

## Acceptance and Confidence of Central and Peripheral Misinformation

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We examined the memory for central and peripheral information concerning a crime and the acceptance of false information. We also studied eyewitnesses' confidence in their memory. Participants were shown a video depicting a bank robbery and a questionnaire was used to introduce false central and peripheral information. The next day the participants completed a recognition task in which they rated the confidence of their responses. Performance was better for central information and participants registered more false alarms for peripheral contents. The cognitive system's limited attentional capacity and the greater information capacity of central elements may facilitate processing the more important information. The presentation of misinformation seriously impaired eyewitness memory by prompting a more lenient response criterion. Participants were more confident with central than with peripheral information. Eyewitness memory is easily distorted in peripheral aspects but it is more difficult to make mistakes with central information. However, when false information is introduced, errors in central information can be accompanied by high confidence, thus rendering them credible and legally serious.  
*Keywords:* eyewitness memory, false memories, misinformation paradigm, central and peripheral information, confidence.

Estudiamos la aceptación de información falsa y la memoria de contenidos centrales y periféricos sobre un crimen. Además, también nos interesamos por la confianza que los testigos tienen en su memoria. Los participantes vieron un vídeo sobre un robo a un banco, inmediatamente después completaron un cuestionario con preguntas en las que se introdujo información falsa sobre contenidos centrales y periféricos y, un día después, completaron una prueba de reconocimiento en la que también indicaron su confianza en la respuesta. El rendimiento fue mejor con contenidos centrales y hubo más falsas alarmas con periféricos. Este resultado puede explicarse a partir de la limitada capacidad atencional del sistema cognitivo y de la mayor capacidad informativa de los contenidos centrales, que puede promover su procesamiento preferencial. La presentación de información falsa empeoró el testimonio al provocar un criterio de respuesta más laxo y la confianza fue mayor ante contenidos centrales que periféricos. Se concluye que es fácil alterar la memoria de un testigo sobre aspectos periféricos, pero es más difícil con aspectos centrales. Sin embargo, cuando se presenta información falsa, los errores con información central pueden evaluarse con confianza alta, lo que los haría potencialmente creíbles y peligrosos en el sistema judicial.

*Palabras clave:* memoria de testigos, falsas memorias, paradigma de la información engañosa, información central y periférica, confianza.

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Eyewitness testimony may contain different types of information, although not all of them are equally important from a legal perspective. One way to classify information type is to distinguish between central information, which includes actions and details essential to an event, and peripheral information, irrelevant to or removed in time and space from the main action (Christianson, 1992a). Central information clearly plays a more prominent role in reconstructing events, although the importance of peripheral information should not be underestimated. Judges and juries base eyewitness credibility, among other things, on the amount of details included in a declaration, even if they are insignificant or not directly related to the event (Bell & Loftus, 1988, 1989).

In addition, central and peripheral contents are not remembered equally. The divergence between the two has mainly been studied in connection with the emotional activation of a situation (for review, see Christianson, 1992a). The most common outcome seen in studies of this type is that when dealing with central information memory is better for emotional than for neutral situations, while peripheral information is more readily remembered in neutral than in emotional situations (Brown, 2003; Burke, Heuer, & Reisberg, 1992; Christianson & Loftus, 1990, 1991; Heuer & Reisberg, 1990). When performance for both contents are compared directly, witnesses also produce better results for central than for peripheral information in laboratory studies (Ibabe & Sporer, 2004; Migueles & García-Bajos, 1999), research on the memory for real-life crimes (Christianson & Hübner, 1993), and in autobiographical traumatic experiences (Wessel & Merckelbach, 1994). Both results are explained by Easterbrook's (1959) *attentional narrowing hypothesis*, which Christianson (1992a, 1992b) adapted to memory for emotional events. According to this theory human attentional capacity is limited. When our emotions are activated our attention is drawn to aspects central to the event, leaving limited attentional resources for processing peripheral aspects outside the attentional focus. Heuer and Reisberg (1992) elaborated on this hypothesis, indicating that central information also has greater distinctiveness and informativeness than peripheral information, which may lead us to prioritise our attention and enhance our memory performance with central information.

Witness accounts can also be altered and not remain faithful to reality. One of the most common ways of altering a memory is through prior exposure to misinformation. For example, if a car runs a *stop sign*, but someone tells us it was a *yield sign*, our memory may be altered so that when we give testimony we claim there was actually a yield sign (Loftus, Miller, & Burns, 1978). This phenomenon is known as the *misinformation effect*. However, it is not the same for a witness' memory to be altered for central aspects, which determine what happened and when, as it is for peripheral contents, which add little

relevant information. In spite of this, few studies have directly compared the impact on memory of misleading central and peripheral contents. Luna and Migueles (2006) analysed the type of false information used in 74 experiments on the misinformation effect and found that 51% used only peripheral information, 11% used only central information, and only 8% of the experiments manipulated the type of false information, whether central or peripheral. This suggests that much of what we know about the misinformation effect comes from the study of peripheral contents, which can offer a biased view about the suggestibility of memory. In this study we manipulated the type of false information, central and peripheral, using material with ecological validity. Rather than more commonly used materials, such as photographs or static slides, which distance the experimental situation from the vibrancy of real-life situations, we used a video of a bank robbery.

Post-event information experiments aimed at examining the effect of the type of information typically indicate better performance with central contents; therefore, it is generally concluded that false peripheral contents are more readily accepted. Wright and Stroud (1998), for instance, introduced central and peripheral misinformation about a robbery of a store and found the misinformation effect for peripheral but not for central items. Roebbers and Scheiner (2000) observed the same result with a group of adults and children aged 6 to 10. Sutherland and Hayne (2001) also found greater accuracy for central information, and when analysing errors found a clear misleading information effect, which was accentuated for peripheral contents. Dalton and Daneman (2006) found greater acceptance of misinformation for peripheral information, although to a certain extent the participants in their study also accepted central misinformation. However, other findings are not so clear. For example, Luna and Migueles (2005) found more hits with central information and more false alarms with peripheral information, but no differences in the misinformation effect as a function of type of information. Heath and Erickson (1998) concluded that "peripheral items were more strongly influenced by misleading information than were central items" (p. 342), although this assertion is not well supported by the data given in this article.

In short, it seems clear that witnesses are better at remembering central than peripheral information, and most of the empirical evidence supports the claim that it is easier to accept peripheral misinformation than it is to accept central misinformation. According to Easterbrook's attentional narrowing hypothesis (1959) and bearing in mind the greater information capacity of central contents (Burke *et al.*, 1992; Heuer & Reisberg, 1992), we would expect to find better performance with central information. This should be seen in the way of a greater reluctance to accept false central items and more errors for peripheral

information. To evaluate this hypothesis a number of indexes were calculated based on Signal Detection Theory (SDT): hits, false alarms and the accuracy score  $A'$ . The  $A'$  index is particularly interesting, since it takes into account the rate of hits and false alarms and therefore gives a more objective measurement of performance.

Another important aspect to consider when assessing testimony is how credible it appears. Even the most useful information, e.g. central information, will be ineffective if it is presented as dubious, since judges and juries tend to believe the more self-assured witnesses (Krug, 2007; Wells, Lindsay, & Ferguson, 1979; Wise & Safer, 2004). An error made with high confidence is more likely to sway a jury verdict than one made with low confidence. Therefore, we should ask ourselves what type of information is attached to higher confidence and may therefore be more credible, and what the most important types of errors are from a judicial standpoint.

Some studies have examined confidence when false information is introduced, concluding that misinformation can be accepted with high confidence (Dalton & Daneman, 2006; Loftus et al., 1978, Exp. 3; Loftus, Donders, Hoffman, & Schooler, 1989). In the same direction, Luna and Migueles (2007) found that presenting false information not only increases its acceptance but also increases the degree of the confidence in the acceptance compared to a group that was given no misinformation. Other studies have examined confidence for central and peripheral information but have not included false items. Results indicate that central information is evaluated with higher confidence than peripheral information. For example, Migueles and Garcia-Bajos (1999) found higher confidence for central information than for peripheral information in both hits and false alarms, but Ibabe and Sporer (2004) found this to be the case only for correct responses. Although the general conclusion from these studies is that participants are more confident about their responses for central information, the outcome is not so clear when it comes to errors. Here we hypothesize that if presenting false information increases confidence, and if central contents are also generally assessed with greater confidence, then participants might evaluate these contents with higher overall confidence. This means that false recognition associated with central information would appear more credible and although they may be fewer in number, could give rise to serious errors in the courtroom.

In summary, we propose an ecological experiment in which false central and peripheral contents are presented in a forensic context and information on participants' memory and confidence is collected. We expect to obtain better performance for central than for peripheral contents, which could result in greater acceptance of the peripheral misinformation. Similarly, we also expect central contents to be given greater confidence ratings. This means that

when participants erroneously accept false central information, they may do so with a high level of confidence.

## Method

### *Participants*

A total of 55 psychology students from the University of the Basque Country participated in this experiment (41 women, 14 men), mean age 21.15 years,  $SD = 3.32$  (range 19–35).

A mixed factorial design 2 (Misinformation: with or without)  $\times$  2 (Type of information: central, peripheral) was used, between-subjects measures on the first variable and repeated measures on the second. The misinformation group was made up of 28 participants and the non-misinformation group, 27. The participants were assigned randomly to each group.

### *Materials and procedure*

A normative study was conducted to determine whether an item was central or peripheral. A group of 15 people watched a video of a bank robbery in which two security guards take some sacks of money to the safe deposit room in a bank and drive away. A bank robber stationed nearby cuts off the power supply to the building, walks into the bank in disguise, threatens the people inside and makes off with the money. The incident unfolds with no explicit violence and lasts a total of three minutes. After watching the video, the participants were given a booklet with 56 sentences describing the event in chronological order. The sentences were either true or false. The participants were asked to rate the contents on a scale of 1 'very peripheral' to 6 'very central'. Although different authors use different definitions for central and peripheral (e.g. Burke *et al.*, 1992; Gobbo, 2000; Heath and Erickson, 1998), we used the widely accepted definition given by Christianson (1992a). The answer booklet included a definition of the terms central and peripheral so that all participants would use the same criteria. Based on the information obtained, two experts in Eyewitness Memory selected the true and false contents to be used in the experiment. Any doubts were resolved by a third independent judge. The central information selected was given a mean rating of 4.93 ( $SD = 0.62$ ), and the peripheral information, 1.75 ( $SD = 0.61$ ). This difference was significant [ $t(14) = 14.29$ ;  $p < 0.001$ ]. All of the central and peripheral items used in the experiment, both true and false, and their scores are shown in the Appendix.

In the first session groups of up to 14 participants were given intentional learning instructions before watching the bank robbery video. They were told that afterwards they would be asked a series of questions concerning the event. The participants then performed two filler tasks lasting

five minutes each. The first involved solving 50 anagrams (unscrambling sets of six-letter words); the second consisted in completing a maze and creating a picture by filling in the dots. They were then given a post-event questionnaire containing 37 open-ended questions in chronological order, and asked to respond with short answers. In addition to their responses, the participants were asked to rate their confidence on a scale of 1 ‘no certainty’ to 5 ‘absolute certainty’. The purpose of the questionnaire was to introduce false information. Since we rarely have to make confidence judgements in everyday life, the questionnaire included the scales so that the participants could get used to them. The answers were not taken into account for subsequent analysis.

There were two versions of the questionnaires. In the questionnaire designed for the misinformation group eight of the questions included misinformation. The false items were never the actual point of the question, but rather presented as extra information. Four of them referred to central information (e.g. “The robber wore *leather gloves* he wouldn’t leave any fingerprints, but how did he conceal his identity?”) and four to peripheral information (e.g. “There was a young man beside the door *withdrawing money* from a cash dispenser. What did the robber do to him?”). There were never two questions in a row containing false information. The rest were filler questions about different aspects of the video. The questionnaire used for the non-misinformation group was identical except that all references to misinformation were removed.

The following day the participants completed a *True-False* memory recognition test. They were told to base their answers on the video and to rate their response confidence using the same scale of 1 to 5 as they did in the questionnaire. The test consisted of 24 items, eight with true information appearing in the video (e.g. “The robber wore *beige work overalls*”) and eight containing misinformation included in the questionnaire (e.g. “The robber had *a gun* holstered to his belt”). In each case four items were central and four were peripheral. The other eight sentences were filler items. There were no two sentences of the same type in a row. No time limit was set for completing the task.

## Results

Using the data collected from the recognition task, we calculated the percentage of hits and false alarms,  $A'$  accuracy (Snodgrass & Corwin, 1988) and  $B''_D$  scores, which indicate the type of response criterion adopted by participants (Donaldson, 1992). These data were analysed using four 2 (Misinformation: with, without)  $\times$  2 (Type of information: central, peripheral) two-ways mixed ANOVAs. All of the assumptions needed for this analysis were fulfilled. The scores are provided in Table 1. Two ANOVAs were also run for confidence in hits and false alarms to examine the relationship between type of information and this measurement.

### Hits

There were more hits for central ( $M = 0.61$ ) than peripheral information ( $M = 0.50$ ) [ $F(1, 53) = 4.18$ ;  $p > .046$ ;  $\eta^2 = 0.07$ ]. No differences were found between the misinformation group ( $M = 0.58$ ) and the non-misinformation group ( $M = 0.54$ ) and there was no interaction between the two variables.

### False alarms

The participants assigned to the group with false information more readily accepted the false items than did the non-misinformation group ( $M = 0.67$  vs.  $M = 0.35$ ) [ $F(1, 53) = 39.07$ ;  $p < .001$ ;  $\eta^2 = 0.42$ ]. There were also more false alarms for peripheral ( $M = 0.65$ ) than for central information ( $M = 0.37$ ) [ $F(1, 53) = 38.51$ ;  $p < .001$ ;  $\eta^2 = 0.42$ ]. The interaction between the two variables was not significant [ $p = 0.93$ ]. The difference in false alarms between the experimental group and the control group, which is the misinformation effect measure, was the same for central information [ $0.53 - 0.21 = 0.32$ ;  $t(53) = 4.37$ ;  $p < .001$ ] and peripheral information [ $0.81 - 0.49 = 0.32$ ;  $t(53) = 5.00$ ;  $p < .001$ ]. This outcome indicates that the misinformation effect was present in both contents, but that the effect of prior exposure to false information was similar in both.

Table 1  
Proportions of hits, false alarms,  $A'$  and  $B''_D$  as a function of Misinformation and Type of information

	With misinformation		Without misinformation	
	Central	Peripheral	Central	Peripheral
Hits	0.64	0.51	0.57	0.50
False Alarms	0.53	0.81	0.21	0.49
$A'$	0.56	0.32	0.71	0.50
$B''_D$	-0.19	-0.45	0.30	0.01

*A'* and *B''<sub>D</sub>*

*A'*<sup>1</sup> is an indicator of overall accuracy which ranges from 0 to 1, where 0 is very low accuracy and 1 is very high accuracy. An *A'* score of 0.5 indicates chance performance. Non-misinformation participants ( $M = 0.60$ ) were more accurate than those with misinformation ( $M = 0.44$ ) [ $F(1, 53) = 16.48$ ;  $p < .001$ ;  $\eta^2 = 0.24$ ], since they produced fewer false alarms. Accuracy was also higher for central ( $M = 0.63$ ) than for peripheral information ( $M = 0.41$ ) [ $F(1, 53) = 35.13$ ;  $p < .001$ ;  $\eta^2 = 0.40$ ]. All of the scores were different from 0.5 [ $p < .05$ ].

The *B''<sub>D</sub>*<sup>2</sup> index is a measurement of type of decision-making criteria adopted by participants. *B''<sub>D</sub>* scores nearing -1 indicate a lenient response criterion and a tendency to more readily accept the information, while *B''<sub>D</sub>* scores closer to +1 show a stringent criterion and a tendency to reject the information. Participants with false information applied a more lenient criterion ( $M = -0.32$ ) than the non-misinformation participants ( $M = 0.15$ ) [ $F(1, 53) = 20.20$ ;  $p < .001$ ;  $\eta^2 = 0.28$ ], and there was a more lenient criterion for peripheral ( $M = -0.22$ ) than for central information ( $M = 0.05$ ) [ $F(1, 53) = 8.84$ ;  $p = .004$ ;  $\eta^2 = 0.14$ ]. The *B''<sub>D</sub>* scores with false information and for peripheral information

were different from zero [ $p < .05$ ], but this was not the case for the non-misinformation group and for central information.

*Confidence*

Two 2 (Misinformation: with, without) x 2 (Type of information: central, peripheral) ANOVAs were performed on the confidence for hits and false alarms. We did not use a single ANOVA with score (hits, false alarms) as a variable because few participants gave responses in all of the categories, thus making the analysis nonviable. The scores are shown in Table 2. Analysis of the hits showed no differences between the misinformation ( $M = 3.66$ ) and non-misinformation groups ( $M = 3.65$ ) [ $p > .90$ ], but confidence was greater for central ( $M = 3.87$ ) than for peripheral information ( $M = 3.27$ ) [ $F(1, 43) = 13.52$ ;  $p < .001$ ;  $\eta^2 = 0.24$ ]. Analysis of the false alarms revealed a higher level of confidence with misinformation ( $M = 3.66$ ) than without ( $M = 2.29$ ) [ $F(1, 39) = 49.95$ ;  $p < .001$ ;  $\eta^2 = 0.53$ ]. Although it was not statistically significant, there was a tendency towards higher confidence for peripheral ( $M = 3.16$ ) than for central information ( $M = 2.80$ ) [ $F(1, 39) = 3.75$ ;  $p = .060$ ;  $\eta^2 = 0.09$ ]. The interaction was not significant for either of the two analyses.

Table 2

*Confidence in hits and false alarms as a function of Misinformation and Type of information (range 1-5)*

	With misinformation		Without misinformation	
	Central	Peripheral	Central	Peripheral
Hits ( $n = 45$ )	4.07	3.33	3.67	3.20
False alarms ( $n = 41$ )	3.50	3.83	2.09	2.49

<sup>1</sup> *A'* (Snodgrass and Corwin, 1988) is calculated from a correction of the raw score of hits (H) and false alarms (FA).

$$\text{Probability of } H \text{ } ph = \frac{h + 0.5}{n + 1} \quad (1)$$

$$\text{Probability of } FA \text{ } pfa = \frac{fa + 0.5}{n + 1} \quad (2)$$

where  $n$  is the theoretical maximum of  $H$  or  $FA$ , respectively.

$$\text{For } H > FA \quad A' = 0.5 + \frac{(ph - pfa)(1 + ph - pfa)}{4 ph (1 - pfa)} \quad (3)$$

$$\text{For } FA > H \quad A' = 0.5 + \frac{(pfa - ph)(1 + pfa - ph)}{4 pfa (1 - ph)} \quad (4)$$

and if  $H = FA$ ,  $A' = 0.5$ . *A'* is calculated for each subject and averaged per condition.

<sup>2</sup> The formula of *B''<sub>D</sub>* (Donaldson, 1992) uses the same  $ph$  and  $pfa$  as *A'*.

$$B''_D = \frac{(1 - ph)(1 - pfa) - (phpfa)}{(1 - ph)(1 - pfa) + (phpfa)} \quad (5)$$

*B''<sub>D</sub>* is calculated for each subject and averaged per condition.

## Discussion

An eyewitness's memory should primarily include information that is important from a legal standpoint (central), but secondary or seemingly irrelevant contents (peripheral) may also be of relevance. Similarly, a witness's confidence in his memory is also important from a legal perspective. In this study we found two important results that help us understand the effect of misinformation on the memory of realistic events. First, presenting false peripheral information does not appear to have a greater effect than presenting false central information, even though the false alarm rate is higher for the latter. And second, when false central information is incorporated into our memories, it can later be expressed with high confidence.

After viewing a video of a bank robbery, the participants' performance was better for central than for peripheral information. This result was true for hits and false alarms. These results replicate the findings from earlier studies, both when misinformation is included in the procedure (Dalton & Daneman, 2006; Roebbers & Schneider, 2000; Sutherland & Hayne, 2001; Wright & Stroud, 1998) and when it is not (Christianson & Loftus, 1991; Ibabe & Sporer, 2004). This was also true for A' accuracy scores. As far as we know, no other studies so far have calculated the A' scores to study the memory of misinformation with central and peripheral contents. The better performance with central information may be due to deficits in our attentional system (Christianson, 1992a; Easterbrook, 1959). In complex situations with a certain amount of emotional stress, such as a bank robbery, our attention focuses on key elements which provide us with the most information, in other words, central as opposed to peripheral information (Christianson & Loftus, 1991; Migueles & García-Bajos, 1999). We focus more attention on these elements and process them better, thus improving our performance.

Exposure to post-event information can also impair the legal usefulness of a memory as it weakens performance by prompting the inclusion of external elements (Lindsay & Johnson, 1989; Loftus *et al.*, 1978). Congruently, participants produced more false alarms when they received false information than when not. According to Lindsay and Johnson (1989), this is apparently due to the fact that the participants with misinformation applied a more lenient response criterion than those without misinformation during the memory task, based primarily on familiarity. In other words, they had a greater tendency to answer *True* and to accept any item that had been presented previously.

However, Lindsay and Johnson's (1989) hypothesis was theoretical and there has been little direct empirical evidence to date to support it. Hekkanen and McEvoy (2002) conducted an experiment using the misinformation paradigm, calculating the criterion measure  $C$ , interpreted in the same way as  $B''_D$ . Based on the scores, they divided their participants into two groups, one with a stringent criterion ( $C > 0$ ) and the other with a lenient criterion ( $C \leq 0$ ). The

lenient group more readily accepted false information than the stringent criterion group. Our data also support the hypothesis that the misinformation group's more lenient criteria may have facilitated the acceptance of the post-event information. A more lenient criterion was attached to peripheral information than to central information. Peripheral information is less important and informative than central information and is therefore less processed. As a result, the participants had little control over whether a secondary item really appeared in the video or not, and since the false items were congruent with the situation, they preferred to answer *True* and accept them.

Another aspect we should point out is the high incidence of false alarms for peripheral information among the non-misinformation group. Half of the peripheral misinformation was accepted without prior exposure. When witnesses are called to testify at a trial any false information they may have been previously exposed to can alter their memory. But the mere fact of including peripheral misinformation congruent to an event in an attorney's question can cause it to become incorporated in a witness's memory and make him more likely to accept it as true. Although most questions and answers during a trial deal with central information, the effect of seemingly secondary information should not be underestimated. The amount of insignificant details unrelated to a crime can influence witness credibility and a jury's verdict (Bell & Loftus, 1988, 1989).

However, the fact that more errors are committed with peripheral information does not mean that post-event peripheral misinformation is more readily accepted. Participants accepted more peripheral than central misinformation, but it was accepted regardless of whether or not it had been previously presented. The prior presentation of central or peripheral misinformation did not affect the magnitude of the acceptance of either of the two types of misinformation, as seen by the lack of interaction between Misinformation and Type of information in the analysis of false alarms. Accordingly, post-event information does not have a greater effect on peripheral information than it does on central information.

Another important aspect is the degree of confidence witnesses have in their memory, since judges and jurors attach greater credibility to witnesses who appear confident (Krug, 2007; Wells *et al.*, 1979; Wise & Safer, 2004). If presenting misinformation increases confidence in false alarms, and central contents are normally evaluated with high confidence, then false alarms for central misinformation could be evaluated with high confidence. They would therefore be more credible and important in a legal sense than errors made in peripheral information. Analysis of the hits revealed higher confidence for central than for peripheral information, confirming previous studies (Migueles & García-Bajos, 1999). However, the false alarms showed a tendency towards the opposite pattern. Not only do participants create fewer false memories for central than for peripheral

information, but their false memories with central information seem less 'genuine' and, as a result, less credible.

Nevertheless, just because lower confidence is attached to false alarms for central information than for peripheral information, it does not mean that these errors are easy to detect and reject. The misinformation group expressed high confidence for false alarms for central information, while the non-misinformation group's confidence decreased considerably. Prior exposure to central misinformation not only increases the amount of errors but also affects the subjective experience, making memories more credible. In a trial, where the main focus of investigation revolves around central information, errors may be accompanied by a degree of certainty that could render them particularly damaging.

We should point out that in this study we used a memory recognition test, whereas in a legal context it is more common to work with testimonies acquired through memory tests such as the cognitive interview (Fisher & Geiselman, 1992). We opted for this type of test because it allows us to calculate several indicators derived from the Signal Detection Theory, which provide more information than we can extract from correct recall and intrusions. Moreover, the error rate for a recognition test is higher than for a free recall test (e.g. Sutherland & Hayne, 2001), which made it easier for us to examine the pattern of memory distortion.

In summary, misinformation could heavily impair our memory and affect the confidence in our memory. These effects should be taken into account when evaluating testimony in the courtroom to prevent possible contamination. Detecting the factors that contribute to memory distortion can be of great assistance in the legal context to minimize their impact.

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## APPENDIX

**Central and peripheral information used in the experiment  
and central-peripheral normative study scores (range 1-6)**

<b>True information</b>		<b>False information</b>	
<b>Central</b>		<b>Central</b>	
The robber <i>pulled out his gun before entering</i> the bank	5.13	The robber <i>shouted 'everyone get in the corner!'</i>	4.73
The robber <i>reassured the customers</i> that he wouldn't hurt them	5.27	The robber used <i>leather gloves</i>	4.93
The robber was carrying a <i>sawed-off shotgun</i>	5.27	The robber went inside and <i>closed the door</i>	5.00
The robber wore <i>beige work overalls</i>	4.60	The robber had a <i>gun</i> holstered to his belt	4.47
<b>Peripheral</b>		<b>Peripheral</b>	
<i>A couple crossed the street</i> at the crosswalk	1.53	There was a young man beside the door <i>withdrawing money</i>	2.00
The police officer <i>put on a glove</i>	2.47	The bank had a <i>coffee machine</i>	1.20
There was a <i>rope and post system to keep the bank queues orderly</i>	1.73	One of <i>the security guards shook hands</i> with the officer	2.07
The director was wearing a <i>tie</i>	1.67	There were <i>plants</i> next to the door of the bank	1.33