for recall (Burke, Heuer, & Reisberg, 1992; Flin, Boon, Knox, & Bull, 1992, adult data; Turtle & Yuille, 1994). If an initial recall attempt "locks" the memory trace in place (cf. Burke et al., 1992), then eye-closure may not be effective during a second recall attempt. Hence, an alternative hypothesis was that eye-closure would be more effective during the first free recall than during the second.

The most important goal of introducing multiple recall attempts is the retrieval of new information from memory—information that had previously been inaccessible to the rememberer (McCauley & Fisher, 1995; Odinot et al., 2009). Indeed, repeated interviewing usually results in the retrieval of new details (Bornstein, Liebel, & Scarberry, 1998; Brock, Fisher, & Cutler, 1999; Scrivner & Safer, 1988; Turtle & Yuille, 1994), a phenomenon known as *reminiscence* (Payne, 1987). In the present study, we examined not only whether eye-closure during the second free recall would help witnesses to remember more information overall, but also whether it would help them to retrieve *new* information that they had not reported during the first free recall attempt. Mnemonic techniques based on visual imagery, such as the method of loci and the pegword technique, have been found to facilitate accessibility to retrieval cues (e.g., Carlson, Kincaid, Lance, & Hodgson, 1976; Wang & Thomas, 2000). Based on these findings, we expected that the visual imagery processes associated with eye-closure would promote accessibility to internally generated retrieval cues, thereby facilitating the retrieval of new information.

Finally, we investigated whether eye-closure during the first free recall attempt affected free and cued recall performance a week later. Various studies have found that the benefits of a good-quality initial recall attempt can "carry over" to a second recall attempt (Gabbert, Hope, & Fisher, 2009; Marsh, Tversky, & Hutson, 2005; Tversky & Marsh, 2000). In contrast, however, such carry-over effects have not been observed for repeated Cognitive Interviews (Brock et al., 1999; McCauley & Fisher, 1995; Memon, Wark, Bull, & Köhnken, 1997). In light of these findings, we expected that eye-closure during the first session would not affect recall performance a week later.

Method

Participants

Fifty-five undergraduate students from a British university participated for course credit or a small monetary reward. Six participants who failed to show up for the second session and one participant who had seen the TV series used as stimuli in the current study on a prior occasion were removed from the analysis, leaving 18 male and 30 female participants (mean age = 21.00 years, *SD* = 3.30).

Materials

Participants watched a 2.5-min video clip from a commercial TV series, depicting a man who breaks into a woman's house and tries to cut her with a knife. The first author generated cued-recall questions about aspects of the video that addressed either visual or auditory details. The questions were asked in the order in which the corresponding information appeared in the video.

Design

Participants were randomly assigned to one of four combinations of instructed eye-closure at time 1 (T1) and time 2 (T2), namely: open-open, closed-open, open-closed, or closed-closed (N = 12 in each condition). The free recall data were analysed using a 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) x 2 (Time of Recall: T1, T2) mixed analysis of variance (ANOVA) with repeated measures on the last factor. The cued recall data were analysed using a 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) x 2 (Modality of Encoded Information: visual, auditory) mixed ANOVA.

Procedure

All participants were tested individually in a small laboratory. After giving informed consent, participants watched the video and engaged in a two-minute distracter task involving the backwards spelling of animal names (cf. Perfect et al., 2008). Upon finishing the task, all participants received the following instructions: “Please describe what happened in the video in as much detail as you can. Tell me everything you can remember, but do not guess about anything you are unsure of. I will not interrupt you during your description.” In addition, 24 participants were instructed as follows: “Please keep your eyes closed throughout your report, until I tell you that you can open them again”. If participants opened their eyes at any point during the free report, they were reminded to keep their eyes closed. The remaining 24 participants received no eye-closure instruction. None of the participants in the eyes-open condition spontaneously closed their eyes; all of them looked at the interviewer throughout the interview. At the end of the session, participants were asked to return one week later.

At the start of the second session, participants were given the same free-recall instructions as in the first session. Half of the participants who had closed their eyes in the first session were asked to close their eyes again during both free and cued recall in the second session (closed-closed), whereas the remaining half received no eye-closure instruction (closed-open). If participants in the latter group asked whether they needed to close their eyes again, they were asked to keep them open. In a similar vein, half of the participants who did *not* close their eyes in the first session were instructed to close their eyes in the second session (open-closed), whereas the other half were not (open-open). Upon completing their free report, all participants were told: "I am now going to ask you some questions about the video. Please try to answer the questions in as much detail as possible, but do not guess if you're not certain about the answer (simply tell me you don't know)." If necessary, participants in the eyes-closed condition were reminded to close their eyes. The interviewer then asked 16 questions about the video (see Appendix). At the end of the second session, participants were asked whether they had seen the TV series before. Finally, they were debriefed and thanked for their participation.

Data Coding

Free recall. All audio-taped interviews were transcribed and coded blind to interview condition. Prior to the experiment, a list of potential details (i.e., unique items of information) about the video clip was constructed, to which additional details mentioned by participants were added progressively. For instance, the statement "the woman had brown hair and was wearing a nightgown" was broken up into three details: (1) the woman, (2) brown hair, and (3) wearing a nightgown. First, all details provided during free recall were coded as correct, incorrect, or subjective. Because the accuracy of subjective details could not be determined (e.g., “he was ugly”), these details were excluded from further coding. Next, the correct and incorrect details were coded as visual (e.g., “he had curly hair”) or auditory (e.g., “his name was Billy”). In total, the coding scheme included 127 correct and 19 incorrect details, of which 102 were visual and 44 auditory in nature. Of the incorrect details, 15 were inaccurate (e.g., saying that the woman called the police rather than an ambulance) and 4 were confabulations (mentioning a detail or event that did not happen, e.g., “he was crying”). Because participants provided so few confabulated details, inaccurate and confabulated items were collapsed into a single measure of incorrect recall prior to analysis.

The initial and delayed witness reports of ten randomly selected participants were coded independently by a second blind coder. Inter-rater reliability was perfect for accuracy of details (correct or incorrect), $\kappa = 1.00$, $p < .001$, and very high for modality of details (visual or auditory), $\kappa = .98$, $p < .001$.

Cued recall. Responses provided in cued recall were coded as correct, incorrect, or omitted, and all correct responses were scored as coarse-grain (e.g., “the shirt was grey” or “he said it was for a female”) or fine-grain (e.g., “the shirt had a grey body with dark blue sleeves” or “he said it was for his sister”). Responses were coded as incorrect if they contained at least one inaccurate element. Due to insufficient data, incorrect responses were not analysed for grain size. Ten interviews were randomly selected and coded independently by another blind coder. Inter-rater reliability (for the decision to code a response as fine-grain correct, coarse-grain correct, incorrect, or omitted) was high, $\kappa = .92$, $p < .001$. The codes of the first author were retained for the main analysis.

Results

Prior to analysis, outliers with a Z-score exceeding 2.58 were replaced with the mean plus or minus two standard deviations (cf. Field, 2004). In addition, three variables were square-root transformed to reduce skewness. After these corrections, all variables met the assumptions for parametric tests. The corrections did not affect the pattern or significance of the findings. For the subsidiary analyses reported below (i.e., modality and grain size), we report only results relevant to the eye-closure manipulation.

Free Recall

Number of correct items reported. Free recall performance at time 1 (T1) and time 2 (T2) is shown in Table 1. A 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) x 2 (Time of Recall: T1, T2) mixed ANOVA on the total number of correct details revealed that participants reported significantly more details at T1 ($M = 30.33$, $SD = 10.23$) than at T2 ($M = 25.00$, $SD = 9.53$), F (1, 44) = 61.72, $p < .001$, $\eta^2 = .58$. There was no significant main effect of condition at T1 ($F < 1$) and no interaction between condition at T1 and time of recall ($F < 1$), suggesting that eye-closure during the first session had no effect on the number of correct details reported at T1 or T2. There was no significant main effect of condition at T2, F (1, 44) = 3.21, $p = .08$, $\eta^2 = .07$, but there was a significant interaction between condition at T2 and time of recall, F (1, 44) = 6.65, $p = .01$, $\eta^2 = .06$. Participants who closed their eyes at T2 reported significantly more correct details at T2 than participants who kept their eyes open, F (1, 44) = 6.39, $p = .02$, $\eta^2 = .13$. There was no significant interaction between condition at T1 and T2 ($F < 1$), and no significant three-way interaction ($F < 1$). In short, eye-closure during the first session did not affect free recall performance during the first or the second session, but eye-closure during the second session significantly increased the number of correct details reported during that session.

[TABLE 1 ABOUT HERE]

Because the modality of reported details was not under experimental control, separate three-way ANOVAs were conducted for visual and auditory correct details, respectively. For visual details, the main effect of condition at T2 did not reach significance, F (1, 44) = 3.72, p = .06, η^2 = .08, but there was a significant interaction between condition at T2 and time of recall, F (1, 44) = 9.08, p = .004, η^2 = .13. Participants who closed their eyes at T2 remembered 36.7% more correct visual details at T2 (M = 21.13, SD = 7.47) than participants who kept their eyes open (M = 15.46, SD = 6.19), F (1, 44) = 7.95, p = .007, η^2 = .15. There were no other significant effects (all Fs < 1; all ps > .50). Another three-way ANOVA on the number of correct auditory details revealed no significant effects involving eye-closure (all Fs < 1.15; all ps > .29).

Number of incorrect items reported. A 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) x 2 (Time of Recall: T1, T2) mixed ANOVA on the total number of incorrect details revealed no significant effects of time of recall, F (1, 44) = 2.95, p = .09, η^2 = .06, condition at T1 (F < 1), or condition at T2, F (1, 44) = 1.71, p = .20, η^2 = .04, and no significant interactions (all Fs < 1.31; all ps > .25).

A three-way ANOVA on the number of incorrect visual details showed no significant effect of condition at T1 (F < 1), but a significant main effect of condition at T2, F (1, 44) = 4.15, p = .048, η^2 = .08, and a significant interaction between condition at T1 and condition at T2, F (1, 44) = 5.18, p = .03, η^2 = .10. Simple effects analyses showed that, for participants who had closed their eyes at T1, eye-closure at T2 did not significantly affect incorrect recall of visual details (F < 1). For participants who had *not* closed their eyes at T1, however, eye-closure during T2 significantly increased incorrect recall of visual details (see Table 1), F (1, 44) = 9.29, p = .004, η^2 = .17. Another three-way ANOVA on the transformed number of incorrect auditory details revealed no significant effects of condition at T1, F (1, 44) = 2.92, p

= .10, η^2 = .06, or condition at T2 (F < 1), and no significant interactions (all Fs < 1.89; all ps > .17).

Accuracy rate. We calculated the accuracy rate by dividing the number of correct details by the total number of details reported. A three-way ANOVA on accuracy rate revealed only a significant main effect of time of recall, F (1, 44) = 9.44, p = .004, η^2 = .18, indicating that accuracy rate was significantly higher at T1 (M = .95, SD = .04) than at T2 (M = .93, SD = .03). There were no other significant effects (all Fs < 1; all ps > .46).

A three-way ANOVA on the transformed accuracy rate for visual details revealed no significant effects of condition at T1, F (1, 44) = 1.58, p = .22, η^2 = .03, or condition at T2, F (1, 44) = 1.01, p = .32, η^2 = .02. The interaction between condition at T1 and condition at T2 did not reach significance, F (1, 44) = 3.84, p = .06, η^2 = .08. None of the other interactions were significant (all Fs < 2.01; all ps > .16). A three-way ANOVA on the transformed accuracy rate for auditory details revealed no significant effects of condition at T1, F (1, 44) = 2.97, p = .09, η^2 = .06, or condition at T2 (F < 1), and no significant interactions (all Fs < 1.40; all ps > .24).

Number of reminiscent items. To investigate whether eye-closure during free recall at T2 helped participants to retrieve *new*, previously unreported information (i.e., reminiscence), a 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) ANOVA was conducted on the number of correct new details reported during the second free recall. Participants who closed their eyes at T2 reported significantly more correct new details than participants who kept their eyes open, F (1, 44) = 5.43, p = .02, η^2 = .10. There was no significant effect of condition at T1, F (1, 44) = 2.63, p = .11, η^2 = .05, and no significant interaction between condition at T1 and T2 (F < 1).

Two separate ANOVAs for visual and auditory new details, respectively, showed that eye-closure at T2 substantially increased the number of correct new visual details recalled at

T2, from 2.54 on average (*SD* = 2.38) in the eyes-open condition to 4.83 (*SD* = 2.81) in the eyes-closed condition, F (1, 44) = 9.56, p = .003, η^2 = .17. However, eye-closure at T2 had no significant effect on the number of correct new auditory details reported, F (1, 44) = 2.23, p = .14, η^2 = .05 (eyes-open condition: *M* = 1.04, *SD* = 1.08; eyes-closed condition: *M* = .67, *SD* = .56).

Another two-way ANOVA on the number of *incorrect* new details reported revealed no significant effects (all *F*s < 1; all *p*s > .34). Separate two-way ANOVAs on the number of visual and auditory incorrect new details, respectively, revealed no significant effects either (all *F*s < 2.77; all *p*s > .10).

Cued Recall

Number of correct responses. Table 2 shows cued recall performance. A 2 (Condition T1: eyes open, eyes closed) x 2 (Condition T2: eyes open, eyes closed) x 2 (Modality of Encoded Information: visual, auditory) mixed ANOVA on the total number of correct responses revealed that participants gave significantly more correct responses about visual details (*M* = 5.15, *SD* = 1.83) than about auditory details (*M* = 3.29, *SD* = 1.18), F (1, 44) = 41.91, p < .001, η^2 = .43. Eye-closure at T1 did not have a significant effect on cued recall performance a week later, F (1, 44) = 2.62, p = .11, η^2 = .05. Participants who closed their eyes during the second session, however, answered significantly more questions correctly (*M* = 9.21, *SD* = 1.93) than participants who kept their eyes open (*M* = 7.67, *SD* = 2.20), F (1, 44) = 6.77, p = .01, η^2 = .13. This main effect was qualified by a significant interaction between eye-closure during questioning and question modality, F (1, 44) = 7.24, p = .01, η^2 = .07. Simple effects analyses showed that eye-closure at T2 increased correct recall of visual details by 35.3% (from 4.38 to 5.92), F (1, 44) = 10.06, p = .003, η^2 = .19, but did not affect correct recall of auditory details ($F < 1$). There were no other significant interactions (all Fs < 2.80; all ps > .10).

[TABLE 2 ABOUT HERE]

A three-way ANOVA on the number of fine-grain correct responses revealed no significant effect of eye-closure at T1, F (1, 44) = 2.22, $p = .14$, $\eta^2 = .04$, but participants who closed their eyes at T2 gave significantly more fine-grain correct responses ($M = 5.96$, $SD = 2.20$) than participants who kept their eyes open ($M = 3.88$, $SD = 1.65$), F (1, 44) = 13.88, $p < .001$, $\eta^2 = .22$. The interaction between eye-closure at T2 and modality of encoded information did not reach significance, F (1, 44) = 3.73, $p = .06$, $\eta^2 = .06$, but the data suggest that eye-closure during questioning was somewhat more effective for fine-grain correct recall of visual information than for fine-grain correct recall of auditory information (see Table 2). There were no other significant interactions (all Fs < 1.09; all ps > .30). Another three-way ANOVA on coarse-grain correct recall revealed no significant effects involving eye-closure (all Fs < 1.44; all ps > .23).

Number of incorrect responses. A three-way ANOVA on the number of incorrect responses revealed no significant effects of modality of encoded information ($F < 1$) or interview condition at T1 ($F < 1$; see Table 2). However, participants who closed their eyes during questioning provided significantly fewer incorrect responses ($M = 2.83$, $SD = 1.37$) than participants who kept their eyes open ($M = 3.71$, $SD = 1.55$), F (1, 44) = 4.12, $p = .048$, $\eta^2 = .09$. This main effect was qualified by a significant interaction between condition at T2 and modality, F (1, 44) = 4.13, $p = .048$, $\eta^2 = .08$. Eye-closure at T2 reduced incorrect responses about visual details by 42.3% (from 2.17 to 1.25), F (1, 44) = 7.52, $p = .009$, $\eta^2 = .15$, whereas it did not significantly affect incorrect responses about auditory details ($F < 1$). There were no other significant interactions (all Fs < 1.32; all ps > .25).

Accuracy rate. The accuracy rate was obtained by dividing the total number of correct responses by the total number of correct plus incorrect responses. A three-way ANOVA on accuracy rate revealed no main effects of modality of encoded information, F (1, 44) = 1.78, p = .19, η^2 = .03, or eye-closure at T1, F (1, 44) = 1.07, p = .31, η^2 = .02. There was a significant main effect of eye-closure at T2, F (1, 44) = 6.37, p = .02, η^2 = .12, which was qualified by a significant interaction between eye-closure during questioning and modality, F (1, 44) = 4.60, p = .04, η^2 = .09. For questions about visual details, participants who closed their eyes at T2 were significantly more accurate (M = .83, SD = .16) than participants who kept their eyes open (M = .65, SD = .20), F (1, 44) = 11.39, p = .002, η^2 = .21. For questions about auditory details, eye-closure had no significant effect on accuracy rate ($F < 1$). There were no other significant interactions (all Fs < 1.74; all ps > .19).

Discussion

We investigated the effectiveness of the eye-closure instruction in a repeated-interviewing paradigm. Eye-closure was effective during the second session but not during the first, providing more support for the idea that the intervening delay made retrieval more difficult than for the idea that the first recall attempt "locked" the memory in place. As predicted, eye-closure during the first free recall did not have any "carry-over" effects on recall performance a week later. Finally, as hypothesized, eye-closure was most effective for recall of visual information, and also facilitated the retrieval of new, previously unreported visual information (i.e., reminiscence). Each of these findings will be discussed in more detail below.

In line with previous findings reported for the Cognitive Interview (Larsson et al., 2003), we found that eye-closure was more effective during the second free recall than during the first. Unlike Burke and colleagues (1992), we did not find that the initial free recall attempt “locked” the memory in place; both the amount and the accuracy of reported information decreased from the first to the second session. We suspect that the format of the initial recall task determines whether the memory is “locked” in place (e.g., Burke et al. used a recognition test rather than a free-recall task), which could be investigated in future research. In light of participants’ decreased recall performance after the intervening one-week delay (cf. Lipton, 1977), it is perhaps not surprising that eye-closure was particularly effective during the second session. Nevertheless, we did not anticipate a null effect of eye-closure during the first free recall attempt. This finding is at odds with Perfect and colleagues’ (2008) findings that eye-closure improved recall of events witnessed a few minutes earlier. However, the benefits of eye-closure after a short delay have not always been replicated (Wagstaff, Wheatcroft, Burt, et al., 2011). The inconsistency of the eye-closure effect after short delays warrants further investigation.

As predicted, eye-closure during the first session did not significantly affect free or cued recall performance during the second session, mirroring previous findings with repeated Cognitive Interviews (e.g., Brock et al., 1999). However, because the eye-closure manipulation did not improve the quantity or quality of the information recalled during the first session, it did not constitute a “good-quality” initial recall opportunity as advocated by Gabbert and colleagues (2009). In other words, the benefits of eye-closure during the first free recall could not have “carried over” to subsequent recall, because there were no benefits in the first place. Hence, further research is required to investigate whether the benefits of eye-closure during initial recall can carry over to subsequent recall performance.

Eye-closure during the second session increased the number of correct visual details in free recall by 36.7% and the number of correct responses about visual details in cued recall by 35.5%. In cued recall, eye-closure improved the retrieval of fine-grain visual information (e.g., “she elbowed him in the face”) but not coarse-grain visual information (e.g., “she hit him"), consistent with Vredeveldt and colleagues' (2011) previous findings. In contrast, eye-closure had no significant effect on retrieval of auditory details. These findings provide support for the idea that visualization plays an important role in the eye-closure effect (see also Caruso & Gino, 2011; Wais et al., 2010).

For participants who had not closed their eyes during the first session, eye-closure during the second free recall also significantly increased the report of *incorrect* visual information, which could have problematic consequences in legal settings. Nevertheless, the increase in the amount of visual information reported as a result of eye-closure was not accompanied by a loss in the accuracy of visual information reported. Similar increases in quantity without a loss in quality have been observed for the Cognitive Interview (see Köhnken, Milne, Memon, & Bull, 1999; Memon, Meissner, & Fraser, 2010). Moreover, eye-closure during questioning actually *improved* the accuracy of visual information obtained during cued recall. In short, in free recall, eye-closure during the second session increased the quantity of visual information without harming its quality, and in cued recall, eye-closure increased both quantity and quality.

Interpretation of the present findings was limited by the fact that recall performance overall was higher for visual than for auditory details, which could be due to many factors (e.g., the amount of visual and auditory information in the video, or the salience of visual and auditory information, respectively). In light of this difference, an alternative explanation could be that eye-closure improves recall of easy-to-remember, as opposed to difficult-to-remember, information. However, if eye-closure were more effective for "easier" forms of recall, we would have expected it to have a bigger impact on immediate free recall than on delayed free recall, whereas we observed the opposite. Moreover, in previous experiments in which cued recall performance was better for auditory than for visual details, eye-closure was still only effective for recall of visual details (Perfect et al., 2008, Experiment 2; Vredeveldt

& Penrod, 2012). Thus, an explanation of the eye-closure effect based purely on information difficulty does not seem to account well for the findings. Nevertheless, follow-up research could investigate whether eye-closure improves recall of auditory information when no visual information is presented (i.e., earwitness testimony; Campos & Alonso-Quecuty, 2006; 2008; Pezdek & Prull, 1993), to rule out the possibility that closing the eyes implicitly accentuates the importance of the visual information.

A limitation of the present study was that our sample size was relatively modest, which may have accounted for some of the marginally significant effects. Perhaps even more importantly, the effects of delay and repeated recall attempts were confounded in the current study. To examine the individual contributions of delay and repeated recall, respectively, future research should disentangle these effects. Nevertheless, from an applied point of view, the finding that eye-closure was, if anything, *more* effective after a week and a previous recall attempt is promising.

Practical Implications

Although various countries have already implemented effective interview procedures, such as the Cognitive Interview (which also includes a recommendation for eye-closure), many of these procedures are complex and time-consuming (Clarke & Milne, 2001; Dando, Wilcock, & Milne, 2009a; Kebbell, Milne, & Wagstaff, 1999). Therefore, the simple eye-closure instruction could be a useful addition to the investigative interviewer's tool box, particularly in cases in which time is limited. This interview tool could be used alongside other brief techniques shown to be effective, such as focused meditation, mental context reinstatement, and modified Cognitive Interview procedures (e.g., Dando, Wilcock, & Milne, 2009b; Davis, McMahon, & Greenwood, 2005; Wagstaff et al., 2004; 2007; 2011a; 2011b).

Perhaps the most important finding from a practical point of view was that eye-closure facilitated one of the main goals of repeated interviewing, namely, reminiscence. Witnesses who closed their eyes during the second session provided nearly twice as many previously unreported correct visual details than witnesses who kept their eyes open. Thus, it seems that the visual imagery processes associated with eye-closure may have increased accessibility to retrieval cues (see e.g., Wang & Thomas, 2000). In conclusion, the present findings suggest that eye-closure during the interview can help witnesses to retrieve new visual information from memory. This new information could provide valuable new leads for police investigations.

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Table 1. Means (*M*) and standard deviations (*SD*) for the number of correct and incorrect details reported in free recall at time 1 and 2, by modality of details and interview condition (referring to eye-closure at time 1 and time 2, respectively; *N* = 12 per condition).

	Interview Condition							
	open-open		closed-open		open-closed		closed-closed	
TIME 1	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Visual								
Number correct	19.00	8.37	20.00	7.94	22.42	6.95	21.08	7.73
Number incorrect	0.67	0.78	1.25	1.29	0.83	0.58	1.17	0.94
Accuracy rate	0.96	0.06	0.93	0.08	0.96	0.03	0.95	0.04
Auditory								
Number correct	8.83	3.54	9.67	4.58	10.33	3.80	10.00	2.73
Number incorrect	0.92	1.00	0.33	0.49	1.08	1.31	0.42	0.67
Accuracy rate	0.90	0.10	0.96	0.06	0.90	0.11	0.96	0.06
Total								
Number correct	27.83	10.11	29.67	11.08	32.75	10.57	31.08	9.83
Number incorrect	1.58	1.24	1.58	1.24	1.92	1.24	1.58	1.31
Accuracy rate	0.95	0.05	0.95	0.04	0.95	0.04	0.96	0.03
TIME 2								
Visual								
Number correct	14.92	6.29	16.00	6.31	22.17	6.31	20.08	8.64
Number incorrect	0.67	0.89	1.17	0.58	2.00	1.04	1.17	0.83
Accuracy rate	0.96	0.05	0.92	0.05	0.92	0.04	0.93	0.06
Auditory								
Number correct	5.92	1.88	6.50	3.29	7.58	3.26	6.83	2.62
Number incorrect	1.08	1.00	0.67	0.78	0.67	0.78	0.75	0.62
Accuracy rate	0.85	0.12	0.93	0.08	0.92	0.10	0.90	0.09
Total								
Number correct	20.83	7.26	22.50	8.91	29.75	9.03	26.92	10.97
Number incorrect	1.75	1.22	1.83	0.83	2.67	1.37	1.92	0.67
Accuracy rate	0.94	0.04	0.94	0.03	0.93	0.04	0.94	0.03

Table 2. Means (*M*) and standard deviations (*SD*) for the number of fine-grain correct, coarse-grain correct, incorrect, and "don't know" responses and accuracy rate provided in cued recall at time 2, by modality of encoded information and interview condition (*N* = 12 per condition).

	Interview Condition							
	open-open		closed-open		open-closed		closed-closed	
Visual	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Fine-grain correct	2.08	*1.31*	2.17	*1.27*	4.00	*1.76*	3.42	*2.31*
Coarse-grain correct	2.00	*1.04*	2.50	*1.51*	2.25	*1.36*	2.17	*1.19*
Incorrect	2.33	*1.07*	2.00	*1.21*	1.17	*1.11*	1.33	*1.23*
"Don't know"	1.58	*1.73*	1.33	*1.67*	0.58	*0.67*	1.08	*0.90*
Accuracy rate	0.62	*0.18*	0.67	*0.22*	0.85	*0.14*	0.80	*0.18*
Auditory								
Fine-grain correct	2.17	*0.72*	1.33	*0.98*	2.42	*0.79*	2.08	*1.08*
Coarse-grain correct	1.75	*0.97*	1.33	*1.07*	1.17	*1.03*	0.92	*0.79*
Incorrect	1.42	*0.79*	1.67	*0.98*	1.75	*1.14*	1.42	*1.24*
"Don't know"	2.67	*1.07*	3.67	*0.89*	2.67	*1.56*	3.58	*1.08*
Accuracy rate	0.75	*0.12*	0.61	*0.21*	0.69	*0.16*	0.67	*0.26*
Total								
Fine-grain correct	4.25	*1.54*	3.50	*1.73*	6.42	*1.68*	5.50	*2.61*
Coarse-grain correct	3.75	*1.22*	3.83	*1.95*	3.42	*1.56*	3.08	*1.44*
Incorrect	3.75	*1.29*	3.67	*1.83*	2.92	*1.51*	2.75	*1.29*
"Don't know"	4.25	*1.96*	5.00	*1.91*	3.25	*1.71*	4.67	*1.67*
Accuracy rate	0.68	*0.10*	0.66	*0.17*	0.78	*0.10*	0.75	*0.12*