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CHAPTER 10

Context Reinstatement and Eyewitness Identification

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ABSTRACT

A meta-analysis, laboratory experiment, and a field study showed that context reinstatement improves eyewitness identification accuracy. The laboratory experiment also revealed that context reinstatement is most effective when memory for the to-be-identified person is impaired. Practical applications of these findings are discussed together with theoretical implications.

There is a considerable body of literature documenting the unreliability of eyewitness identifications (Brigham, Maas, Snyder, and Spaulding, 1982; Clifford and Bull, 1978; Loftus, 1979; Penrod, Loftus, and Winkler, 1982; Yarmey, 1979); however, few studies examine procedures designed to enhance the reliability of eyewitness identifications. In our own program of research we have been interested in two primary questions: What factors reliably and strongly affect identification accuracy and to what extent can the effects of these factors be moderated by procedures that reinstate the context surrounding an event?

VARIABLES THAT INFLUENCE EYEWITNESS IDENTIFICATION ACCURACY

We have addressed the question of which variables reliably affect identification accuracy from two perspectives. First, we have conducted a

meta-analysis of 128 separate facial identification and facial recognition experiments (Shapiro and Penrod, 1986), and second, we have conducted a factorial experiment to examine the main effects and interactive effects of thirteen separate variables on identification accuracy (Cutler, Penrod, and Martens, 1987a).

A meta-analysis

In examining the effects of independent variables on recognition and identification accuracy across experiments, Shapiro and Penrod (1986) computed *d* (a measure of effect-size indexing the number of standard deviations difference between the means of two experimental conditions) for both hits and false alarms, *d'* (a signal-detection measure of sensitivity), and *b"* (a signal-detection measure of criterion). Two examples can illustrate the meta-analytic findings. Among the variables shown to reliably and strongly affect facial recognition accuracy was transformation of the target's facial features. Transformations refer to either disguises or differences in facial characteristics from encoding to retrieval sessions, such as the addition or loss of a mustache, beard, or eyeglasses. The average effect-size for transformations was 1.05 on hits (manipulated across 19 conditions) and 0.40 on false alarms (manipulated across six conditions), both of which were significant. Signal detection measures further supported the contention that facial transformations affect recognition accuracy. For non-transformed faces, the average *d'* was 0.74, whereas for transformed faces, the average *d'* was only 0.32. This finding indicates that sensitivity declines with facial transformations. Facial transformations did not affect the decision criterion, however. Average *b'* was 0.06 for non-transformed faces and 0.09 for transformed faces.

The meta-analysis also showed that retention interval significantly affected recognition accuracy. Across all experiments included in the meta-analysis, the average retention interval was 108 hours. For purposes of analysis, the retention interval variable was dichotomized into short and long. The average effect-size of retention interval was 0.43 on hits (manipulated across 18 conditions) and 0.33 on false alarms (manipulated across 14 conditions), both of which were significant. Analysis of signal detection measures indicated that the long retention interval reduced sensitivity: the average *d'* was 0.47 for the short retention interval and 0.15 for the long retention interval. Retention interval also produced a small effect on criterion. Average *b"* was 0.14 for the short retention interval and 0.06 for the long retention interval, indicating the subjects more less likely to report recognizing a face in the long retention interval condition. In conclusion, the meta-analysis showed that facial transformations and retention interval both have appreciable effects on the accuracy with which people report recognizing faces.

A laboratory experiment

In order to substantiate the findings of the meta-analysis in a more applied setting, we conducted a fractional factorial experiment (Cutler *et al.*, 1987a). Fractional factorial designs (Cochran and Cox, 1957; Kenny, 1985) are those in which some main effects are perfectly confounded with higher-order interactions. In our experiment we confounded main effects with four- and five-way interactions. The benefit is that we can examine all main effects, two-way interactions, and some three-way interactions in a relatively condensed design with relatively few subjects. The cost is that we cannot assess four- and five-way interactions, as they are fully confounded with main effects. These four- and five-way interactions, however, are unlikely to be interpretable and are even less likely to replicate. Generally, a 2^{a+b} fractional factorial design refers to a design in which 'a' factors are fully crossed and 'b' factors are confounded with higher-order interactions between 'a' factors.

In the Cutler *et al.* (1987a) experiment subjects viewed a videotaped reenactment of an armed robbery and later attempted an identification from an offender-present or an offender-absent line-up parade. Characteristics of the videotaped robbery and of the line-up procedures were systematically varied. The variables manipulated included stimulus videotape (liquor store robbery vs armed mugging), disguise of the robber, weapon visibility, exposure time (30 vs 75 seconds), arousal level of robbery (high vs low), whether or not there was a distractor task during viewing, type of semantic elaboration (non-facial vs facial), whether or not subjects expected a line-up test, and the number of additional distractors appearing in the videotape (2 vs 5) all of which were expected to affect the witness' ability to encode information from the robbery. Variables that were expected to affect eyewitness memory by acting upon stored information were exposure to mugshots and retention interval (immediate vs one week). Finally, line-up instructions (biased vs unbiased), a variable associated with the retrieval of information, was expected to affect identification accuracy. The full design was a 2^{7+7} fractional factorial in which there were $2^7 = 128$ experimental cells that encompassed fourteen variables—seven of which were intentionally confounded with four- and five-way interactions. (One variable, whether or not subjects wrote down reasons that contradicted their decisions, was expected to affect only eyewitness confidence and is therefore not discussed here.)

Among the 165 subjects who participated, 43 percent correctly identified the robber from offender-present line-ups, and 32 percent correctly rejected

the offender-absent line-ups, thus yielding an average correct identification rate (proportion of hits + the proportion of correct rejections) of 0.36. The number of significant two-way interactions among the 13 variables examined (4 out of 78) was approximately what one might expect by chance alone at the 0.05 level of significance. We therefore discuss the analysis of main effects only. Given that line-up type (offender-present vs -absent) did not interact significantly with the other predictor variables, it was concluded that in this study all other independent variables influenced hit-rate and correct rejection-rate equivalently. All findings are therefore described in terms of correct identification-rate.

Weapon visibility had a significant influence on identification accuracy. Subjects who witnessed a robbery in which the robber outwardly brandished a handgun were less likely to correctly identify the robber from the line-up than were subjects who witnessed a robbery in which the handgun was hidden. It is presumed that the handgun draws the witness's attention and the characteristics of the robber are therefore less effectively encoded; consequently, performance on the line-up test is impaired. The average correct identification rate was 0.46 in the low weapon visibility condition but only 0.26 in the high weapon visibility condition (d = 0.52).

The instructions given to the subject-witnesses also significantly affected their subsequent abilities to identify the robber. Half of the subjects were given instructions that pressured them to choose a suspect from the line-up parade; these instructions did not explicitly offer the option of rejecting the line-up, although rejection of the line-up was an acceptable judgment. We refer to these instructions as 'biased instructions'. The remaining subjects were given 'neutral instructions', or instructions that explicitly offered the option of rejecting the line-up. The biased instructions significantly reduced identification accuracy. Among subjects given unbiased instructions, the correct identification rate was 0.48, but among subjects given biased instructions, that correct identification rate was only 0.24 (d = 0.62). This finding was not too surprising, as the effect of biased line-up conditions is perhaps one of the most reliable findings in experiments on eyewitness identification (Buckhout, Alper, Chern, Silverberg, and Slomovitz, 1974; Buckhout, Figueroa, and Hoff, 1975; Cutler, Penrod, and Martens, 1987b; Malpass and Devine, 1981a; Warnick and Sanders, 1980).

In support of the finding that facial transformations affected recognition accuracy in the meta-analysis, disguise of the robber also significantly influenced identification accuracy. In the high-disguise condition the robber wore a pull-over knit hat which covered most of his hair, and in the no-disguise condition, the robber wore no hat. Correct identification rate was 0.45 in the no-disguise condition but only 0.27 in the high-disguise condition. The effect-size for disguise (d) was 0.47, which is similar in magnitude to the effects of facial transformations on false alarms in the meta-analysis (0.40). In contrast to the meta-analysis, however, retention interval (immediate vs one week) did not affect identification accuracy in the predicted direction. In fact, the correct identification rate was significantly higher in the one-week condition (0.42) than in the immediate condition (0.30). Although such 'reminiscence effects' are unusual, they are not altogether uncommon (e.g. Deffenbacher, Carr, and Leu, 1981).

Although the issue of what variables reliably affect identification accuracy is far from settled (McCloskey and Egeth, 1983), the results of the experiment confirm that disguise, weapon visibility, and biased line-up instructions indeed influence identification accuracy, and the effects of these factors withstood qualification by (i.e. no interactions with) numerous other variables. Unfortunately, this research, along with many other eyewitness experiments, tells us little about how to improve the reliability of eyewitness identification; instead, it helps to identify and assess the magnitude of effects of variables that reduce identification accuracy. Nonetheless, it is obvious that one way to increase the reliability of eyewitness identification is to reduce the impact of factors such as disguise, weapon visibility, and retention interval on identification accuracy.

IMPROVING EYEWITNESS IDENTIFICATION ACCURACY THROUGH CONTEXT REINSTATEMENT

One plausible procedure for reducing the effects of variables such as retention interval and disguise is to provide subject-witnesses with contextual cues that might enhance their ability to recognize the target. In a later contribution to this volume Geiselman and his colleagues show that procedures that reinstate the context surrounding events improve recall of details of the event, and similar procedures may enhance recognition abilities, as well. In fact, the effects of context reinstatement procedures on facial recognition accuracy were examined in Shapiro and Penrod's (1986) meta-analysis. Context reinstatement procedures had an enormous effect on hits (d = 1.91 across the 23 conditions in which it was manipulated) and a moderate, though undesirable, effect on false alarms (d = -0.44 across the 18 conditions in which it was manipulated), both of which were significant. Overall, the average d' was 0.77 among subjects who received context reinstatement procedures but only 0.39 among subjects who did not receive context reinstatement procedures. It is clear that context reinstatement procedures reduced criterion (b'' was -0.06 among subjects who received context reinstatement procedures and 0.25 among subjects who did not receive context reinstatement procedures).

The effectiveness of contextual cues in enhancing recall and recognition depends largely on the cues that are already available to the subject. It is

unlikely that context cues produce unqualified main effects on improving memory (but see Krafka and Penrod, 1985; Malpass and Devine, 1981b). With recognition accuracy in particular, the stimulus itself provides a relatively strong context cue (in signal-present trials). We therefore predict in line with Smith's (this volume) reasoning, that contextual cues are most effective in enhancing identification accuracy in situations in which the target itself serves as a relatively ineffective contextual cue. Factors that reduce the witness's ability to encode characteristics of the target (e.g. disguise, weapon visibility), factors that affect the form in which the target's characteristics are stored in memory (e.g. retention interval), and factors that affect the retrieval of information about the target (e.g. line-up instructions) are all likely to influence the effectiveness of the target as a contextual cue. In general, we predict that providing subjects with additional context cues aids recognition accuracy in conditions such as high disguise, high weapon visibility, long retention interval, and biased line-up instructions, but does not affect identification accuracy when such degrading conditions are not present.

We have therefore embarked on a series of experiments in which we examine the interactions between contextual cues at the identification stage and other encoding, storage, and retrieval variables that have been shown to affect identification accuracy.

Before discussing our findings regarding the effects of context reinstatement, several points are worth noting. The first regards the choice of the context reinstatement procedures we employed. As noted elsewhere in this volume (see for instance, Smith's contribution) contextual cues can be quite diverse and can differ on a number of dimensions. Unfortunately, no type of context cue has been shown to be consistently superior to other types of context cues in improving recognition. Using aspects of the physical environment as context cues has shown mixed results in the laboratory with lexical stimuli (Fernandez and Glenberg, 1986; Smith, Glenberg, and Bjork, 1978; McSpadden, Schooler, and Loftus, Chapter 9, this volume) and has shown mixed results in facial recognition as well (Davies and Milne, 1985; Sanders, 1984). Some experiments have shown that environmental context cues improve facial recognition accuracy (Davies and Milne, 1985), while others show null results (Sanders, 1984). However, two experiments that reinstated both environmental and emotional context (i.e. emotions experienced during encoding), have both shown improvements due to context reinstatement (Krafka and Penrod, 1985; Malpass and Devine, 1981b).

Since one of our purposes is to develop techniques that can be used in a forensic setting, our choice of technique depends on the ease with which a technique can be incorporated into an existing set of procedures for interviewing witnesses, and of course, its effectiveness.

Police interrogators follow procedures that have been developed with an eye to cost-efficiency relationships. Interviewing techniques that are costly in terms of equipment and/or training and are of questionable effectiveness are likely to be ignored by the criminal justice system. The context reinstatement techniques we employ (some of which are adopted from the work of Geiselman and colleagues) are not costly and do not involve extensive training, they may therefore prove useful to the criminal justice system.

A laboratory experiment

An experiment was carried out (Cutler, *et al.* 1987b) to examine the effects of two types of context reinstatement procedures on identification accuracy. In this experiment 290 subjects viewed a videotaped robbery and later (after either 2 days or 14 days) attempted identifications from offender-absent or offender-present line-ups. One technique was implemented before the line-up phase and consisted of (1) mnemonic instructions, (2) exposure to a series of snapshots taken from the scene of the crime (snapshots which, of course, did not contain the robber), and (3) exposure to the witness's own written description of the events of the robbery and of the robber's physical characteristics. Subjects had given these descriptions immediately after viewing the videotaped robbery. In order to control for the completeness of descriptions across subjects, all subjects were asked (in questionnaire form) both open-ended and pointed questions regarding the events preceding the robbery, the robber–victim interaction, and the physical characteristics of the robber. The mnemonic instructions were modeled after Geiselman and Fisher's Cognitive Interview. Subjects were instructed to think back through the event from beginning to end, in different temporal orders, and were instructed to imagine witnessing the event from different perceptual perspectives, as well. Subjects were also instructed to reminisce about whether the robber's physical characteristics resembled those of people they knew, and to recall any thoughts and emotions experienced while witnessing the event. In this experiment these mnemonic instructions were given in writing in order to ensure comparability across the 64 experimental sessions in which context reinstatement procedures were used. The snapshots were various pictures of the inside of the liquor store in which the robbery was filmed. Besides showing the store there were some photographs of the clerk (the victim of the robbery) standing behind the counter where she stood during the robbery, and a snapshot of the handgun brandished by the robber. The three types of context cues, mnemonic instructions, exposure to description, and exposure to snapshots, were manipulated concurrently and we will henceforth refer to them as interview procedures.

The second context reinstatement procedure involved using the target's physical features as contextual cues. When studying the target's physical characteristics, subject-witnesses encode a host of information such as facial and other physical characteristics, posture, gait, voice quality, and the information encoded may be dependent upon the position from which they view the target (e.g. front or profile view). Subjects' abilities correctly to identify the target from a line-up parade may therefore depend on the particular information given to them during the recognition task. Posture, gait, and voice features may all be considered separate context cues and may improve identification accuracy. Some such cues may be qualitatively more effective than others, or perhaps the quantitative aspect of such cues is relevant. Half of the subjects attempted identifications from a line-up consisting only of slides of each suspect's head and shoulders from a front and full profile pose. The remaining subjects attempted identifications from line-ups which consisted of the slides of each suspect's head and shoulders and full bodies in front, three-quarter, and full profile views and in addition received voice samples and videotaped segments showing the suspects walking in and out of the room in which the line-up was held. Thus, we systematically exposed subjects to contextual cues such as posture (by showing the full body views), gait (by showing the videotaped segments of suspects walking), voice, skin color, and a three-quarter view.

In addition to manipulating the two types of contextual cues, interview procedures and line-up cues, retention interval, and the presence of the offender in the line-up, we also manipulated disguise, weapon visibility, the instructions given the witness before viewing the crime (facial vs non-facial elaboration) line-up size (6 vs 12 suspects), the degree to which the line-up members resembled the target in physical appearance (high similarity vs low similarity), and line-up instructions (biased vs unbiased). The full design was a 2^{7+3} fractional factorial.

Of the 290 subjects 64 percent correctly identified the robber from an offender-present line-up, and 29 percent correctly rejected the offender-absent line-ups. The relative absence of interactions between predictor variables and line-up type (offender-present vs -absent) except where noted indicated that hits and correct rejections were effected equivalently; therefore, we present most of the results in terms of correct identification rate (proportion of hits + proportion of correct rejections), as we did for the Cutler, *et al.* (1987a) experiment. The average correct identification rate was 0.46.

Main effects on identification accuracy were found for disguise and for line-up instructions. The average correct identification rate was 0.51 in the low-disguise condition and 0.40 in the high-disguise condition (d = 0.24). The average correct identification rate was 0.41 among subjects who received biased line-up instructions and 0.51 for subjects who received neutral line-up instructions (d = 0.22; $p < .10$).

A series of two-way interactions revealed that context cues were in fact moderating the effects of variables that affect identification accuracy. Disguise significantly impaired eyewitness performance among subjects who did not receive the context reinstatement interview. Among these subjects those who viewed the robber in disguise had a correct identification rate of only 0.29, and those who viewed a non-disguised robber had a correct identification rate of 0.57 (d = 0.62). The context reinstatement interview, however, brought the correct identification rate up to 0.51 among those who viewed the disguised robber. The correct identification rate for those who viewed the non-disguised robber and had the context reinstatement interview was 0.47 (d = 0.09). In other words, the only group whose performance suffered was the no context reinstatement interview, high-disguise group.

A similar pattern of results emerged in a marginally significant line-up instruction by context reinstatement interview interaction ($p \lambda 0.10$). Among subjects who received no context reinstatement interview biased line-up instructions significantly reduced identification accuracy. The mean correct identification rate was 0.54 for subjects who received neutral line-up instructions but only 0.32 for subjects who received biased line-up instructions (d = 0.49). However, among subjects who received the context reinstatement interview, correct identification rate did not suffer from the biased line-up instruction. The correct identification rate among this group was 0.50 for subjects who received neutral instructions and 0.48 for subjects who received biased line-up instructions (d = 0.04). The group that had the lowest correct identification rate was the no context reinstatement interview, high-bias group.

The context reinstatement interview by line-up instruction interaction is best understood in the context of choosing rates, or the proportion of times a suspect was chosen from a line-up. Among subjects who did not receive the context reinstatement interview, the choosing rates were 0.65 for subjects who received neutral line-up instructions and 0.99 for subjects in the biased line-up condition (d = 0.96). The corresponding choosing rates for subjects who received the context reinstatement interview were 0.71 for subjects given neutral instructions and 0.89 for subjects given biased instructions (d = 0.51). Context reinstatement significantly reduced the effect of biased line-up instructions on choosing rates.

Using additional physical characteristics as context cues within the line-up also produced a promising pattern of interactions with factors that affect identification accuracy. The added cues of voice features, three-quarter pose, full body view, and gait improved performance if line-ups contained a large number of suspects who resembled the robber in physical

appearance. Among subjects shown such line-ups, the correct identification rate was 0.36 for subjects not given the additional context cues but 0.54 among subjects given the added context cues (d = 0.40). Among subjects who were shown line-ups that contained few suspects who resembled the robber in physical appearance, the additional context cues provided in the line-up had a non-significant effect on correct identification rate. The correct identification rate was 0.50 for subjects who received no additional context cues and 0.44 for subjects who received additional context cues (d = 0.13). This interaction shows that when line-ups contained suspects who resembled the robber in physical appearance, which any 'fair' line-up should, the context cues provided by voice, gait, three-quarter, and full body views were helpful in discriminating among targets and foils.

The above interaction is perhaps better understood if considered along with a significant interaction between line-up cues and similarity of line-up members in predicting choosing rates. When additional context cues were not given in the line-up, the choosing rate was 0.72 in low similarity line-ups but 0.89 in high similarity line-ups (d = 0.48). Without the additional context cues, increasing the number of line-up suspects who resemble the target in physical appearance increased the likelihood that a line-up suspect was chosen. When the additional cues were given, however, increasing the number of similar looking suspects led to a significant shift in criterion in the opposite direction; the corresponding choosing rates were 0.88 and 0.76, respectively (d = 0.34).

The additional context cues in the line-up parade also improved the identification rate in the two-week retention interval condition. Among the subjects who attempted identifications after two weeks, the correct identification rate was 0.37 among subjects who did not receive the additional context cues in the line-up, but 0.59 among subjects who received the additional context cues (d = 0.49). Among subjects who attempted identifications after only two days, the additional context cues provided in the line-up had a non-significant effect on identification rate. The correct identification rate for these subjects was 0.49 among subjects who did not receive additional context cues and 0.39 for subjects who received additional context cues (d = 0.22). It should be noted that although subjects in the two-week condition who received additional context cues in the line-up had higher correct identification rates than subjects in the two-day condition, the increase in correct identification rate from 0.49 (two-day, no additional context cue condition) to 0.59 (two-week, additonal context cue condition) was non-significant, even using the most lax criterion (simple comparison using Fisher's LSD test). This difference in performance is probably attributable to chance variation.

Finally, there was a significant interaction between contextual cues in the line-up parade and exposure to mugshots. Among subjects who were not shown mugshots, the added context cues in the line-up significantly improved identification accuracy. Among this group the correct identification rate was 0.35 among the subjects who did not receive additional cues but 0.51 among subjects who did receive additional cues (d = 0.35). The corresponding correct identification rates for subjects who searched mugshots were 0.51 and 0.47, respectively (d = 0.09).

In conclusion, the context reinstatement interview effectively offset the effects of disguise and biased line-up instructions on identification accuracy. The interaction between line-up instructions and the context reinstatement interview in the prediction of identification accuracy and choosing is particularly interesting. Unlike disguise, biased line-up instructions do not affect the encoding of information, but increase the pressure to choose a suspect from the line-up. It has been predicted that the effects of social pressure on judgements of perception increase as ambiguity of the object about which the judgment is being made increases (Asch, 1951). If the context reinstatement interview serves to improve the vividness of the witness' image of the target, then one might expect the effects of biased line-up instructions to be alleviated by the reinstatement of context. Our results support this conjecture. Further research will be needed (and is presently being conducted) to unconfound the effects of the three procedures that comprised this interview, mnemonic instructions, exposure to snapshots showing the environment in which the crime occurred, and exposure to the subject's own description of the robber's physical characteristics and of the environment.

Using additional context cues in constructing the line-up increased the reliability of identifications in the two-week retention interval condition and in the high-similarity line-up condition. Exposure to mugshots during the interim between witnessing the event and viewing the line-up reduced the effectiveness of the line-up contextual cues.

Until now we have only described the effects of context reinstatement procedures obtained in our laboratory and in the meta-analysis. It is therefore appropriate to inquire about the effects of context reinstatement procedures in more naturalistic settings. Experiments that involved staged incidents, for example, have shown positive effects for context reinstatement (Malpass and Devine, 1981b; Timm, 1981; Wagstaff, 1982), but such optimistic results are not universally obtained (Lindsay and Wallbridge, 1983).

A field experiment

Krafka and Penrod (1985) examined the effects of context reinstatement procedures on identification accuracy in an applied, forensically-relevant context. The settings of the experiment were liquor stores, convenience

stores, and small neighborhood groceries throughout Madison, Wisconsin and the surrounding area. The procedures of the experiment were as follows. An experimental 'confederate' entered a store and purchased a small item with a travellers' check. Either 2 or 24 hours later, an experimenter, posing as a law intern, entered the store and asked the clerk with whom the first target confederate interacted to identify the target from a six-person, target-present or target-absent photospread. The context reinstatement procedures, which half of the subjects received, consisted of (1) instructions to recall what occurred during the transaction and mentally to reconstruct the target's face, (2) exposure to a photocopied form of identification (non-photo) displayed by the target during the transaction, and (3) exposure to another travellers' check signed by the target. In all, 85 clerks participated in the experiment. Data from target-present and target-absent photospreads were analyzed separately.

In data from the target-present line-up condition the overall hit rate was 0.41. Among the subjects who received context reinstatement procedures, the hit rate was 0.55, but among subjects who received no context reinstatement procedures, the hit rate was only 0.29; this difference was significant (d = 0.36). No significant differences in hit rate were attributable to retention interval or to the interaction between context reinstatement procedures and retention interval. Analysis of data from the target-absent arrays showed that context reinstatement procedures did not affect the false identification rate.

IMPLICATIONS FOR FORENSIC APPLICATION AND FURTHER RESEARCH

The fallibility of eyewitness identification presents the legal system with a perplexing problem. The courts must devise appropriate criteria for evaluating the reliability of identifications given specific circumstances and intuition alone is insufficient for developing these criteria (Wells and Murray, 1983). The legal system might profitably rely on the findings of social scientists to aid in determining appropriate criteria. The knowledge that social scientists gain from their experimentation may contribute not only to more informed decision-making on the part of factfinders, but perhaps to more effective factfinding on the part of the police. Our findings indicate positive effects on witness' abilities to correctly identify a perpetrator of a witnessed crime for procedures designed to reconstruct the context of a witnessed event. These findings complement those of Geiselman, who demonstrates that such procedures enhance the reliability of eyewitness recall.

We have discussed the results of studies that adopt a variety of methodologies including meta-analysis, laboratory experimentation, and

experimentation in the field. Taken together our results show that procedures that reinstate the context surrounding an event can effectively increase the reliability of eyewitness identification. Although the findings of the meta-analysis (Shapiro and Penrod, 1986) and those of Krafka and Penrod (1985) and of Malpass and Devine (1981b) show that context reinstatement procedures may have main effects on identification accuracy, it is also the case that the meta-analysis allows for assessment of few two-way interactions, and the Krafka and Penrod (1985) and Malpass and Devine (1981b) experiments manipulated few variables. Results of our fractional factorial experiments indicate that the effects of context reinstatement are likely to be qualified by interactions with other variables, which probably explains the generally inconsistent findings regarding the effects of context cues on recognition accuracy (e.g. McSpadden *et al.*, this volume). Further research is needed to clarify the roles of various forms of context cues in affecting identification or recognition accuracy. Adding characteristics such as voice features, gait, and posture proved useful when used in combination with one another. Mnemonic techniques, reinstatement of emotions experienced at encoding, and mental reinstatement of environmental cues were effective in the Krafka and Penrod (1985), Malpass and Devine (1981b), and Cutler *et al.* (1987b) experiments. Further research in this area will increase our knowledge about how and which context cues affect the memory system generally, and might assist in developing procedures that will increase the reliability of eyewitness identifications.

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CHAPTER 11

Improving Eyewitness Memory Through Mental Reinstatement of Context

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ABSTRACT

Research is described on the Cognitive Interview. This new procedu incorporates (i) mental reinstatement of context, (ii) exhaustive recall, (i perspective changes, (iv) repeated retrieval using different starting point all of which lend to improved recall under laboratory conditions. Studi involving both live and video incidents demonstrate the superiority of tl cognitive interview over conventional techniques as provided by experienc police personnel.

A critical component of effective law enforcement is the abilit police investigators to obtain accurate and detailed information witnesses (Rand Corp., 1975). Eyewitness testimony also can ha great impact on jury decisions in the courtroom (Loftus, 1974). Howe eyewitness accounts are known frequently to be fallible and incom (Loftus, 1979). Fortunately, we can devise tools to improve the qu of eyewitness reports.

In the typical crime scenario, the events unfold rapidly under emoti ly charged conditions. As a consequence, consciously controlled enco strategies are unlikely to be used. Practically, eyewitness memory ca enhanced only by developing mnemonics that improve the retriev search phase of memory. The focus of the research described here, t has been to develop mnemonics that can be used to facilitiate recolle at the time of retrieval.

One generally accepted principle of memory that is relevant to eyewitness situation is that a memory trace is composed of several feat (Bower, 1967; Underwood, 1969; Wickens, 1970) and the effectiveness