CAN A CONTEXTUAL MEMORY AID INCREASE THE ACCURACY OF EYEWITNESS IDENTIFICATION?

David R. Foster

Abstract:

The cognitive interview uses retrieval cues obtained from reinstatement of the context of an event to aid a witnesses' memory. This study focused on whether a piece of evidence from within the context of an event, the shirt worn by a suspect, could help activate retrieval cues and increase the accuracy of description and identification of that suspect by a witness. This research also sought to replicate findings on the advantages of sequential lineups over simultaneous lineups, and the confidence-accuracy correlation. The results of the study did not support the hypothesis that a contextual memory aid would increase the accuracy of identifications and descriptions of a suspect. A modest confidence accuracy relationship was found, but no useful information on lineup types was obtained. This research, in failing to be able to draw any conclusions about the role of contextual memory aids, points out ways in which the field of knowledge surrounding this technique can be advanced.

Introduction

In the last two decades research on improving eyewitness memory has developed and refined the cognitive interview. The cognitive interview is an interviewing technique which has been shown to increase the amount of detail recalled by a witness without increasing the amount of incorrect information remembered from an event (Finger & Pezdek, 1999). The cognitive interview involves asking a witness to remember an event from different perspectives, to run through the chronological sequence of the event in different orders, and to respond to a variety of open-ended questions. The theory behind the cognitive interview, according to Geiselman and Fisher (1989) is that by reinstating the context of an event more retrieval cues will be activated, giving the witness access to a more detailed and extensive memory of the event. Retrieval cues, as described by Tulving and Osler (1968) are small pieces of information which allow one to access a memory trace for an event. They essentially 'jog the memory', reminding us of information that we didn't know we knew.

If reinstating context is important to triggering retrieval cues, then there are many ways in which a police interviewer can increase a witnesses' memory. Returning the witness to the scene of the crime under similar conditions would immerse the witness in the original context. This could be costly and inefficient, as well as produce misleading information if the scene had been tampered with or changed. This approach requires leaving the relative safety and privacy of the police department which would further complicate the situation. Research by Fisher, Geiselman, &Amador (1989) has shown that hypnosis has been used in reinstating context, but requires having someone specially

trained in its usage. Research by Schacter (1996) has implicated hypnosis in producing greater susceptibility in witnesses to misleading questions, a condition which should be generally avoided.

Police and investigators often collect evidence from the scene of a crime, evidence which could be useful in triggering a witnesses' retrieval cues of the event. A search of the literature on using evidence to help reinstate context to increase witness memory uncovered a lack of research on this method.

Does presenting evidence left at the scene of a crime increase the accuracy of a witnesses' identification of a suspect? In this experiment, the evidence used was a shirt worn by one of the two suspects during their interaction with the witnesses. The crime in this study never actually occurred, instead the participants interacted with the witnesses in such a way as to remember them for the later identification task. Two confederates were used, alternating between sessions with one wearing the shirt, which would be later presented to aid in his identification, and the other confederate existing as a control who would be identified without the memory aid. It was predicted that witnesses who saw the shirt worn by one of the suspects would have their memory trace of that suspect activated and be able to provide a better description and a more accurate identification of that suspect than the suspect for whom no cues were presented.

The way photographs in a line-up are presented to a witness can influence the likelihood of a correct identification of a suspect (Wells, 1993). Simultaneous line-ups include a number of photographs, usually six, presented at the same time either in a line or in a 2x3 array (Lindsay & Bellinger, 1999). Research by Wells (1984) suggested that witnesses tended to use a relative rather than absolute strategy when using a simultaneous line-up to make an identification. They tend to select the photograph that most resembled their memory of the criminal, even if the criminal wasn't actually in the photo array (Wells, 1993). This resulted in the frequent selection of a similar but incorrect suspect. Sequential line-ups present one photograph at a time and ask the witness to make a judgment as to whether the photograph is of the perpetrator or not before going on to the next photograph. Research done by Lindsay and Bellinger (1999) found that witnesses make a more absolute judgment of photos when they are presented sequentially, lowering the rate of false-positive choices. This method did not lower the rate of correct identifications, making it preferable to the simultaneous presentation style. Using a different paradigm than the Lindsay and Bellinger study, this study sought to replicate the finding that sequential lineups would reduce the number of false-positive identifications while not differing significantly in the number of correct identifications from simultaneous lineups

Research by Egeth (1993) and Wells and Seelau (1995) and Philips et al. (1999) on increasing the efficiency of line-up procedures has found four techniques which decrease the error involved in the identification process. These techniques were used in this study to ensure that confounding variables didn't taint the interviewing process.

- The experimenter was blind to which photo was being presented during the sequential photospread indentification task. Due to constraints, this was not the case during simultaneous lineups.
- Participants were told that the suspect may or may not be in the set of pictures.
- The foils were chosen so that many closely resembled the suspects, and at least three in every six photo lineup were similar to the suspect in appearance.

•After the participants had made an identification, their selection was immediately recorded, and their level of confidence in their choice was determined and recorded.

The relationship between confidence and accuracy has always been a problem for jurors, as it is commonly believed that a confident juror is an accurate juror (Wells, 1993; Wells & Bradfield, 1998; Olsson & Juslin, 1999). A meta-analysis by Sporer, Penrod, Read and Cutler suggests, contrary to popular opinion, that there is only a weak relationship between confidence and accuracy. Occasionally a study will find a significant relationship (r=50) between confidence and accuracy and the debate will continue (Brigham et al, 1982). This study was designed to also test the confidence-accuracy relationship, though the results found were in no way the final word on the issue.

The primary purpose of this research was to test the effect of a contextual memory aid on a witnesses memory of a suspect. Secondary analyses attempted to replicate the finding that sequential relationships are superior to simultaneous in reducing false positives. The relationship between confidence and accuracy was also tested by this study.

Method

Participants

Participants were 33 Introduction to Psychology students from a liberal arts University in central New York who received one hour of credit towards the course's laboratory requirement. Participants were 18 female and 15 male students, ranging in class year from first-years to seniors. Participants who knew or were known by the confederates were excluded from the analysis. One participants' data were completely excluded due to a late arrival and two students who knew one of the confederates had their data for that confederate ignored.

Materials

Contextual Memory Aid. A shirt worn by one of the confederates was used as the contextual memory aid in this experiment. The shirt was a red and white Arsenal soccer jersey, which while not being entirely out of place, stood out enough to be remembered. The confederates alternated wearing the shirt for the different experimental sessions. The shirt would then be later shown to the participant before they were asked to identify the confederate who had worn it. As a control, the confederate not wearing the shirt was asked to be identified without any connection to the context of the initial session.

Photograph Array Cards. 36 black and white 1.5x2 inch head and shoulder photographs, taken from a fraternity composite, were mounted on 3x4 inch index cards for the suspect photograph identification task. The first 18 cards were used for the first confederate (Suspect Co), the second 18 for the second confederate (Suspect Ca). Each group of 18 cards was organized into three sets of six cards each, with the at least two foils in each group that resembled the confederate.

Suspect Identification Questionnaire. A four page questionnaire was used to assess participants memory of each confederate. The first page asked participants to write as much as they could remember about the confederate. The latter three pages asked specific questions about the confederate's height, hair color and length, eye color, and dress. The questionnaire also assessed the level of participant's confidence in the accuracy of their memory of these features.

Filler Activities. Three questionnaires were used to fill time while participants were in the presence of the confederates during the initial session. The first two questionnaires measured participant's opinions about the social, academic and residential life at the University. The third questionnaire asked participants to rank different adjectives as accurately or inaccurately describing their personalities. This questionnaire was developed by Goldberg (1992), and was scored in such a way as to measure extroversion, neuroticism, openness, agreeableness and conscientiousness.

The results of these questionnaires will be presented in a later paper concerning the nature of social, academic and residential life at the university. Thirty-five complete sets of questionnaires for this part of the study were completed.

Design and Procedure

Participants met in groups of five or six along with two confederates who were posing as students in the study. The confederates were two white male students, age 21 (Suspect Ca) and 22 (Suspect Co), who were instructed to behave in a certain way during the course of the experiment. The group, participants and confederates and experimenter sat in a circle, with one confederate to the right and one to the left of the experimenter. All participants could directly see the faces of the confederates at all times during the study. The participants and confederates pretending to be participants filled out consent forms and were told that the study was about personality and life at the University. They then filled out two questionnaires pertaining to social, academic and residential life at the University, as well as a personality scale which measured the Big Five (Goldberg, 1992). While participants were filling out questionnaires, the experimenter would leave the room for a short time, allowing the confederates to interrupt the session and ask questions about television programming that evening. During the course of the session, the confederates would alternate between asking to borrow pens, collecting and distributing the questionnaires, and other activities to call attention to themselves. Upon completion of the three questionnaires, participants set up a time to return, a week later, to finish the second half of the study.

Participants met individually with the experimenter a week after the initial session. At this time the true nature of the experiment was revealed, that the participants were to be asked to identify the two confederates, and pick them out of a photo array. Participants were randomly divided into two groups, one group identifying the confederate with the shirt first, and the second group identifying the confederate without the shirt first. This controlled for the effects upon memory of identifying a confederate before the other.

Participants would be shown the context memory aid when they were identifying the suspect who had worn it originally, and then be asked to fill out a suspect identification questionnaire asking about the appearance of the confederate. Upon

completion of this task, the participant was shown either a simultaneous lineup, or a sequential lineup, and told that the confederate may or may not be in any of the photographs. The sequential lineup consisted of 18 photographs and the participants made a decision about each one before seeing the next. The simultaneous lineup consisted of three separate six photograph arrays, presented one at a time. If the participant didn't believe the suspect was in the first array they were shown the second, and then third. Both sets used suspect-present arrays.

Upon identifying or failing to identify the first confederate, the photograph chosen was recorded, as well as a measure of the participants' confidence in their selection. The second confederate would then be asked about, using the identification questionnaire and the same type of lineup as during the first identification. The confidence and identification choice for the second confederate were recorded after, and then the participant was shown which photographs were actually the confederates. Participants then read and signed a debriefing form, and received an hour of credit for their participation.

Results

The primary analysis consisted of a multivariate analysis of variance (MANOVA) to determine the effect of the contextual memory aid on two dependent measures for each suspect, Accuracy of Witness Descriptions of a suspect and Correct Suspect Identification from the photo array. The Accuracy of Witness Description was measured on a scale from 1 to 100 by combining results of a questionnaire asking witnesses to describe from memory different aspects of the suspect in question. Correct Suspect Identification was scored as either a 1 for correct identification or a 0 for an incorrect identification of the suspect in question. The design of the experiment was a 2 (Witness Gender) x 2 (Suspect with Memory Aid) x 2 (Accuracy of Witness Description) x 2 (Correct Suspect Identification). Accuracy of Witness Description and Correct Suspect Identification were repeated-measures variables, in which scores for each participant were compared for both suspects. A Suspect with Memory Aid by Accuracy of Witness Description interaction and a Suspect with Memory Aid by Correct Suspect Interaction were both predicted. An interaction in these cases would mean that when the contextual memory and was used in identifying a suspect, ratings should be higher for that suspect and lower for the other suspect.

Contrary to predictions, the MANOVA did not find a significant relationship between the use of the memory aid and increased identification of the suspects ($F<1$). A further analysis for each suspect found that for Suspect Ca, the memory aid did increase identifications significantly ($F=2.484$, $p=.035$), witnesses viewing the memory aid identified Suspect Ca more frequently ($x=.750$) than when not viewing the memory aid ($x=.458$). This finding was not significant for Suspect Co ($F<1$), and the overall effect across both suspects was not significant.

The MANOVA did not find a significant effect for Suspect with Memory Aid on Accuracy of Witness Description ($F<1$). Further analysis of this finding for each suspect found that for Suspect Co, there was no effect for Suspect with Memory Aid ($F<1$). For Suspect Ca, there was an effect for Suspect with Memory Aid ($F(1,33)=6.331$, $p=.020$). Participants identifying Suspect Ca when viewing the contextual memory aid had a

description that was more accurate and complete (x=42.708) than when they did not see the memory aid (x=31.875). This effect was not significant across both suspects however.

There was no significant effect for Witness Gender ($F<1$). A further analysis for each suspect found ($F=5.395$, $p=.030$) that males had a more accurate description of Suspect Ca (x=42.708) than females did for Suspect Ca (x=31.875). This effect was not found for Suspect Co, and was not significant across both suspects.

A positive correlation was found between ratings of identification confidence and identification accuracy for both confederates (Suspect Ca: $r=.548$, $p<.01$, one-tailed, Suspect Co: $r=.589$, $p<.01$, one-tailed).

After the data had been collected, it was found that the way that identifications from simultaneous versus sequential lineups were coded made it impossible to perform a test to determine the number of false positives. Suspects were identified 47% of the time when witnesses saw a sequential lineup, and 43% of the time when suspects viewed a simultaneous lineup. This different was not significant, supporting the finding that simultaneous and sequential lineups produce an equal amount of correct identifications.

Discussion

The statistical data did not support the hypothesis that a contextual memory aid increases the accuracy of a witnesses' description and identification of a suspect. The hypothesis was supported for suspect CA, but not for suspect CO. This leads me to believe that this research was on the right track, and confounding variables were responsible for the overall non-significant outcome.

The data supported the previous finding that sequential and simultaneous line-ups result in the same number of correct identifications. The data could not be used to analyze the frequency of false positives, and this information is what has been shown to make the sequential lineup procedure superior to the simultaneous lineup procedure. A revised version of this study could address this problem correctly, and hopefully replicate the finding supporting the use of sequential lineups. This information is useful to police and investigators as they often use simultaneous photograph arrays or lineups, when a sequential approach would result in fewer innocents being wrongly accused.

This study found a relatively strong relationship between witnesses' confidence in their identification of the suspects and the accuracy of their identifications. This finding, far from being the final word on the confidence-accuracy debate, shows that at the very least more research on the way in which the relationship between confidence and accuracy plays out in different situations needs to be done.

The contrived nature of the experiment, despite the fact that participants didn't know about its true nature until after they had been exposed to the confederates, effects the external validity of this research. The use of university students as witnesses and then the use of other university students as suspects renders the findings of this research largely devoid of applicability to a real-world setting. Yuille (1993) has made the point that in research studying how witnesses behave, it would be best to use actual witnesses from crimes or trials, as opposed to a subject group which differ substantially from the population at large.

Not all crimes involve a violent or even a noteworthy event. The experiment is not as unnatural as it sounds though, as not all witnesses actually view a crime taking place, they may have left a bank as the robber was coming in, or interacted with a burglar in a friendly manner as he was looking for a house to rob. The confederates in this study followed a script of what to say and do, and this script was constructed in such a way as to call attention to them without making them stand out from the rest of the group too much. Future research, or a revision of this study should use a pool of more than two suspects, as the individual differences in the suspects made it difficult to determine the true effect of the contextual memory aid.

About 75% of the participants performed the identification task in the same room as the initial session was in, but a few had to be relocated to another room. This would have confounded the results by introducing the effect that the room had upon recall since it was not controlled for across all participants.

Further research into this idea should include a more mixed participant pool, both in age and race. The confederates should also vary in race and age, thereby increasing the external validity of the research. Research should also vary what types of contextual memory aids are used, they could consist of other articles of clothing, things carried by the suspects, or actual items from the scene. Research should be done as to what types of evidence investigators usually obtain from the scene of a crime, and whether that evidence could be shown to witnesses to trigger retrieval cues at the time of their interviews.

The role of reinstating context to trigger retrieval cues to increase a witnesses' memory needs to be investigated further. Evidence obtained at the scene of a crime would make an inexpensive and quick way to provide the witness with some of the context of the original event. Research done on ways to better witness memory will have always play a large role in the process, eyewitness identification and testimony will likely remain a major part of any case against a suspect.

References

Baddeley, A. D. (1999). Essentials of Human Memory. East Sussex: Psychology Press, Ltd.

Brigham, J. C., Maass, A., Snyder, L. D., & Spaulding, K. (1982). Accuracy of eyewitness identifications in field settings. Journal of Personality and Social Psychology. 42, 673-681.

Egeth, H. E, (1993). What do we not know about eyewitness identification. American Psychologist, 48, 577-580.

Finger, K. & Pezdek, K. (1999). The effect of the cognitive interview on face indentification accuracy: release from verbal overshadowing. Journal of Applied Psychology, 84, 340-348.

Fischer, R. P., Geiselman, R. E. & Amador, M. (1989). Field test of the cognitive interview technique: Enhancing the recollection of actual victims and witnesses to crimes. Journal of Applied Psychology, 74, 722-727.

Geiselman, R. E., & Fisher, R. P. (1989). The cognitive interview technique for victims and witnesses of crime. In D. C. Raskin (Ed.), Psychological methods in criminal investigation and evidence (pp. 191-215). New York: Springer.

Goldberg, L. R. (1992). The development of markers for the big-five factor structure. Psychological Assesment, 4, 26-42.

Horowitz, I. A., Willging, T. E. & Bordens, K. S. (1998). Psychology and Law. Second edition. New York: Addison-Weslet Educational Publishers Inc.

Lindsay, R. C. L. & Bellinger, K. (1999). Alternatives to the sequential lineup: the importance of controlling the pictures. Journal of Applied Psychology, 84, 315-321.

Olson, N. & Juslin, P. (1999). Can self-reported encoding strategy and recognition skill be diagnostic of performance in eyewitness identifications? Journal of Applied Psychology, 84, 42-49.

Phillips, M. R., McAuliff, B. D., Kovera, M. B. & Cutler, B. L. (1999). Double-blind photoarray administration as a safeguard against administrator bias. Journal of Applied Psychology, 84, 940-951.

Schacter, D. (1996). Searching for memory. New York: Basic Books.

Tulving, E. & Osler, S. (1968). Effectiveness of retrieval cues in memory for words. Journal of Experimental Psychology, 77, 593-601.

Wells, G. L. (1993). What do we know about eyewitness identification? American Psychologist, 48, 553-571.

Wells, G. L., & Bradfield, A. L. (1998). "Good you identified the suspect": Feedback to eyewitnesses distorts their reports of the witnessing experience. Journal of Applied Psychology. 83, 360-376.

Wells, G. L. & Seelau, E. P. (1995). Eyewitness identification: Psychological research and legal policy on lineups. Psychology, Law & Public Policy, 1(4), 765-791.

Yuille, J. C. (1993). We must study forensic eyewitnesses to know about them. American Psychologist, 48, 572-573.