

How the Wording of a Question
and Credibility Influence
Accuracy of Memory Recall
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Credibility Influence the Accuracy of Memory Recall

At some point in every person's life one is going to be asked to specifically recall the details of some previous event, such as an automobile accident. Accuracy in memory requires recall of specific details. Research has shown that memory is very susceptible to external influences such as post-event information (Loftus & Palmer, 1974; Cole & Loftus, 1979; Loftus & Zanni, 1975; Pirolli & Mitterer, 1984). Often post-event information is derived from the wording of questions that is being asked. A question can contain information that is consistent or inconsistent with the events that actually occurred.

Relatedly, the perceived qualities of the person asking the questions can also have an effect on the accuracy of memory recall; for example their perceived credibility (Smith & Ellsworth, 1987; Gundersen, 1987). If the questioner is seen as highly credible, then he/she may be more influential when giving misleading information than a questioner who is

perceived as having little credibility.

Definitions

Leading Questions. Loftus and Palmer (1974) defined a leading question as one that "either by form or content, suggests to the witness what answer is desired or leads him to the desired answer" (p. 585). Essentially a leading question implies an answer to the question being asked. Leading questions can be divided into two categories: (a) those that are consistent with the actual events and, (b) those that are inconsistent (misleading) with the actual events.

Credibility. Over the years researchers have given many definitions for the word "credibility". Early research equated credibility with expertness and trustworthiness (Hovland, Janis and Kelly, 1953). Later research modified this conceptualization by including competency, character, sociability, composure and extraversion (McCroskey and Jenson, 1975). In addition to these two definitions credibility has also been defined as the attractiveness of the source of influence, the prestige of the source and the previous

accuracy of the source (Nesler, Aguinis, Quigley & Tedeschi, 1993). These alternative modes of conceptualization have resulted in varied operational definitions of credibility in empirical research.

Consistent and Inconsistent Questions

Loftus and Palmer (1974) illustrated how the wording of a question can have a dramatic influence on memory recall. In their first study, 45 subjects viewed seven short films of automobile accidents. After viewing the films subjects gave a written documentary of the filmed events and then answered a series of specific questions about the films. The critical question pertained to the estimated speed the vehicles were travelling at the time of the accident. This question was manipulated using five distinct words ("smashed", "collided", "bumped", "hit", and "contacted") each of which was hypothesized to give the impression of an estimated speed. The results clearly illustrated that simply by manipulating one word in a sentence one can elicit significantly different estimates of speed. For example, when the word

"smashed" was used subjects gave an average estimated speed of 40.8 mph whereas the word "contacted" resulted in an average speed on only 31.8 mph.

Wanting to replicate the results from the first study Loftus and Palmer (1974) conducted a second experiment in much the same way. However, in the second experiment there were more subjects (N=150) and only two words were used in reference to perceived speed of the vehicles when the accident occurred. Fifty of the subjects received the critical question using "smashed", another 50 using "hit" and the remaining subjects were controls in that there was no reference to perceived speed. In a follow-up session one week later subjects were asked if they had seen any broken glass in the film. Analysis revealed that 32% of the subjects asked the "smashed" question reported that they had seen broken glass, whereas only 14% of the subjects asked the same question using "hit" reported that they had seen the broken glass (Note: there was no broken glass in the actual accident). From these two experiments one can see that the wording

of a question can dramatically influence memory of an event in such a manner that we report the presence of things that were not present at the actual event.

Relatedly, Cole and Loftus (1979) presented a series of 62 slides (32 later to be used in testing) to 48 subjects. Upon viewing the slides each subject was given 24 cards containing eight consistent questions, eight inconsistent questions and eight uninformative questions about the 32 test slides. The subject was asked whether or not a specific object had been present in the slide and then to respond on a 6-point scale about how confident they were in their answer.

The results of this experiment indicated that questions containing consistent information increased accuracy in recall while inconsistent questions reduced accuracy. The essential point illustrated here is that when cued that an object was present in the slide (consistent question), subjects are inclined to respond in the affirmative. In contrast, when one implies that something was present, that was actually not present (inconsistent question), the subject is more likely to

respond that they did indeed see the object in the slide.

In addition to verb forms conveying implied messages to the witness about how the event in question is to be reconstructed, the subtle use of definite and indefinite forms can convey implicit expectations. For example a question such as "Did you see 'the' weapon?" versus "Did you see 'a' weapon?", the first sentence using a definite article, while the second sentence contains an indefinite article. Loftus and Zanni (1975) showed 100 subjects a film of a multiple vehicle accident. The film was followed by a questionnaire in which the subjects were required to give a narrative account of the accident and then answer 22 questions (6 critical) about the film. Half of the subjects received critical questions using "the" and the remainder of the subjects received critical questions using "a". In addition three of the critical questions were consistent with the events in the film and three were inconsistent. The questionnaire allowed for three possible answers: yes, no and I don't know.

The results indicated that the subjects who received the indefinite article ("a") were less certain (I don't know) in their response compared to the subjects who received the same question using a definite article ("the"). The use of a definite article "the" produced greater certainty in the subjects response. It was also found that the inconsistent questions that incorporated a definite article in the question produced an error rate twice as large as the same question using an indefinite article.

Loftus and Zanni (1975) replicated these findings in a second study. Taken together, the findings suggest that the accuracy of recall is deleteriously affected by the use of definite articles. Definite articles, when used in a question, imply the presence of an object; if the question is inconsistent with the actual events, there is a much higher error rate than consequently, the subject has significantly less accurate memory recall.

The findings made by Loftus and Palmer (1974), Cole and Loftus (1979), and Loftus and Zanni (1975)

have been replicated repeatedly in other laboratories (eg. Pirolli & Mitterer, 1989). These findings suggest that: (a) the wording of a question (including definite and indefinite articles) can have an effect on the accuracy of memory recall, and (b) consistent and inconsistent questions can improve or impede memory recall. Hence, to elicit the most accurate response from a witness one must carefully monitor how the questions are being asked or else face the probability of inaccurate memory recall.

Incorporating New Information into Memory

There have been two issues heavily debated concerning the impact of misleading suggestions on memory recall. The first issue deals with whether the misleading or inconsistent information impairs the ability of the witness to remember the details of the event. Relatedly, the second issue focuses on the subject's belief in whether or not he/she actually saw the inconsistent suggested details (Lindsay, 1990).

The memory impairment described above has been linked to the process of overwriting and/or retroactive

interference. Loftus (1975) suggested that the new inconsistent (i.e., misleading) suggestion updates the witnesses' previous memory for the event in question. When a memory is updated by suggestion the previous memory for the event is overwritten and subsequently destroyed. This would explain why the witness can easily recall the misleading information and not the original (accurate) memory of the event.

The second factor linked to memory impairment is retroactive interference a process which occurs when the memory for the new event interferes with the retrieval of the memory for the original event (Lindsay, 1990). In effect, the exposure of the witness to the misleading suggestion makes it more difficult for them to remember what actually happened.

Berkarian and Bowers (1983) evaluated the role of retroactive interference in memory recall. They argued that in the previous Loftus studies there was a confound between how the slides were presented in the learning phase and the test phase. In the Loftus studies the slides were in sequential order during the

learning phase and then in random order during the test phase. This lead Berkarian and Bowers to hypothesize that the sequence of the test slides would affect memory recall. More specifically, if the slides are in sequential order during testing the slides will act as cues to aid memory recall making it more accurate, regardless of whether or not misleading suggestions were made. The experiment was conducted in three phases. In phase 1, all subjects viewed slides of an accident. In phase 2, the subjects received post-event information that was either consistent or inconsistent with what they had viewed in the slides. Phase 3 consisted of the forced-choice test in which the subjects answered specific questions about the slides (this three phase experiment is the one traditionally used in the study of misleading suggestions).

The results indicate that when inconsistent post-event information is given and test slides are in random order there is a significantly higher error rate (40%) as compared to inconsistent post-event information with test slides in sequential order (13%).

These findings suggest that at the time of recall, questions and slides should be in sequential order. Such an order aids in memory recall, yielding low error rates, even when subjects have been given inconsistent post-event information. Perhaps sequential ordering of test slides aids in recall because the witness remembers the event in the order that things transpired, so therefore questioning the witness about things that occurred in sequence will aid in memory recall.

When recall accuracy has been impaired by misleading questions, researchers have debated over the credibility subjects accord to such inaccurate memories (Lindsay, 1990). What is being questioned is the source to which the subject attributes their memory, and errors of this nature are referred to as source-monitoring errors. When the subject says that they saw the suggested detail they are attributing this misleading suggestion to the actual event, rather than where it really came from, the post-event information (Lindsay, 1990). Source-monitoring differs from

overwriting in that the misleading suggestions do not necessarily have an effect on the subjects memory for the event, whereas in overwriting the original memory is altered (Lindsay & Johnson, 1989).

Lindsay and Johnson (1989) hypothesized that subjects given a test on source-monitoring would show less suggestibility than would subjects given a force-response (yes/no) test. According to this hypothesis tests used to measure suggestibility may actually induce the subject to make source-monitoring errors on critical test questions. The design of their experiment followed the traditional three phase paradigm mentioned previously.

The results indicated that subjects who were given the yes/no recognition test responded that they had seen more of the inconsistent objects from the post-event narrative than did control subjects. Those subjects that were given the source-monitoring test (asked from where they remembered the object: film, narrative, film and narrative or neither) did not demonstrate a suggestibility effect for inconsistent

post-event information. Lindsay and Johnson theorized that there was no suggestibility effect found in the source-monitoring test because the test instructions warned subjects that new information may be presented in the narrative.

The purpose of Lindsay and Johnson's (1989) second study was to eliminate the possible effect of the test instructions warning subjects about new information. Again the results indicated that on a forced-recognition test the subjects respond that they saw significantly more of the inconsistent post-event objects than do control subjects. The source-monitoring test in which there had been inconsistent post-event information given produced error rates identical to those of the control group. We can conclude that source-monitoring tests increase accuracy in memory recall because it forces the subject to evaluate their memory to see exactly where they learned about the object in question.

Effects of Credibility on Memory Recall

One can say that a person's ability to influence

others has a direct effect on their perceived credibility. Consequently a subject is more likely to use information given to them by a highly credible source than the same information presented by a source perceived as having low credibility (Nesler, Aguinis, Quigley & Tedeschi, 1993). People find a highly credible source more persuasive than a source of low credibility. Highly credible sources are associated with desirable outcomes. In turn desirable outcomes result in desirable associations being made connecting the source and outcome which. Therefore the result is the increased ability of a highly credible source at persuading others (Heesacker, Petty & Cacioppo, 1983).

To illustrate the impact of source credibility on target recall, consider the witness of an automobile accident being questioned by a police officer. If the questioner (police officer) is seen as naive of the accident events and presents information inconsistent with what actually happened, the subject will be less likely to accept the misleading information as being accurate. In contrast, a misleading suggestion given

by a questioner who is seen to be very knowledgeable about the accident events will result in the subject (witness) incorporating the suggested details into their memory of the event.

Smith and Ellsworth (1987) tested the hypothesis that the impact of misleading information is dependent upon the perceived credibility of the source; more specifically, that when the questioner was seen as an expert on the situation then misleading questions impair witness recall. Conversely, when the questioner was seen as naive about the situation, the misleading questions would not alter memory and in fact produce an error rate equal to that of subjects given irrelevant (unbiased) information. The post-event information contained either misleading (inconsistent) information or irrelevant information.

The findings confirmed their hypothesis: there were no significant differences in error rates for subjects questioned by a naive questioner and those questioned by a knowledgeable questioner, when post-event information was irrelevant. Conversely, subjects

asked misleading questions by a knowledgeable (ie. credible) questioner made more errors than did the subjects asked misleading questions by a naive questioner. In addition misleading questions asked by a naive questioner produced error rates that did not differ from controls.

These findings were replicated in a second study (Smith & Ellsworth, 1987) wherein the knowledgeability of the questioner was more pronounced. Taken together, the results clearly suggest that when a subject is asked a misleading question by a knowledgeable questioner, there will be a higher error rate. It appears that the expertise or credibility of the questioner plays a critical role in determining the effect inconsistent post-event information has on memory recall.

It has been suggested that source credibility may be related to observable characteristics like clothing. Gundersen (1987) examined the interaction between source credibility and clothing. Subjects were shown 6 drawings of 3 different styles of police uniform

(blazer and slacks, Eisenhower jacket and slacks, and the standard paramilitary uniform). After seeing the pictures the subjects filled out a "source credibility instrument", developed by Whitehead (1968) measuring trustworthiness, objectivity, professionalism, and dynamism.

The findings indicate that there was no significant difference for trustworthiness, dynamism and objectivity amongst uniforms; noteworthy, however, was the finding that "the blazer and slacks" uniform was perceived as being more professional by a significant number of subjects. The more professional a person is perceived as the more credible they are perceived as; professionalism leads to perceived credibility. From this experiment we can see that the clothing a person wears has an influence on the perceptions of professionalism and credibility that others feel towards them.

Summary of Findings

We have seen that inconsistent (misleading) post-event information can impair a witnesses' ability to

accurately recall memory for the event (Loftus and Palmer, 1974; Cole and Loftus, 1979; Loftus and Zanni, 1975; Pirolli and Mitterer, 1984). The effect misleading suggestions have on memory may be the result of overwriting of the original memory or retroactive interference (Lindsay, 1990; Berkarian and Bowers, 1983). Researchers have been not been able to clearly demonstrate which of these explanations provides the most parsimonious explanation. Another possible cause of memory impairment is source-monitoring errors in which the subject misattributes the post-event information to their memory for the original event. It has been shown that when a subject is forced to evaluate where their memory came from, misleading post-event information does not have a significant effect on accuracy of memory recall (Lindsay and Johnson, 1989).

Another factor that influences the effectiveness of inconsistent post-event information is the perceived credibility of the source (Nesler, Aguinis, quigley and tedeschi, 1993; Heesacker, Petty and Cacioppo, 1983; Smith and Ellsworth, 1987). A credible source is much

more influential than an non-credible source. In turn credibility has been linked to the clothing the source is wearing, wherein certain styles of dress are seen as more professional, and a high degree of professionalism is perceived as being more credible (Gundersen, 1987).

In evaluating all these findings one can conclude that there are a lot of factors that can influence memory. This leads to the question: How do clothing style (credibility) and misleading suggestions affect accuracy in memory recall. It could be said that a well dressed individual (highly credible source) who presents inconsistent post-event information will be more influential in altering the subjects memory of the original event. Conversely, a unkempt individual (source of low credibility) who presents inconsistent post-event information will not be successful in altering the subjects memory of the original event. However, the misleading question effect would be minimized if the subject were made to evaluate where their memory is derived from.

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Smith, V. L., & Ellsworth, P. C. (1987). The Social Psychology of Eyewitness Accuracy: Misleading Questions and Communicator Expertise. Journal of Applied Psychology, 72(2), 294-300.

Annotated Bibliography

Berkarian, D. A., & Bowers, J. M. (1983).

Eyewitness Testimony: Were We Misled? Journal of Experimental Psychology: Learning, Memory and Cognition, 9(1), 139-145.

This article discusses the sequencing of slides during testing, misleading question effect and retroactive interference.

Cole, W. G., & Loftus, E. F. (1979).

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In this article the misleading question effect was explored and supported.

Gundersen, D. F. (1987). Credibility and the Police Uniform. Journal of Police Science and Administration, 15(3), 192-195.

This article incorporated the definition of credibility as being associated with style of dress. The experiment showed that well dressed people are seen as more professional and consequently are more credible.

Heesacher, M., Petty, R. E., & Cacioppo, J. T.

(1983). Field Dependence and Attitude Change: Source Credibility Can Alter Persuasion by Affecting Message-relevant Thinking. Journal of Personality, 51(4), 653-666.

This article defined why a highly credible source is seen as more persuasive.

Lindsay, D. S. (1990). Misleading Suggestions Can Impair Eyewitnesses' Ability to Remember Event Details. Journal of Experimental Psychology: Learning, Memory and Cognition, 16(6), 1077-1083.

The article discussed the possible explanations of memory impairment: overwriting and retroactive interference.

Lindsay, D. S., & Johnson, M. K. (1989). The Eyewitness Suggestibility Effect and Memory for Source. Memory and Cognition, 17(3), 349-358.

This article pertained to overwriting and source-monitoring. An experiment was conducted to examine the source-monitoring explanation of memory impairment.

Loftus, E. F., & Palmer, J. C. (1974).

Reconstruction of Automobile Destruction: An Example of the Interaction Between Language and Memory. Journal of Verbal Learning and Verbal Behavior, 13, 585-589.

The earliest experiment found that examined the misleading question effect. The experiment used five distinct verbs to have subjects estimate the perceived speed of the vehicles in the accident. Also a precise definition for leading questions was given.

Loftus, E. F., & Zanni, G. (1975). Eyewitness

Testimony: The Influence of the Wording of a Question. Bulletin of the Psychonomic Society, 5(1), 86-88.

The misleading question effect was explored using definite "the", and indefinite "a" articles.

Nesler, M. S., Aguinis, H., Quigley, B. M., &

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This article was used to obtain the different possible definitions of credibility.

Pirolli, P. L., & Mitterer, J. O. (1984). The Effect of Leading Questions on Prior Memory: Evidence for the Coexistence of Inconsistent Memory Traces. Canadian Journal of Psychology, 38(1), 135-141.

This article provided supporting documentation of the misleading question effect.

Riggio, R. E., & Throckmorton, B. (1988). The Relative Effects of Verbal and Nonverbal Behavior, Appearance, and Social Skills on Evaluations Made in Hiring Interviews. Journal of Applied Social Psychology, 18(4), 331-348.

This article discussed how appearance (dress) effects people's perceptions.

Smith, V. L., & Ellsworth, P. C. (1987). The Social Psychology of Eyewitness Accuracy: Misleading Questions and Communicator Expertise. Journal of Applied Psychology, 72(2), 294-300.

This article examined the misleading question effect and how it can be influenced by the credibility of the questioner. Here credibility was defined as being knowledge of the situation.

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Research has demonstrated that inconsistent post-event information, particularly when offered by a highly credible source, can influence on accuracy of memory recall. The present study, using 43 university students, examined the combined effects of question wording and source credibility. Questions were worded so that they were leading (consistent), misleading (inconsistent) or unbiased (irrelevant) to the actual events. Credibility was manipulated by altering the interrogator's style of dress (suit or unkempt appearance). It was hypothesized that: (a) inconsistent post-event information given by a high credibility source impedes memory of the event more than the same information given by a low credibility source and, (b) consistent post-event information given by a high credibility source produces better memory recall than the same information presented by a low credibility source. Results will be discussed.

At some point in every person's life one is going to be asked to specifically recall the details of some previous event, such as an automobile accident. In order to get an accurate picture of the accident the questioning police officer will require an accurate reconstruction of the event by the witness. There are many factors that may impede the accuracy of the witnesses' recall. For instance it has been shown that

the wording of the question can have a significant impact on memory (Loftus & Palmer, 1974; Cole & Loftus, 1979; Loftus & Zanni, 1975; Pirolli & Mitterer, 1984). More specifically, if the question contains inconsistent information (i.e., it is misleading), then the witnesses' memory may be impaired. If post-event information is consistent with the actual witnessed events then the witness is lead to the correct answer; however, if the post-event information is inconsistent with the actual events then the witness is lead to an incorrect answer. Ultimately the best type of question to ask is one that is unbiased in that it does not contain any suggestions, be they leading or misleading. An unbiased question is open ended in that it allows the witness to formulate their own, independent answer to the question being asked.

A related factor that may influence accuracy in memory recall is the perceived qualities of the person asking the questions; specifically, their credibility. It has been found that a source with high perceived credibility who presents misleading post-event

suggestions will be more influential in altering the witnesses' memory than a source with low perceived credibility presenting the same suggestion (Smith & Ellsworth, 1987). In the aforementioned experiment credibility was defined as the knowledgeability of the source. Credibility has also been associated with the observable characteristics of the source, such as their clothing (Gundersen, 1987). Gundersen (1987) found that a well dressed source is seen as more professional, and professionalism implies credibility.

The present study examines how the wording of a question and the credibility of the questioner interact to influence the accuracy of eyewitness recall. The experiment utilized a 2 (credibility: high/low) x 3 (question type: consistent/inconsistent/unbiased) factorial design. Credibility was manipulated by the altering the interrogator's style of dress (i.e., unkempt appearance, reflective of low source credibility and professional appearance, reflective of high source credibility). The wording of a question was such that it was either: consistent (leading the subject to the correct answer), inconsistent (leading

the subject to an incorrect answer) or unbiased (implied nothing to the subject) in relation to the witnessed events. It was hypothesized that:

(a) inconsistent post-event information given by a high credibility source impedes memory of the event more than the same information given by a low credibility source and, (b) consistent post-event information given by a high credibility source produces better memory recall than the same information presented by a low credibility source.

METHOD

Participants

Participants were 43 undergraduates who received one research credit for their participation in the experiment.

Design

The design of the experiment was a 2 (Credibility: high and low) x 3 (Question Type: consistent, inconsistent and irrelevant) completely between-subjects factorial design. Credibility was manipulated by altering the questioners style of dress. An unkempt appearance reflected low source credibility and a

professional appearance reflected high source credibility. The wording of a question was such that it was either consistent, inconsistent or unbiased in relation to the witnessed events. The two groups (high and low credibility) given the unbiased interrogations will be used as a control group. Participants were randomly assigned to 1 of the 6 groups. The design is illustrated in Figure One.

	HIGH CREDIBILITY	LOW CREDIBILITY
CONSISTENT QUESTIONS (LEADING)	8 participants	7 participants
INCONSISTENT QUESTIONS (MISLEADING)	10 participants	9 participants
UNBIASED QUESTIONS (CONTROL)	5 participants	4 participants

Figure One

Procedure

Upon reporting to the experiment participants viewed a 20 minute clip of the 1972 film, "The New Centurions", in groups of three. Approximately 10 minutes into the clip there was a 1 minute scene of a

bank robbery. After viewing the film clip participants independently responded to a series of 19 questions that were asked by a confederate (interrogator). See Appendix One. Of these 19 questions 5 contained either the leading, misleading or unbiased information. The 19 interrogation questions were modified versions of those used by Smith and Ellsworth (1987, Study One), and formed the credibility manipulation.

There were 3 separate interrogations formulated, one for each question type. The same interrogation questions were used in the high and low credibility conditions. Half of the participants received the high credibility interrogation (i.e. the interrogator was well dressed) while the remaining participants received the low credibility interrogation (i.e. the interrogator's appearance was very unkempt). A well dressed interrogator was a clean shaven man wearing dress pants, a white shirt, tie, blazer and dress shoes (i.e., the experimenter looked very professional). In contrast, an unkempt appearance consisted of a man wearing old tattered and ripped sweat pants, a ripped and stained t-shirt, a baseball hat and running shoes.

Upon completion of the interrogation, participants engaged in a 20 minute distracter task which consisted of word searches. In all, there were 4 word searches generated requiring participants to find 80 Psychology terms. The participants then were administered a memory recall test. On the recall test, participants were first asked to give a narrative account of the bank robbery, and then responded to a series of 35 questions, 5 of which were used in analysis. These 5 questions referred to the critical items of the interrogation which were either consistent, inconsistent or irrelevant.

There were two dependent variables used in the experiment. Firstly, the error rate was examined for each subject. The error rate reflected the number of the 35 questions the subject incorrectly responded to. A response was deemed incorrect if it differed from what was presented in the film. The second dependent variable used was accuracy rate. The accuracy rate was the number of critical questions correctly responded to (according to what actually happened). These results are presented in terms of percent of participants

making errors on the critical questions.

Results

Contrary to the hypotheses, significant differences between error rates for the six groups were not obtained, $p > .05$ ($p = .107$) for question type; $p > .05$ ($p = .123$) for credibility; and $p > .05$ ($p = .940$) for the interaction between question type and credibility.

Further analysis revealed that there were slight differences in the error rates between the six groups. The error rate was the number of questions (out of 35) the participant got wrong on the recall test.

For instance the high credibility group had fewer overall errors (4.05) than the low credibility group (6.45). The misleading group (inconsistent questions) had an average of 7.24 questions wrong, whereas the leading group (consistent questions) had 5.41 questions wrong, and the control group had the fewest average number of errors at 3.1 questions wrong. See Figure Two.

AVERAGE ERROR RATES

	HIGH CREDIBILITY	LOW CREDIBILITY	QUESTION AVERAGE
CONSISTENT QUESTIONS (LEADING)			5.41
INCONSISTENT QUESTIONS (MISLEADING)			7.24
UNBIASED QUESTIONS (CONTROL)			3.1
CREDIBILITY AVERAGE	4.05	6.45	

Figure Two

The accuracy rate was the number of critical questions that were correctly responded to (reported in percentage). The Analysis of Variance examining the accuracy rate revealed that $p > .05$ ($p = .158$) for question type; $p > .05$ ($p = .654$) for credibility; and, $p > .05$ ($p = .775$) for the interaction between credibility and question type. Due to the lack of significant values the accuracy rate was then examined according to the percent of participants making errors on the critical questions. This analysis revealed that there were slight differences between the groups that would appear to be significant, but in fact are not. The

However, the lack of statistical significance prohibits me from drawing direct conclusions from the data.

Regardless of the lack of significance the data does suggest that misleading suggestions are more potent in altering memory when they are given by a source of high perceived credibility.

It is quite feasible that had there been more participants the differences between the groups would have been significant. It is also possible that appearance of the interrogator is not that important, however this is hard to believe because of the evidence supporting impression formation. The experiment will be run again in an attempt to solicit additional participants.

This experiment has practical implications especially for the police when they are questioning potential witnesses. When questioning witnesses police officers must be very careful to avoid using misleading questions if they, the police, want an accurate reconstruction of the event. This is because police officers are well dressed, with a very professional appearance, and the results of this experiment suggest

high credibility group had the highest accuracy rate at 86%, while the low credibility group had an accuracy rate of 84.8%. Surprisingly the misleading group had a higher accuracy rate (81.8%) than the leading group (81.4%), however the difference was very small. The unbiased (control) group had the overall highest accuracy rate at 93% of the critical questions being answered correctly. See Figure Three

PERCENT PARTICIPANTS MAKING ERRORS

	HIGH CREDIBILITY	LOW CREDIBILITY	AVERAGE
CONSISTENT QUESTIONS (LEADING)	80%	56%	68%
INCONSISTENT QUESTIONS (MISLEADING)	50%	57%	54%
UNBIASED QUESTIONS (CONTROL)	25%	20%	23%

Figure Three

Discussion

The data suggest that when a high credibility source asks misleading question then the witnesses' memory is altered, in that they incorporate the suggested detail into their memory of the event.

that misleading suggestion have more of an impact on altering memory when they are given by a source of high credibility. The police officers professional appearance gives him/her this increased perceived credibility in the eyes of the witnesses. Therefore police must carefully monitor the wording they use when asking questions.

Appendix One

Interrogator's questions

1. How many robbers were there?
2. What did they look like?
3. Were they wearing masks?
4. Were they wearing jackets? What kind? Colour?
5. What kind of pants were they wearing?
- *6. What kind of gloves were the robbers wearing?
WERE THE ROBBERS WEARING WEDDING BANDS? (Were the robbers wearing gloves?)
7. What kind of weapons did the robbers have?
8. Describe the gun the blue guy had.
- *9. What did the second robbers gun look like? WHICH ONE OF THE ROBBERS PULLED HIS GUN OUT? (Did the other guy have a gun?)
10. Did the robbers get away?
11. Were there any police there? How man?
12. How many tellers were there?
- *13. Including the police officer, was everyone in the bank black? NOT INCLUDING THE POLICE OFFICER, WAS EVERYONE IN THE BANK BLACK? (Did the witnesses to the robbery, tellers and police officers represent a variety of races?)
- *14. Where was the getaway car parked? HOW DID THE ROBBER TRY TO EVADE THE POLICE? (Did you see a getaway car?)
15. What did the robbers say?
- *16. How many shots were fired in the bank? WAS THERE A LOT OF GUNFIRE OUTSIDE OF THE BANK? (Was there an exchange of gunfire?)
17. What time of say was the robbery?
18. Was anybody tied up?
19. Did everybody in the bank realize what was going on?

NOTE: These questions were adapted from Smith and Ellsworth (1987).

NOTE: Asterisk denotes the critical questions; the leading versions of the questions are in capitals and the unbiased versions of the questions appear in parentheses.

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