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ORIGINAL ARTICLE

How Can We Help Witnesses to Remember More? It's an (Eyes) Open and Shut Case

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Abstract Five experiments tested the idea that instructing a witness to close their eyes during retrieval might increase retrieval success. In Experiment 1 participants watched a video, before a cued-recall test for which they were either instructed to close their eyes, or received no-instructions. Eye-closure led to an increase in correct cued-recall, with no increase in incorrect responses. Experiments 2–5 sought to test the generality of this effect over variations in study material (video or live interaction), test format (cued- or free-recall) and information modality (visual or auditory details recalled). Overall, eye-closure increased recall of both visual detail and auditory details, with no accompanying increase in recall of false details. Collectively, these data convincingly demonstrate the benefits of eye-closure as an aid to retrieval, and offer insight into why hypnosis, which usually involves eye-closure, may facilitate eyewitness recall.

Keywords Eyewitness memory · Eye-closure

A witness to a crime plays an important role in the forensic process, influencing not only juror deliberations, but also the direction of the entire investigative process. Police interviewers are trained to try to maximise the amount of information that a willing witness can give them, so that they can generate leads to follow, confirm or disconfirm alibis, and so forth. One of the most positive contributions that psychologists have made to the forensic process has been the development of the cognitive interview (Geiselman et al. 1985, 1986), later the revised cognitive interview (Fisher and Geiselman 1992), which has been enthusiastically adopted by many police forces around the world.

The revised cognitive interview combines cognitive principles known to improve recall, such as mental context reinstatement and multiple retrieval attempts, together with principles from social psychology, such as conversation management skills, and rapport-building between the interviewer and interviewee. The general consensus is that this package has proven successful in increasing the number of details recalled by a witness, with less impact upon the number of incorrect details reported (Clifford and George 1996; Geiselman et al. 1985, 1986; Kebbell and Wagstaff 1999; Kohnken et al. 1999). In the most recent meta-analysis of the cognitive interview, Kohnken et al (1999) reported an average effect size on correct recall of $d = .87$, with an associated increase in incorrect recall of $d = .28$.

However, a problem associated with the cognitive interview as a method for eliciting additional information is that it is a complex procedure, requiring substantial training to learn, and a long time to conduct. Because of this complexity, not all officers receive this training, and even trained officers deviate from the procedures specified in the cognitive interview training (Kebbell and Wagstaff 1999; Kebbell et al. 1999).

One possible alternative to the cognitive interview is hypnosis. Indeed, hypnotic investigative interviewing was a precursor to the cognitive interview, and the procedures used share a number of common elements (Wagstaff 1999). However, whilst the evidence suggests that, for recall of

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meaningful stimuli, hypnotic interview procedures may sometimes produce more correct information than no memory facilitation procedures at all (Erdelyi 1994; Geiselman et al. 1985; Hibbard and Worring 1981; Wagstaff 1999), the present consensus is that, overall accuracy, as determined by the proportion of correct to incorrect responses, is not generally improved with hypnosis; in fact, sometimes it may deteriorate (see, for example, Dinges et al 1992; Dywan and Bowers 1983; Erdelyi 1994; Wagstaff 1982, 1984, 1999). Hypnosis may also encourage witnesses to incorporate more misleading information into their reports, and give rise to a 'false confidence' effect, whereby they are more confident in their reports generally, including reports of incorrect information (Scoboria et al. 2002; McConkey and Sheehan 1996). There are other practical difficulties; although hypnotic interviews can be shorter and simpler than the cognitive interview (Geiselman et al. 1985), the procedures still must be learned, police officers may not follow hypnotic guidelines appropriately, and not all witnesses are hypnotically susceptible, even if they are willing to be hypnotised.

The ideal procedure for the police to use during interviews would be a simple intervention that requires no special training for the interviewer, can be applied to the entire population of potential witnesses, and that has an effect on correct memory reports, with no corresponding increase in false details reported. The present studies examine just such an intervention, namely eye-closure. The point of departure for the present work was a study by Wagstaff et al. (2004). Experiment 2 of their paper investigated the effects of two techniques derived from hypnotic interviewing, meditation and eye-closure, on the free recall of a distant public event (the funeral of Lady Diana). Both meditation and eye-closure independently increased the number of correct details reported, with no interactive effect, and with no increase in number of incorrect details reported.

Interestingly, eye-closure also features in the instructions for the cognitive interview. In their handbook, Fisher and Geiselman (1992) gave the following advice:

> To probe mental images most effectively, competing sensory signals should be minimized. The interview room should be set up with as few distracting sights and sounds as possible. To block out the remaining signals, the eyewitness should be encouraged to close her eyes and concentrate on her mental image. The interviewer might suggest 'This is a very difficult task and will require a lot of concentration. You'll probably find it easier to concentrate if you close your eyes.'
>
> To clarify these instructions, and to lower the eyewitness's resistance to closing her eyes, the interviewer can set an example by closing his eyes. Some eyewitnesses will be reluctant to close their eyes, especially if proper rapport has not yet been established by the interviewer (pp. 133–134, original italics retained).

This advice in favour of eye-closure is given without reference to supporting studies. Moreover, to the present authors' knowledge, this aspect of the cognitive interview has never been formally tested, other than in the Wagstaff et al. (2004) study. This seems anomalous, since other aspects of the cognitive interview, such as context reinstatement, change of perspective, reverse order and instruction to report everything have all been subject to individual analysis, with mixed success (Milne and Bull 2002).

Although the Wagstaff et al. (2004) data are suggestive, they are not ideal as a demonstration of the efficacy of eye-closure for an eyewitness setting. The event tested was highly famous, and featured in a range of media for an extended period. The subject was one which gripped the nation for some considerable time, with discussion both in the media, and between individuals. If eye-closure is only efficacious for such important and widely known stimuli, it may not be a useful technique for more mundane events about which the police may interview witnesses. Consequently, our first study explored the effects of eye-closure on the ability of witnesses to provide answers to interview questions for an event that they had witnessed only once, and that they had not discussed with anyone else.

Experiment 1

Method

Participants

Fifty undergraduate volunteers (25 male) were recruited to take in the study, either for course credit, or on a voluntary basis. No demographic data were collected.

Procedure

Participants were tested individually in a small laboratory in the School of Psychology at the University of Plymouth. They were initially told that they would see a short video clip depicting a simulated crime. After giving their informed consent to participate, participants watched the video clip, before being taken to a separate room nearby for an interview. For the interview, participants were randomly allocated to one of two conditions, instructed eye-closure, or no instruction control. Participants in the eyes closed

condition were asked to keep their eyes closed for the duration of the interview, and were reminded by the experimenter as appropriate. Those in the control condition were given no specific instructions, and no attempt was made to monitor whether or not they closed their eyes during the interview.

In each condition, participants were asked a series of 15 questions, designed to target specific verifiable details in the video such as "*What time did the clock on the wall of the office read*?" and "*How many men were standing by the lorry*?" Participants were told to give their best answer, but not to guess: a "don't know" response was permissible. Prior to the interviews, 2 experimenters agreed upon what constituted a correct answer to each question (e.g. *1.45 pm*), and participants responses were coded as being correct if they provided exactly this answer, otherwise they were coded as being incorrect or an omission as appropriate. Additional details reported by witnesses were not coded. Participants were given as long as they wished to give an answer orally, or say that they didn't know. Once they had responded, the experimenter read the next question. Responses were audio-taped for subsequent analysis.

Results and discussion

The primary interest was in whether instructed eye-closure increases the amount witnesses could successfully recall. This was analysed by comparing the number of correct responses given by each witness to the 15 questions, and the results are shown in the top row of Table 1. Overall, there was a reliable effect of instructed eye-closure, $t(48) = 5.88$, $p < .001$, $d = 1.66$.

One possible interpretation of this effect is that eye-closure simply increased willingness to provide any answer, which whilst increasing correct responses would also increase wrong answers. However, the evidence was against a response bias account. Those in the eye-closure condition reported fewer erroneous responses to the questions $t(48) = 2.93$, $p < .01$, $d = -1.02$. Thus, there was no evidence that eye-closure had its impact by increasing willingness to respond. The combination of increases in hit rate and decreases in errors meant that eye-closure led to more accurate reports than control (eye-closure: 71.4%, $SD = 11.4\%$ of reported details correct, control: 55.3% $SD = 14.1$ % of reported details correct, $d = 1.28$).

In addition, we recorded the duration of the interview, from the moment the interviewer began questioning, to the end of the last answer given by the witness. Here, there was evidence that interviews with participants with their eyes closed took reliably longer (108s, $SD = 31.8$s) than the control condition (89s, $SD = 12.7$s), $t(48) = 2.66$, $p < .05$, $d = .77$. Of course, it is hard to establish the nature of this effect: it may be that witnesses with their eyes closed had more to say, because they were accessing more memory details, or it may reflect behaviour on the part of the interviewer dealing with a witness with their eyes closed. We return to this issue in Experiments 3 and 5 when we report duration for free report, uncontaminated by the interviewer's interruptions.

Experiments 2–5

Experiment 1 replicated the previous finding, reported by Wagstaff et al. (2004), that instructing participants to close their eyes significantly increased the number of details that participants were able to recall. It did so for an event witnessed only once, and not discussed further, unlike the original demonstration. It also did so, with no increase in incorrect details recalled, and so it seems that eye-closure may be a very promising direction to explore with regards interviewing witnesses to crime. However, we do not yet know the generality of this effect. Consequently, the following series of studies sought to replicate this effect across three manipulations, the nature of the material to be recalled (visual or auditory details of the event), the nature of the test format (cued or free recall), and the nature of the event witnessed (a video clip encoded deliberately or an incidental live interaction with a stooge). The design of Experiment 2 replicated the main features of Experiment 1 (cued recall of a video event), but examined recall of visual and auditory material separately. Experiment 3 used a video clip, but used a free-recall paradigm which was then scored separately for visual and auditory details. Experiments 4 and 5 replicated these two studies, but with a live-interaction as the to-be-remembered event. Across the 5 studies, the test materials were always different (i.e. the videos differed in Experiments 1–3 and the stooges differed in Experiments 4 and 5). Thus, across the 5 studies, the patterns observed should be informative as to the generality of the eye-closure effect. Whilst each study differed in terms of the materials, the fundamental question remained the same: what is the impact of instructed eye-closure on recall of correct and incorrect details, for visual and auditory information. Because of the fundamental similarity between these studies, we will reserve discussion of the observed effects to the General Discussion.

Experiment 2

Method

Participants

Thirty two undergraduate volunteers from the University of Plymouth participated for course credit, or on a voluntary

Table 1 Mean recall of correct and incorrect visual and auditory details in Experiments 1–5 for no-instruction (open) and instructed eye-closure (closed) conditions

	Status of response							
	Correct				Incorrect			
	Visual		Auditory		Visual		Auditory	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Experiment 1								
Open	6.1	1.5			5.3	2.5		
Closed	8.8	1.7			3.6	1.6		
Effect size	*1.66*				*–1.02*			
Experiment 2								
Open	4.0	2.3	6.0	1.3	1.1	.8	.8	.9
Closed	5.1	1.7	5.1	1.7	1.3	1.2	1.0	1.2
Effect size	*1.59*		*–1.78*		*.19*		*.19*	
Experiment 3								
Open	5.7	3.4	5.2	2.2	1.3	1.3	.7	.7
Closed	10.9	5.0	8.1	2.9	.7	1.0	1.3	.8
Effect size	*1.27*		*1.14*		*–.49*		*.90*	
Experiment 4								
Open	3.3	1.4	4.5	1.7	2.1	1.5	1.5	.6
Closed	4.4	1.7	5.9	1.3	1.1	.7	.5	1.3
Effect size	*.71*		*.98*		*–.88*		*–1.16*	
Experiment 5								
Open	5.0	1.9	4.6	2.5	.25	.44	.18	.39
Closed	5.7	2.1	5.8	2.2	.21	.33	.12	.33
Effect size	*.39*		*.55*		*–.11*		*–.17*	

Notes: Auditory materials were not used in Experiment 1. The effect size measure reported is Cohen's d. The italics are used to distinguish the effect sizes from the means in the table, which appear in the same columns

basis. All had normal or corrected to normal vision and hearing. No further information was collected about the participants.

Materials

An 8 min video clip from a local news bulletin from a different region of the UK served as the stimulus materials. The experimenters initially generated questions designed to tap uniquely visual or auditory aspects of the video that were verifiably correct as before. Ten pilot participants then watched the video, and attempted to give answers to the original set of questions. On the basis of their performance, 9 audio and 9 visual questions were selected for inclusion in the full experiment. None of the participants in the pilot study took part in the experiment proper.

Procedure

Participants were tested individually in a small laboratory in the School of Psychology. After they had given their informed consent, participants watched the news clip on a television set, from a viewing distance of approximately 1.5 m. At the end of the clip, all participants engaged in a 2 min distracter task of backwards spelling of animal names provided by the experimenter. They were then randomly allocated to either an instructed eye-closure, or a no-instruction control condition.

Participants in the eye closure condition were asked to close their eyes throughout the interview process, and were reminded to keep their eyes closed if at any time they opened their eyes during this process. Participants in the control condition received no specific instructions about where they should look.

Participants then heard a series of 18 questions, and gave their responses orally. The experimenter recorded these as correct, incorrect, or no response, using a previously agreed set of answers, as in Experiment 1. The duration of the interview was not recorded. The order of the questions replicated the narrative order of events in the initial clip, and so the auditory and visual questions were mixed rather than blocked, in a fixed order throughout.

Results and Discussion

The analytic strategy in this study is the same as reported for Experiment 1. The first analysis looked at the number of correct details reported, using a 2 (condition: eyes open, eyes closed) × 2 (modality: auditory or visual details) mixed ANOVA. Overall, there was a main effect of modality, despite our attempts to match the two in our pilot work, $F(1,30) = 9.92$, MSE = 1.62, $p < .01$, $d = 1.11$. There was no overall effect of eye-closure, $F < 1$, but there was a reliable interaction between eye-closure and modality, $F(1,30) = 10.53$, MSE = 1.62, $p < .01$. This interaction was explored with two t-tests, neither of which reached significance. For the auditory material, eye-closure reduced rather than increased performance, $t(30) = -1.78$, $p < .09$, d = –.61 whilst for visual material, the pattern was in the opposite direction, $t(30) = 1.59$, $p < .13$, $d = .56$.

The next analysis examined the number of incorrect details that participants volunteered for visual and auditory questions, using a 2–way ANOVA as before. There was no effect of modality, $F(1,30) = 1.84$, MSE = .85, $p < .19$, $d = .5$, no effect of eye-closure, $F < 1$, and no interaction, $F < 1$. For both visual, and auditory materials, there was only a small effect of eye-closure ($d = .19$ in both cases). The net result of the interaction for hit rate, together with no effect on error rate meant that eye-closure was associated with more accurate responses for visual material (mean accuracy 57.5%, $SD = 18.5\%$ for eyes closed, and 44.4%, $SD = 25.7\%$ for eyes open, $d = .60$), but less accurate responses for auditory information (mean accuracy 56.3%, $SD = 18.3\%$ for eyes closed, and 66.6%, $SD = 14.6\%$ for eyes open, $d = -.64$).

The interactive effect of eye-closure is suggestive that the effects observed previously by Wagstaff et al. (2004), and in Experiment 1, may be restricted to visual materials, and may not be a general aid to memory for all kinds of details. This, in turn, might suggest that the benefits of eye-closure may have their effect through a mechanism that reduces visual interference effects, and thereby helps visual memory. What is less clear in such a view is why auditory memory performance is impaired by eye-closure. However, to date, this is only a single demonstration of an interactive effect, and there are various hypotheses that could be generated to account for the present pattern. Rather than dwell on these here, we will defer further discussion until after we have presented further relevant evidence.

Experiment 3

Experiments 1 and 2 used a cued-recall task, in which participants attempted to answers a set series of questions presented to them orally. However, in the standard interview situation, to which the cognitive interview is specifically designed to apply, witnesses initially begin with a free recall phase, and are only subsequently asked specific questions. Consequently, it is important to know whether the beneficial effects of eye-closure also apply to information freely volunteered by witnesses. Therefore, in Experiment 3, participants gave a free narrative account of the event they had witnessed. Our expectation was that eye-closure would result in more correct details, with no increase in incorrect details, although we were uncertain as to whether this would occur equally for both visual and auditory details.

Method

Participants

Thirty participants took part for course credit or on a voluntary basis. No other details about participants were collected.

Materials

A two-minute extract from a DVD of a little-known TV series (“The Family at War”, Series 1, Episode 11) was used as study material.

Procedure

All participants were tested individually either in a laboratory in the School of Psychology, or in their own homes. After giving their informed consent, participants were shown the DVD clip. Following this, participants were assigned to one of two conditions. Participants in the no-instruction condition were encouraged to treat the interview as if it were a police interview, and to concentrate throughout. They were instructed to recall everything they could, and to even report details that appeared trivial to them. Participants in the eye-closure condition received the same instructions, but with the additional instruction that they should keep their eyes closed throughout the free recall period. The free recall phase was recorded on a digital voice recorder for subsequent analysis. Each individual verifiable detail that was provided by the witness was then classified as being a visual or an auditory detail, and scored as being correct or incorrect by reference to the original DVD. Subjective details, such as estimates or statements of opinion, were also recorded, but they were few in number, and showed no effect of eye-closure, and so will not be discussed further.

Results and discussion

Our first analysis examined the number of objectively verifiable correct details that were provided in each free report, and the data are reported in Table 1. There was a main effect of main effect of modality, $F(1,28) = 5.22$, MSE = 7.45, $p < .05$, $d = .86$, indicating that witnesses reported more visual details than auditory ones. However, because this is spontaneous free report, it is impossible to know whether this reflects the difficulty of retrieval of the two kinds of information, or a reporting bias. There was also a benefit from eye-closure, $F(1,28) = 14.71$, MSE = 8.31, $p < .001$, $d = 1.45$ but no interaction between condition and modality, $F(1,28) = 2.46$, MSE = 8.31, $p < .13$. There were large benefits of eye-closure for both the visual ($d = 1.27$) and the auditory ($d = 1.14$) details.

The next analysis looked at the number of verifiably incorrect details that were reported. Here, there was no main effect of modality, $F < 1$, or eye-closure, $F < 1$. However there was a reliable interaction, $F(1,28) = 5.68$, $p < .05$, MSE = .95. For the auditory material, eye-closure reliably increased errors, $t(28) = 2.37$, $p < .05$, $d = .90$, whilst for visual material, eye-closure numerically reduced such errors, albeit non-significantly so, $t(28) = -1.29$, $p < .21$, $d = -.49$. The combination of a main effect of eye-closure on hits, together with an interactive effect of modality and eye-closure on errors meant that once again, eye-closure lead to more accurate reports for visual information (92.7%, *SD* = 10.1% of reported details were correct with eye-closure and 79.5%, *SD* = 23.5% in the control condition, $d = .76$). However, this advantage was not apparent for auditory information, where 85.0% SD 8.3% of reported auditory details were correct following eye-closure, but 90.7%, *SD* = 10.7% of auditory details were correct for control, $d = -.62$.

In summary, Experiment 3 showed that eye-closure benefits are also apparent for free-recall performance. Overall, there was a substantial increase in correct information following the instruction to close eyes during retrieval, which was not matched by a similar increase in incorrect details. Whilst recall of incorrect auditory details increased with eye-closure, recall of incorrect visual details decreased in frequency. Thus, there is no evidence that the increase in free recall of correct details following eye-closure instructions is due to a report criterion shift.

Because we recorded the free report phase, we were also able to analyse the duration that people spent describing the event they had witnessed, uncontaminated by any interviewer's questions. The data replicated the pattern seen in the previous study. Relative to control (67.0s, *SD* 27.7s), those in the eye-closure condition (122.9 SD 42.4) took reliably longer to make their free narrative report $t(28) = 3.84$, $p < .001$, $d = 1.45$. Whether this is the cause or the consequence of the increase correct recall is hard to determine definitively. However, it could be argued that if the participants in the eye-closure condition spent longer recalling simply because of they were more motivated to do so, or because of the lack of social cues for them to stop, one might have expected more incorrect details to accompany the increase in time. This did not happen. We return to this point in the General Discussion.

Experiment 3 was successful in demonstrating an overall benefit of eye-closure for free recall of both visual and auditory details. This was therefore in contrast to the interactive pattern observed in Experiment 2. Because there are numerous potential explanations for discrepancy, we reserve further discussion of this point until we have presented the next two studies that address this issue. The main aim of these studies was to test whether the benefits of eye-closure extend to live events that are experienced incidentally, rather than using video-based materials. Experiment 4 used a cued-recall test, and Experiment 5 used a free-recall test. Comparison of these two studies, together with Experiments 2 and 3 should give a clearer picture of the relative effects of eye-closure on recall of visual and auditory details.

Using a live event to test the generality of the eye-closure effect introduces problems with the scoring of recall. One is that because each witness is involved in the event, each event might be slightly different. Another problem is that we would not be able to revisit the event to verify the accuracy of report. Consequently, we developed a script-based approach for these studies. For each event (which differed across the two studies), standard scripts, clothing and props were developed, so that we could be certain of the occurrence of key auditory and visual details within the event. We then scored the cued-recall (Experiment 4) and free recall (Experiment 5) responses for only these details: participants may have reported other details, correctly or incorrectly, but these were not scored, or included in any analysis.

Experiment 4

Method

Participants

Thirty four undergraduate participants took part for course credit or on a voluntary basis. No other details about participants were collected.

Materials

A female stooge took the role of a participant volunteering for a study at the same time as the participant. Each event

was staged individually for each participant, and followed the same script, in the same location, with the stooge wearing the same clothing and carrying the same objects each time. The event lasted approximately 5 min, and consisted of a number of elements. Initially, the participant met the experimenter in a small test room, and was asked to wait for a second participant to arrive. One minute later the experimenter led the second participant (actually a female stooge) into the room. The experimenter then left to "set up the study". After 2 min, the stooge received a cell-phone call, and the ensuing scripted conversation established that the stooge had a prior commitment. Once the call was over, the stooge asked the participant to give her apologies to the experimenter and left. The experimenter arrived back at the room 1 min later.

Pilot work was used to develop 8 auditory and 8 visual questions about the scripted event (e.g. *What was the name of the bar mentioned during the phone call? What was the logo on the woman's t-shirt?)*. As in Experiment 1, two experimenters agreed the correct answers to each question in advance, and responses were scored strictly against these answers.

Procedure

Participants arrived individually at a designated experimental room, which was set out as a waiting area with several props (such as a poster, and an umbrella). The experimenter informed the participant that a second participant was expected. Shortly afterwards, the experimenter led the stooge into the room, and asked her to take a seat while she went to set up the experiment they had volunteered for. The stooge then acted out the pre-arranged script, as described above, and left the room. The experimenter arrived 1 min later, and led the participant into a second test room.

At this point, the experimenter informed the participant of the true nature of the study, which was to test their memory for the event they had just witnessed. Once they had given their informed consent to continue, participants were randomly allocated to either a no-instruction or eye-closure condition, as in previous studies. The questions were then presented orally to the participant, who answered orally. Responses were recorded on a digital recorder for later coding.

Results and Discussion

The first analysis examined the number of correct answers volunteered by participants in response to the questions. The data can be seen in Table 1. Overall, there was a main effect of modality, $F(1,32) = 25.3$, MSE = 1.23, $p < .001$, $d = 1.78$, with more auditory information correctly recalled. In addition, there was a main benefit of eye-closure, $F(1,32) = 7.83$, MSE = 3.31, $p < .01$, $d = .99$, but no interaction between the two factors, $F < 1$. Overall, there were sizeable benefits of eye-closure on recall of both auditory ($d = .98$) and visual ($d = .71$) information.

More incorrect details were recalled for visual information than auditory information, $F(1,32) = 13.92$, MSE = .38, $p < .001$, $d = .93$. There was also a main effect of eye-closure, with fewer incorrect details recalled with eyes closed, $F(1, 32) = 9.46$, MSE = 1.69, $p < .01$, $d = –.78$. However there was no interaction between the two factors, $F < 1$. Eye-closure decreased incorrect recall for both visual ($d = –.88$) and auditory ($d = –1.16$) information. The result of this decrease in errors following eye-closure, together with an increase in hits, meant that eye-closure had a substantial impact upon accuracy rates. Following eye-closure 78.4%, *SD* = 18.4% of reported visual details were correct, and which contrasted with an accuracy rate of 62.8%, *SD* = 25.7% for the control condition, $d = .72$. For reported auditory details the equivalent accuracy rates were 92.2%, *SD* = 9.1% for eye-closure and 73.4%, *SD* = 19.9% for control, $d = 1.25$.

This study therefore replicated the pattern seen in Experiment 3, namely a benefit for correct recall of both visual and auditory material, with no hint of the interactive effect seen in Experiment 2. Unlike Experiment 3, however, the effects of eye-closure were also unambiguously beneficial for error reduction. Both visual and auditory errors were less frequent following instructed eye-closure. Thus, the beneficial effects of instructed eye-closure are apparent even for cued recall of incidentally encoded material, encountered live. The final study explored whether the benefit is also seen when free-recall was used at test following a live interaction.

Experiment 5

Method

Participants

Thirty four undergraduate participants took part for course credit or on a voluntary basis. No other details about participants were collected.

Materials

The materials were closely modelled on Experiment 4. A different female stooge was used, with different clothing

and appearance, and a modified phone-call, but the same basic structure of the event was followed. As a result of pilot work 31 target details of the event were identified (e.g. the name of a bar mentioned during the phone call, a logo on the t-shirt worn by the stooge). Because of an oversight, there were more auditory details (18) than visual details (13). Consequently, the data were rescaled, by multiplying the auditory details by 13/18, so that visual and auditory performance was scored out of 13 in each case.

Procedure

The procedure duplicated Experiment 4, except that at final test, participants were asked to provide a narrative account of the event they had witnessed, as in Experiment 3.

Results and Discussion

The verbal accounts of the event were scored for correct and incorrect descriptions of target details and the outcome is shown in Table 1. These data were analysed in the same manner as previous studies. Overall, there was a main effect of eye-closure on the recall of correct details of the event, $F(1,32) = 4.54$, MSE = 3.75, $p < .05$, $d = .75$. However, there was no main effect of modality on correct recall, $F < 1$, and no interaction between modality and eye-closure, $F < 1$. Thus, the previous effects of eye-closure were replicated for visual ($d = .39$) and auditory ($d = .55$) information. However, on this occasion, there was no effect of eye-closure on the recall of incorrect information, $F < 1$, nor any effect of modality $F < 1$, or interaction between the two factors, $F < 1$. Thus, eye-closure caused witnesses to recall more correct information, but with no cost of increased incorrect information. Because error rates were very low, accuracy rates across all conditions were close to ceiling, and so eye-closure did not impact on the proportion of correct answers volunteered. For visual details, 93.6%, $SD = 7.8\%$ of details were correct in the control condition, and 95.7%, $SD = 9.3\%$ of details were correct in the eye-closure, $d = .25$. For auditory details, control led to an accuracy rate of 96.6%, $SD = 5.9\%$, compared to 98.7%, $SD = 3.6\%$ in the eye-closure condition, $d = .44$.

Additionally, in this study, there was no evidence that witnesses took longer to recall in the eye-closure condition, $t(32) = .63$, $p < .54$, $d = .22$. Those with their eyes closed took an average of 96.9s (SD 25.5s), whilst those with their eyes open took an average of 91.7s (SD 22.7s).

General Discussion

With respect to the beneficial effects of eye-closure, 4 of the 5 studies replicate the Wagstaff et al (2004) study, with the exception (Experiment 2) showing an advantage for visual material only. They collectively demonstrate that instructed eye-closure can benefit both cued-recall and free-recall, for both visual and auditory materials, for events studied deliberately on video, and for incidentally encoded live interactions. Moreover, none of the test materials was shared across studies, and so the effects of instructed eye-closure appear quite robust against changes in materials.

The effect of instructed eye-closure is not only general, it is sizeable. Overall, ignoring all differences between the studies, instructed eye-closure had a beneficial effect on correct recall, with effect sizes ranging from $d = .06$ to $d = 1.66$, with an un-weighted average of $d = .98$. At the same time, instructed eye-closure reduced incorrect recall, with effect sizes ranging from $d = .24$ to $d = –1.02$, with an un-weighted average of $d = –.34$. This is a powerful combination, which delivers exactly what the police would wish for (more correct information, less incorrect information from witnesses), following a very simple intervention. Indeed, the outcome of the instructed eye-closure manipulation stands comparison with the results from the cognitive interview. Recall that Kohnken et al. (1999) meta-analysis of cognitive interview studies found an effect size of $d = .87$ for correct recall and $d = .28$ for incorrect recall. Clearly there are many differences between the studies in the meta-analysis and those reported here that preclude a definitive comparison, but the magnitude of the eye-closure effect does not appear to suffer in comparison. Moreover, the benefits of eye-closure are achieved with no increase in errors, no specialist training, and no greater complexity of interviewing technique.

This is not to suggest that the eye-closure technique should replace the cognitive interview, or that the benefits of the cognitive interview are mediated through eye-closure alone. Indeed, we already have some preliminary data to suggest that the benefits of eye-closure may be additive with the cognitive interview. In a pilot study with the local police, 17 trainee officers who were undergoing cognitive interview training conducted a videotaped interview with a witness to a mock-crime as a final assessment. Nine of the officers included an instructed eye-closure instruction as part of their cognitive interview, whilst the remaining 8 conducted a standard cognitive interview with the guidance that witnesses may be encouraged to close their eyes. We assessed the number of details recalled by witnesses in the free narrative phase of the interview and found that cognitive interview plus instructed eye-closure led to more correct recall than standard cognitive interview instructions

in which witnesses are told that they may close their eyes (d = .74), but there was no such difference for recall of incorrect details (d = .1).

The aim of the series of studies presented here was to test the generality of any eye-closure effect, and so the studies varied widely across the factors of test format (cued vs. free recall), test modality (auditory vs. visual) and the nature of the event (video vs. live interaction). Additionally, all studies used different events at study, and so different material was recalled at test. Consequently direct comparison across studies is problematic because they differ in a number of dimensions. Clearly, there is scope for more future research to address more closely the factors which might moderate the benefits of eye-closure on recall. In respect to this, the interaction between eye-closure and modality seen in Experiment 2 is clearly out of line with the subsequent studies. Our initial hypothesis was that eye-closure may have a beneficial effect through reduction of visual interference, but Experiments 3–5 clearly and consistently refute this hypothesis. Currently, we have no explanation for the discrepant pattern seen in Experiment 2.

In the final section, we will discuss potential reasons for the beneficial effects of eye-closure on witness recall. This section is naturally speculative, because our methods were not designed to adjudicate between competing theoretical accounts. Nevertheless, we hope that a preliminary discussion of potential explanations may promote research in this area in future.

Whenever people are free to report or withhold and answer, there is a possibility that differences between conditions represent changes in response bias. This idea is at the heart of classical signal detection theory (e.g. Green and Swets 1966), as well as in recent accounts of metacognitive control of witness behaviour (e.g. Koriat et al. 2000). However, we do not believe that a response bias effect can account for the present data set because the increase in correct recall seen following eye-closure is not accompanied by an increase in false-positive errors. Indeed, overall there is a corresponding decrease in false-positive errors. In signal-detection terms, this can only be achieved through an increase in discrimination, and not by a change in report bias.

A related, though perhaps distinguishable, account of the eye-closure effect might be through increases in witness motivation. Perhaps instructing witnesses to close their eyes makes them try harder at the recall task. This is a possibility, but care must be taken to disentangle what a motivational account would predict. Does trying harder mean that participants should spend more time on the task, that they should be more careful, or that they should try to output as much as they can? If trying harder means spending longer on the retrieval task, then the evidence is mixed. Witnesses did take longer to recall in Experiments 1 and 3, but not in Experiment 5. If eye-closure motivates participants to be more careful, then one must ask through what mechanism this extra care is achieved. The standard account of being careful would be a response bias shift towards conservative responding, but we have already argued against a response bias account of the data. The same argument applies to the converse idea that motivation has its impact through increasing output, which is normally conceived as a more lax criterion for report. A motivational account can only explain the present findings if it can explain the increase in discrimination, not if it relies on a shift in response bias.

Another potential explanation for the benefits of eye-closure is a reduction in interference. That is, closing the eyes reduces external stimulation, and so increases the capacity of the witness to concentrate on the memorial image. This account has the advantage that it offers a mechanism by which discrimination might be increased: greater resources dedicated to the memorial trace. However, a reasonable assumption of such an account might be that reduction in interference might be modality specific, in line with previous studies on cross-modal interference (e.g. Brooks 1967). The pattern seen for Experiment 2 was consistent with this account, but for Experiments 3–5, this pattern was not repeated.

Concentration, in the broader sense of the ability to focus on the task in hand (whatever the modality) must remain a possible explanation. The deleterious effects of dual-tasking on recall performance are well established. For example, a variety of evidence indicates that difficult memory retrieval, such as that required in some list learning and phonemic verbal fluency tasks, is impaired in dual task situations where the secondary task requires continuous monitoring (Moscovitch 1994; Troyer et al. 1997). In the same way, it may be that the standard interview situation can be conceived as a dual-task situation, in which the witness must simultaneously engage in difficult memory retrieval, and the social role of conversation management. Perhaps eye-closure has its effects through reducing the burden of monitoring the environment for social cues. The proposal that monitoring the presence of others may interfere with performance of complex and difficult tasks is well supported in the literature on social inhibition (see, for example, Bond and Titus 1983), and, in line with this, studies conducted at Liverpool University found that both verbal fluency and memory retrieval for a crime scene were adversely affected by the presence of observers (Wagstaff et al. 2007).

To finish, it may be worth considering a possible broader implication of the present data, which is that they may offer an important insight into one of the controversial issues that has dogged memory research, and eyewitness memory

research in particular, for decades: the effects of hypnosis on memory retrieval (Kleinhauz et al. 1977; Hibbard and Worring 1981; Erdelyi 1994; Wagstaff 1982, 1984, 1999). Whilst hypnosis may increase the frequency of false positive errors, it is also acknowledged that, especially in the field, hypnotic memory facilitation techniques often involve a number of features that may facilitate eyewitness memory (e.g. context reinstatement, increased rapport, and reduction of stress and anxiety; Wagstaff 1982, 1999). Our results suggest that eye-closure may be another, perhaps even more, influential feature in accounting for reports of memory facilitation with hypnosis. Virtually all standard hypnotic induction procedures include a suggestion for eye-closure (Barber 1969; Weitzenhoffer and Hilgard 1959; 1962); indeed, such is the importance of eye-closure in investigative interviewing with hypnosis, that investigators may be specifically instructed to close the witness's eyes manually if eye-closure does not occur spontaneously (Hibbard and Worring 1981).

The present data indicate that a simple instruction to close ones eyes reliably improves correct recall, with no need for an induction phase, no problems of participant drop-out because of lack of hypnotic susceptibility, and no accompanying increase in false positive errors. Whether hypnotic induction procedures produce superior memory beyond a simple eye-closure instruction is an issue awaiting investigation.

Summary

Across 5 experiments, instructed eye-closure appears to improve witness recall to an equivalent degree to that demonstrated by the cognitive interview, which is widely regarded as one of the major success stories of applied cognitive psychology, and which has been enthusiastically taken up by police forces in around the world. However, this intervention takes a matter of minutes to explain, requires no training, and produces no increases in incorrect recall. Thus, we argue that the issue of whether instructed eye-closure should be considered for inclusion as a component of witness interviewing is really an open and shut case.

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