Can questioning induce forgetting?

Applied Cognitive Psychology, *Appl. Cognit. Psychol.* **26**: 431–435 (2012)
Published online 14 December 2011 in Wiley Online Library (wileyonlinelibrary.com) **DOI**: 10.1002/acp.2815

Can Questioning Induce Forgetting? Retrieval-Induced Forgetting of Eyewitness Information

GINO CAMP[1]*, HENRIEKE WESSTEIN[1] and ANIQUE B. H. DE BRUIN[1,2]

[1]*Department of Psychology, Erasmus University Rotterdam, Rotterdam, The Netherlands*
[2]*Department of Educational Development and Research, Maastricht University, Maastricht, The Netherlands*

Summary: In eyewitness situations, questioning can be seen as a form of retrieval practice that may have detrimental effects on eyewitness memory. Memory research has demonstrated that retrieval practice may not only enhance memory for practiced information but also induce forgetting of related information. The present study examined the effect of retrieval practice on forgetting in eyewitness memory. First, we investigated whether asking questions about particular offender characteristics can induce forgetting of other offender characteristics. Second, we examined whether this forgetting effect is limited to information from the practiced offender or may also influence memory for characteristics of others present in the crime scene. Third, we studied whether forgetting of eyewitness information occurs in the absence of output interference effects. We found that questioning induced forgetting of offender characteristics. Moreover, the forgetting effect was not limited to information about the practiced offender. Finally, forgetting was found even when output order was experimentally controlled. Copyright © 2011 John Wiley & Sons, Ltd.

When an eyewitness is questioned about an event he or she witnessed, this involves retrieval of relevant information from memory. For example, when asked about the characteristics of an offender, eyewitnesses may retrieve the offender's eye colour or haircut from memory. Memory research has demonstrated that retrieving information from memory may enhance memory for the same information at a later time (e.g. Roediger & Karpicke, 2006). However, the very act of questioning may also impair the eyewitness's memory for information that is related to the information that was retrieved. For example, retrieving the offender's eye colour or haircut may induce forgetting of related offender characteristics that the eyewitness was not questioned about (e.g. his shoes, the colour of his pants). Thus, remembering may cause forgetting. This counterintuitive phenomenon, known as retrieval-induced forgetting (RIF) (e.g. Anderson, Bjork, & Bjork, 1994; Bäuml, 2002), has important implications for practical domains such as eyewitness memory. Retrieval of particular information in an eyewitness situation may lead to forgetting of related information from the eyewitness situation. If this occurs, valuable information may be lost.

Retrieval-induced forgetting has been investigated using the retrieval practice paradigm (e.g. Anderson et al., 1994; Anderson & Spellman, 1995). In this paradigm, participants first study category–exemplar pairs such as WEAPON–sword, WEAPON–bomb and FURNITURE–couch. Then, in the retrieval practice phase, participants retrieve half of the items from half of the categories from memory in a cued recall task (e.g. WEAPON–sw___). Finally, in the test phase, memory for all studied items is tested. Typically, practiced items such as *sword* are remembered better than control items from unpracticed categories such as *couch*. Crucially, memory for unpracticed items from practiced categories such as *bomb* is impaired compared with control items from unpracticed categories. This RIF effect has been attributed to inhibitory processes (e.g. Anderson, 2003; Levy & Anderson, 2002). In this account, competition between category members at retrieval practice (e.g. between *sword* and *bomb*) induces suppression of the non-target item (*bomb*) leading to forgetting of that item at test. Alternatively, the interference account of RIF proposes that, rather than suppression of the item itself, it is the strengthening of the association between the WEAPON and *sword* at retrieval practice that causes the forgetting effect (e.g. Camp, Pecher, & Schmidt, 2007; Perfect et al., 2004; Mensink & Raaijmakers, 1988). Both theories assert, however, that RIF is caused by retrieval practice with associated information.

The retrieval practice paradigm closely mimics the process of eyewitness questioning. Eyewitnesses are questioned about various aspects of the event they witnessed. For example, eyewitnesses may be interrogated about offender characteristics or actions that took place during the event. Following the results of the retrieval practice paradigm, retrieval of a subset of these characteristics or actions may induce forgetting of valuable information that is related to these characteristics or actions.

Retrieval-induced forgetting of eyewitness information

A number of studies have investigated whether RIF may occur in eyewitness situations. The typical procedure of these experiments is that participants were first shown information from a crime scene that could be classified into different categories. Then, participants practiced with half of the items from half of the categories. Finally, participants' recall was tested for all items of the studied categories. In most cases, these studies demonstrated a forgetting effect for unpracticed information from practiced categories. Forgetting was found for stolen items belonging to a specific category (MacLeod, 2002; Shaw, Bjork, & Handal, 1995; Saunders & MacLeod, 2006), for characteristics of criminals (MacLeod, 2002; Migueles & García-Bajos, 2007) and also for actions that are low in typicality rather than high in typicality (García-Bajos, Migueles, & Anderson, 2009). Taken together, these studies have demonstrated that RIF can be found for different types of materials that mimic real-life eyewitness situations, although RIF does not occur with all types of materials (see Migueles & García-Bajos, 2007,

*Correspondence to: Gino Camp, Department of Psychology, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR, Rotterdam, The Netherlands.
E-mail: camp@fsw.eur.nl

Experiment 1; Odinot, Wolters, & Lavender, 2009). Still, a number of important questions that are the focus of the present study remain.

The nature of the retrieval practice task

What causes the forgetting effect in RIF studies using eyewitness information? Studies investigating the RIF of eyewitness information intend to measure the effect of retrieval practice on eyewitness information. In RIF experiments using word pairs, the retrieval cue in the retrieval practice phase consists of the category name, followed by a two-letter word stem (e.g. WEAPON–sw___ for *sword*). However, in eyewitness situations, it is not possible or realistic to present pairs of category names and word stems. As a result, across the different studies investigating RIF in eyewitness situations, a variety of adaptations of the standard retrieval practice task have been used, often including different retrieval practice tasks within a single participant. Shaw et al. (1995) and MacLeod (2002) used a procedure in which questions that increased in difficulty were used. This was performed to maximize practice effects (MacLeod, 2002, p. 140). For example, the first retrieval practice question for the target item *Harvard sweatshirt* was 'I think my friend Julia wore her Harvard sweatshirt. Was there a Harvard sweatshirt on the desk?' The second question was 'Was there a grey sweatshirt on Janet's desk? If so, what was the name on the sweatshirt?' and the third question was 'Were there any sweatshirts on the desk? What was written on the sweatshirt?' Because it was not investigated what the effect of these different question types was in isolation, it is uncertain which question types attributed to the forgetting effects found in these experiments. It could be that the forgetting effect is caused at least in part by presenting aspects of the original target item in the question. Similarly, Shaw et al. (1995) and Migueles and García-Bajos (2007) presented the target of parts or the target in the first retrieval practice trials (e.g. 'The blonde man is about 20 y___' for the target item *20 years* in Migueles and García-Bajos). This may have strengthened the association between the target and the category and may have reduced the probability that other category examples would be retrieved when using the category as the cue in the final test phase. If this were the case, then retrieval would not be crucial in inducing forgetting of related information. Also, it is unlikely that targets themselves or word stems of targets are used in questioning situations because this information is unknown to the interrogator. Moreover, it may very well be that the questions containing word stems were primarily responsible for the forgetting effect found in this study because these questions more strongly resemble the type of question used in experiments using category–exemplar pairs.

We therefore examined the effect of retrieval practice on forgetting of related eyewitness information using questions as they could be asked by police officers in the absence of other types of retrieval practice questions that may add to or even be responsible for the forgetting effect. We used only one type of retrieval practice question that mimicked as closely as possible the type of question a witness would likely be asked when he or she is interrogated, such as 'What kind of trousers was he wearing?' or 'What kind of haircut did he have?' We hypothesized that retrieval practice would still induce forgetting when the retrieval practice task would be solely based on retrieval of the target because both inhibition theory (e.g. Levy & Anderson, 2002) and interference theory (e.g. Camp et al., 2007) predict that retrieving targets at retrieval practice induces forgetting of other category members at test.

Effects of retrieval practice beyond the practiced category

The second question that was addressed in this study concerns the scope of the effects of retrieval practice on other items in memory. Retrieval practice with particular eyewitness information (e.g. the offender's haircut) may not only induce forgetting of directly related information (e.g. the colour of the offender's trousers) but also affect memory for other information from the event (e.g. the victim's hair colour). In studies using category–exemplar pairs as study materials, it has been shown that retrieval practice can also impair recall of items from other categories than the practiced category (e.g. Anderson & Spellman, 1995). This occurs when items from other categories share features with the items that were forgotten because of retrieval practice (Anderson & Spellman, 1995; Anderson, Green, & McCulloch, 2000). This may also occur when the items from other categories share features with the practiced items, because these items may compete for activation at retrieval practice. In line with these predictions, Saunders and MacLeod (2006, Experiment 2) demonstrated that retrieval practice with a subset of items stolen from a house not only induced forgetting of other items from the same house but also induced forgetting of items from another house that was not practiced. Forgetting occurred for items related to practiced items as well as for items related to unpracticed items from the practiced house.

In other studies, a between-subjects control group that did not receive retrieval practice was added to investigate the effect of retrieval practice on items from control categories (MacLeod, 2002; Migueles & García-Bajos, 2007; Shaw et al., 1995). No effects of retrieval practice on control items were found in these studies. In the current study, however, we used a within-subjects design to assess the effect of retrieval practice on control items from categories that were not practiced. We hypothesized that retrieval practice would also induce forgetting of control items from unpracticed categories (i.e. characteristics of the unpracticed offender). Control items can compete for activation with practiced items because they share the same retrieval cue (e.g. haircut or hair colour), which could lead to forgetting of control items.

Output interference

In all studies in which RIF was found in an eyewitness situation, free recall was used to test memory during the final test phase. In free recall tests, participants are asked to reproduce as many items as they can in any order. A problem of using free recall tests in the retrieval practice paradigm is that output interference can contribute to the forgetting effect (e.g. Anderson, 2003; Anderson & Bell, 2001). Typically, practiced items are recalled first in a free recall test because they were previously strengthened. This can lead to further

impairment of recall for unpracticed items from practiced categories relative to control items from unpracticed categories. This impairment based on output interference may add to or even cause the forgetting effect. Two studies on RIF in eyewitness situations have used *post hoc* tests to determine the effects of output interference on the forgetting effect and found no effect of output order (García-Bajos et al., 2009; MacLeod, 2002). However, none of the studies on RIF in eyewitness situations controlled output order in their experimental design. A simple way to accomplish this is to use questions that are specific for only one experimental item in the final test phase. When specific questions are used, practiced items can be tested last in the test sequence, thereby eliminating the effect of output interference. We hypothesized that the RIF effect would still occur when the effect of output order was eliminated because both inhibition theory (e.g. Levy & Anderson, 2002) and interference theory (e.g. Camp et al., 2007) predict forgetting due to the act of retrieval in the retrieval practice phase. Because we were interested solely in the effect of retrieval practice on forgetting, we tested practiced items last in our experiment.

METHOD

Participants

The participants in the experiment were 76 psychology students at Erasmus University Rotterdam. All were proficient speakers of Dutch and received course credit for participation.

Materials and design

We chose the robbery video used by Migueles and García-Bajos (2007) as the study material because this short (50 seconds) and fast-paced video of a robbery closely mimics a real-life eyewitness situation. The video portrays a man withdrawing money from a cash machine who is robbed by a blonde and a dark-haired man. The offenders flee and are followed by a security guard who chases them across a mall, knocking several people over. The offenders then run down the steps of an escalator and escape. The offender characteristics about which the participants were questioned were based on the characteristics used by Migueles and García-Bajos in their second experiment. Migueles and García-Bajos used 12 characteristics for each offender. The retrieval practice questions we used were based on the questions used by Migueles and García-Bajos in the second part of the retrieval practice phase. These were questions that could have been asked by police officers interrogating eyewitnesses (e.g. 'What kind of haircut did the offender have?') about the appearance of the offenders. The 24 characteristics and their corresponding questions were translated into Dutch. A pilot study ($N = 7$) was used to determine whether the translated characteristics and questions were clear and whether they produced the correct answers. Eleven of the 24 characteristics were removed because their corresponding questions were answered incorrectly by most participants (six questions) or because they were answered correctly by most participants (five questions) in the pilot study. They were replaced by seven new characteristics, resulting in a total of 20 characteristics, 10 per offender. For each offender, six characteristics concerned clothing, three characteristics concerned facial features, and one characteristic concerned build (see Appendix). The terms *blonde offender* and *dark-haired offender* were used to identify the robbers.

Two sets of questions (set A and B) were created for each offender. Each set contained questions about five different characteristics. Participants practiced with one set of the characteristics of one of the offenders. The items in the practiced set are called Rp+ items (e.g. the blonde offender's haircut). Unpracticed characteristics of the same offender are called Rp− items (e.g. the colour of the blonde offender's trousers). The characteristics of the unpracticed offender served as corresponding control items for each of these item types. These items are called Nrp+ items (e.g. the dark-haired offender's haircut) and Nrp− items (e.g. the colour of the dark-haired offender's trousers). Thus, we used a within-subjects design with item type (Rp+, Rp−, Nrp+, and Nrp−) as the independent variable and test recall as the dependent variable. Each item served as Rp+, Rp−, Nrp+ or Nrp− item, an equal amount of times across participants (see Camp, Pecher, & Schmidt, 2005; Camp et al., 2007). RIF was measured by comparing recall of Rp− items with recall of Nrp− items.

The distinction between Nrp+ and Nrp− items enabled us to assess whether retrieval of Rp+ items not only induced forgetting of Rp− items but also influenced recall of their corresponding Nrp+ items. It may be possible that retrieval practice of particular characteristics of one offender may affect memory for the corresponding characteristics of the other offender. For example, if the haircut of the blonde offender was practiced, this may influence later recall of the haircut of the dark-haired offender. Retrieval practice with a particular characteristic of one offender (e.g. *ponytail*) may lead to RIF of the corresponding characteristic of the other offender (e.g. *partition in the middle*) because they share the same retrieval cue ('What kind of haircut did the offender have?') (Saunders & MacLeod, 2006). To assess this, we compared recall of Nrp+ items with recall of Nrp− items.

Procedure

Participants were tested individually or in small groups of up to four people. The experiment, following the retrieval practice paradigm (Anderson & Spellman, 1995), consisted of four phases: a study phase, a retrieval practice phase, a distracter phase and a test phase.

In the study phase, participants were informed that they were going to see a video of a crime scene and were asked to pay close attention because they would later be questioned about it. The 50-second video of the robbery was then shown on the computer screen.

In the retrieval practice phase, participants were informed that they would receive a number of questions about the video and that they had 10 seconds to type their answer by using the keyboard. The set of five retrieval practice questions was then presented one by one in random order. The term *blonde offender* or *dark-haired offender* was presented at the top of the screen to identify to whom the question referred. This procedure was repeated twice; so, there were

three rounds of practice. The retrieval practice phase was followed by a 5-minute distracter phase in which participants performed a visual problem-solving task.

In the final test phase, memory for all 20 items was tested using the item-specific questions that we constructed. Participants were given 10 seconds for each question to type the correct answer by using the keyboard. To control for output order effects, the Rp−, Nrp+ and Nrp− items were tested first in random order. This enabled us to compare recall of Rp− item and Nrp− items to determine if RIF would occur. Also, this enabled us to compare recall of Nrp+ and Nrp− items to determine whether retrieval practice with Rp+ items affected recall of the corresponding Nrp+ items. Rp+ items were tested last in random order.

RESULTS

Participants' responses were scored using a loose criterion because the exact description of the features presented in the Appendix were never presented to the participants, as they watched a video in the study phase. Therefore, typing and spelling errors were ignored and synonyms were also rated as correct (e.g. 'trousers' was rated as correct for the feature 'bottoms'). All responses were scored by the second author. To assess the reliability of the scoring procedure, 40% of the responses in the test phase were also scored by the first author, and the overlap in scoring was 98% (629 out of the 640 responses). Both raters were unaware of the experimental condition of the items.

The average retrieval practice success rate was 54.65% ($SD = 24.20$). Recall percentages for the different item types in the test phase can be found in Table 1. To assess whether questioning of a subset of the characteristics of an offender caused forgetting of other characteristics of the same offender, we compared recall of Rp − items with recall of Nrp − items. A forgetting effect was found, $t(75) = 2.37$, $p < .05$, $d = .34$. To assess how questioning of a subset of the characteristics of an offender influenced recall of corresponding characteristics of the second offender, we compared recall of Nrp+ items with Nrp− items. Again, a forgetting effect was found, $t(75) = 2.20$, $p < .05$, $d = .28$. These results indicate that asking questions involving retrieval of particular offender characteristics (e.g. the offender's haircut) can not only induce forgetting of other characteristics of that same offender (e.g. the colour of his trousers) but also forgetting of the same characteristics of a different offender (e.g. the second offender's haircut).

As a subsidiary issue, retrieval practice did not seem to lead to facilitation of the practiced characteristics as there was no significant difference between recall of Rp+ items and Nrp+ items, $t(75) = 1.53$, $p = .13$, $d = .23$. However, the lack of a significant facilitation effect can easily be explained by the fact that Rp+ items were tested later in the test sequence than their corresponding Nrp+ control items. This was performed deliberately to make enable the previously presented comparison between the recall of Nrp+ and Nrp− items.

DISCUSSION

The first aim of the current study was to assess whether questions that could be asked during eyewitness interviews about offender characteristics can induce forgetting of related offender characteristics. Previous studies found forgetting of related eyewitness information after questioning (Migueles & García-Bajos, 2007; MacLeod, 2002; Shaw et al., 1995) but used different types of retrieval practice questions within a single participant in which either the target item itself or a word stem of the target item was presented. However, this is highly unlikely in eyewitness situations because the target information is inherently unknown to the questioner. Also, this made it difficult to assess the individual contribution of questions that could be asked by the police in eyewitness interviews to the forgetting effect. In our experiment, we found a forgetting effect by using only questions as they could be used by police officers or judges in eyewitness interviews. This indicates that forgetting can be induced by questioning an eyewitness in the absence of other types of retrieval practice questions that are not likely to occur in eyewitness situations.

Moreover, our results show that the forgetting effect was not limited to information about the offender about who the participants were questioned. Forgetting also occurred for information about the other offender that was similar to the practiced information. For example, if a participant was questioned about the blonde offender's haircut, then this not only induced forgetting of other characteristics of the blonde offender (e.g. the colour of his trousers) but also induced forgetting of corresponding characteristics of the dark-haired offender (e.g. the dark-haired offender's haircut). This study is the first to find forgetting of offender characteristics beyond the category that received retrieval practice (e.g. the blonde offender). This is particularly interesting because previous studies using word pairs as the study material have demonstrated that similarity between practiced and unpracticed items may reduce the forgetting effect

Table 1. Means and standard errors of the mean of the recall percentages of Rp+, Rp−, Nrp+ and Nrp− items

	Rp+ items	Rp− items	Nrp+ items	Nrp− items	RIF for Rp− items	RIF for Nrp+ items
Mean (SEM)	51.32 (3.36)	43.68 (2.92)	45.0 (3.0)	52.89 (3.35)	9.21* (3.88)	7.89* (3.59)

Note. *Rp+ items* are practiced characteristics of the practiced offender (e.g. blonde offender's haircut); *Rp− items* are unpracticed characteristics of the practiced offender (e.g. colour of trousers of blonde offender); *Nrp+ items* are characteristics of the unpracticed offender that correspond with Rp+ characteristics (e.g. dark-haired offender's haircut); and *Nrp− items* are characteristics of the unpracticed offender that correspond with Rp− characteristics (e.g. colour of trousers of dark-haired offender). *RIF for Rp− items* represents forgetting of unpracticed characteristics of the practiced offender (e.g. colour of trousers of blonde offender); *RIF for Nrp + items* represents forgetting of the same characteristics as the Rp+ characteristics of the unpracticed offender (e.g. dark-haired offender's haircut).
RIF, retrieval-induced forgetting.
*$p < .05$.

(Anderson et al., 2000; Bäuml & Hartinger, 2002). We believe that questioning did induce forgetting of similar characteristics of the other offender in the current study because these characteristics shared the same retrieval cue (e.g. 'What kind of haircut did the offender have?'). According to inhibition theory (Anderson, 2003; Levy & Anderson, 2002), the retrieval practice question (e.g. 'What kind of haircut did the offender have?') induced competition between the blonde and the dark-haired offender's haircuts, resulting in the suppression of the non-target haircut. Alternatively, interference theory can explain this result by maintaining that retrieval practice with the blonde-haired offender's haircut strengthened the association between this haircut and the retrieval practice question. Consequently, this reduced the probability that the dark-haired offender's haircut would be retrieved using the retrieval practice question as the cue in a later memory test (e.g. Camp et al., 2007; Perfect et al., 2004; Mensink & Raaijmakers, 1988).

The third aim of our study was to assess the contribution of output interference to the forgetting effect in eyewitness situations. As output order was not controlled in previous studies (García-Bajos et al., 2009; Migueles & García-Bajos, 2007; MacLeod, 2002; Shaw et al., 1995), it is difficult to determine the individual contributions of retrieval practice and output interference to the forgetting effect. The current study tested the effect of output order directly by controlling output order experimentally, and a forgetting effect was still found. This indicates that retrieval practice in the form of questioning can induce forgetting of eyewitness information in the absence of output interference. This result is in line with *post hoc* output order analyses in other eyewitness studies (García-Bajos et al., 2009; MacLeod 2002).

Our findings suggest that using questions that induce competition between offender characteristics should be avoided during eyewitness interviews as these types of question can induce forgetting of related eyewitness information.

ACKNOWLEDGEMENTS

The authors thank Malen Migueles and Elvira García-Bajos for enabling them to use the robbery video and the interview questions that they used for their 2007 paper in Applied Cognitive Psychology.

REFERENCES

Anderson, M. C. (2003). Rethinking interference theory: Executive control and the mechanisms of forgetting. *Journal of Memory and Language*, *49*, 415–445.

Anderson, M. C., & Bell, T. (2001). Forgetting our facts: The role of inhibitory processes in the loss of propositional knowledge. *Journal of Experimental Psychology. General*, *130*, 544–570.

Anderson, M. C., & Spellman, B. A. (1995). On the status of inhibitory mechanisms in cognition: Memory retrieval as a model case. *Psychological Review*, *102*, 68–100.

Anderson, M. C., Bjork, R. A., & Bjork, E. L. (1994). Remembering can cause forgetting: Retrieval dynamics in long-term memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *20*, 1063–1087.

Anderson, M. C., Green, C., & McCulloch, K. C. (2000). Similarity and inhibition in long-term memory: Evidence for a two-factor theory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *26*, 1141–1159.

Bäuml, K. (2002). Semantic generation can cause episodic forgetting. *Psychological Science*, *13*, 356–360.

Bäuml, K., & Hartinger, A. (2002). On the role of item similarity in retrieval-induced forgetting. *Memory*, *10*, 215–224.

Camp, G., Pecher, D., & Schmidt, H. G. (2005). Retrieval-induced forgetting in implicit memory tests: The role of test awareness. *Psychonomic Bulletin and Review*, *12*, 490–494.

Camp, G., Pecher, D., & Schmidt, H. G. (2007). No retrieval-induced forgetting using item-specific independent cues: Evidence against a general inhibitory account. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *33*, 950–958.

García-Bajos, E., Migueles, M., & Anderson, M. C. (2009). Script knowledge modulates retrieval-induced forgetting for eyewitness events. *Memory*, *17*, 92–103.

Levy, B. J., & Anderson, M. C. (2002). Inhibitory processes and the control of memory retrieval. *Trends in Cognitive Sciences*, *6*, 299–305.

MacLeod, M. (2002). Retrieval-induced forgetting in eyewitness memory: Forgetting as a consequence of remembering. *Applied Cognitive Psychology*, *16*, 135–149.

Mensink, G. J. M., & Raaijmakers, J. W. (1988). A model of interference and forgetting. *Psychological Review*, *95*, 434–455.

Migueles, M., & García-Bajos, E. (2007). Selective retrieval and induced forgetting in eyewitness memory. *Applied Cognitive Psychology*, *21*, 1157–1172.

Odinot, G., Wolters, G., & Lavender, T. (2009). Repeated partial eyewitness questioning causes confidence inflation but no retrieval-induced forgetting. *Applied Cognitive Psychology*, *23*, 90–97.

Perfect, T. J., Stark, L. J., Tree, J. J., Moulin, C. J. A., Ahmed, L., & Hutter, R. (2004). Transfer appropriate forgetting: The cue-dependent nature of retrieval-induced forgetting. *Journal of Memory and Language*, *51*, 399–417.

Roediger, H. L., & Karpicke, J. D. (2006). Test-enhanced learning: Taking memory tests improves long-term retention. *Psychological Science*, *17*, 249–255.

Saunders, J., & MacLeod, M. D. (2006). Can inhibition resolve retrieval competition through the control of spreading activation? *Memory and Cognition*, *34*, 307–322.

Shaw, J. S., Bjork, R. A., & Handal, A. (1995). Retrieval-induced forgetting in an eyewitness paradigm. *Psychonomic Bulletin and Review*, *2*, 249–253.

APPENDIX

Retrieval practice and test questions and offender characteristics

Retrieval practice and test question	Blonde offender	Dark-haired offender	Retrieval practice set
What type of trousers was he wearing?	Wide trousers	Track suit bottoms	A
What colour were his trousers?	Red and white	Dark blue	A
What kind of build did he have?	Thin build	Normal build	A
What pattern was printed on his trousers?	Chequered pattern	White stripes	A
What was the shape of his face?	Long face	Round face	A
What kind of upper garments was he wearing?	T-shirt and vest	T-shirt	B
What colour was the picture/pattern on his shirt?	Black	White	B
What kind of hair did he have?	Long straight hair	Curly hair	B
What kind of haircut did he have?	Ponytail	Partition in the middle	B
What was the colour of his T-shirt?	Grey	Light blue	B