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EYEWITNESS TESTIMONY

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16. Abstract <p>This report has dealt with the following question: When a person has witnessed some unusual event such as a traffic accident, how can complete and accurate information best be obtained about that event? The research focuses specifically on the influence that questions asked subsequently to an event have (1) on the answers to those questions, (2) on the answers to subsequent questions, and (3) on the witness' memory for the incident he has experienced. A major conclusion is that questions asked subsequently to an event can contain new information which becomes integrated into the original memory, causing an alteration or a reconstruction of the witness' memory for that event.</p> <p>In many of the experiments described, subjects viewed a film or a video tape depicting a complex event like a traffic accident. After the event, the subjects were asked either neutral or biased questions. The former produced more accurate answers. In other experiments, after being asked either neutral or biased questions, the subject waited a period of time, and was then retested to assess the effects of the initial questions. Again, a person who is asked biased questions initially, gives biased answers to questions that are asked of him later on. Some recommendations are given for how questions can be asked in as neutral a way as possible. In addition, other factors that are known to affect the accuracy and completeness of an eyewitness account are briefly outlined.</p>		
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INTRODUCTION

The accident or police investigator, the lawyer, the social scientist and others share a common concern: when a person has witnessed some unusual event, such as a traffic accident, how can complete and accurate information best be obtained about that event? Presently, there is agreement that witnesses to such events report them inaccurately, even to the extent that they will "testify to a substantial proportion of 'facts' which are not facts at all." (Marshall, 1966, p. 59).

Some scientists interested in eyewitness testimony have considered the possible causes of distortions in the recollection of witnesses, focusing their research efforts upon the influence of the specific questions which are asked about the recollection. Prior to World War I, much of the research conducted on the psychology of testimony occurred in Europe. Whipple's annual reviews, published in the Psychological Bulletin, from 1909 to 1918, serve as the major comprehensive source for the results of this European work. One notable piece of research from that period, and one dealing specifically with the influence of the form of a question on testimony obtained from a witness is that of Bernard Muscio (1915). Muscio showed "moving pictures" to his subjects and then interrogated them about events that they had just witnessed. Muscio used eight forms of questions of varying suggestiveness and tabulated the accuracy of the answers for each type of question. Among his other findings, Muscio found that the most reliable form of question was one that referred to the actual seeing of an event, and which did not use either the definite article ("the") or a negative term. Further, Muscio showed how the various forms of questions could be used to elicit desired answers from a witness.

A witness to an event might be asked to write out a narrative account describing exactly what he saw, or he might be asked to answer a series of questions based upon the event. The former method of obtaining testimony is called narrative report while the latter is known as interrogatory report. A good deal of research using these two methods has been conducted over the last 70 years and has indicated that relative to a narrative report form, an interrogatory report is more complete but less accurate (Gardner, 1933; Marquis, Marshall, & Oskamp, 1972; Marston, 1924; Whipple, 1909). Thus, one conclusion that might be reached is that when people are forced to answer specific questions, their accuracy suffers, and further, that some questions affect accuracy more than others.

Several early investigators inquired whether the various methods of obtaining testimony about some event differentially influence a subsequent effort to obtain testimony about that event (Cady, 1924; Whitely & McGeoch, 1927; Snee & Lush, 1941). Cady (1924) asked for both a narrative and an interrogatory report from her subjects, but reversed the order of the two types of report for different groups. More accurate testimony was obtained when the narrative report occurred first. Snee and Lush (1941) concurred with Cady's conclusion and further reported that the narrative-interrogatory order produced more correct responses, fewer "don't know" responses, but no appreciable change in the frequency of incorrect responses. Whitely and McGeoch (1927), who confined their attention to the situation where the subsequent report was separated from the first interrogation by at least 30 days, concluded that the narrative-interrogatory order had "a facilitating effect upon subsequent narrative recall at 30, 60, 90, and 120 day intervals" (p. 284).

While it appears that the method by which testimony is obtained from a

witness can influence both the accuracy of the immediate answers and the accuracy of a subsequent report, the findings of these earlier investigators are generally presented with insufficient detail to achieve a clear understanding. For example, Whitely and McGeech's finding that the addition of an interrogatory report after an initial narrative report has a facilitating effect upon subsequent narrative recall could arise this way: a subject reports as many details as he can and is then asked specific questions; forgotten facts contained in these specific questions could then be included in the subsequent report. For example, suppose a bystander has witnessed an automobile accident, has described the accident to the police, and is then asked, "Did you hear the brakes screeching?" In a subsequent report to the police, the witness may include a description of the screeching brakes, even though he had initially forgotten to mention them. It seems likely that questions asked subsequent to an event might lead to the introduction of "true" items into a subsequent free report but might also lead to the introduction of "false" items.

A major purpose of the present research is to study the effects of the initial questions used to interrogate a person about an event he has witnessed. The first section summarizes research suggesting that the wording of such initial questions can have a substantial effect on the answers given. The next section summarizes research showing that the wording of the initial questions can also influence the answers to different questions asked at some later time. Finally, a discussion of these findings develops the thesis that questions asked about an event shortly after it occurs may affect, in terms of an alteration or a distortion, the development of a witness's memory for that event.

EXPERIMENTAL RESEARCH ON QUESTIONS

Answers depend on the wording of questions

How tall? versus How short?

A nice example of how the wording of a question can affect a witness' answer to it was reported by Harris (1973). His subjects were told that "the experiment was a study in the accuracy of guessing measurements, and that they should make as intelligent a numerical guess as possible to each question (p. 399)." There was then asked either of two questions such as "How tall was the basketball player? or "How short was the basket ball player?" Presumably the former form of the question presupposes nothing about the height of the player, whereas the latter form involves a presupposition that the player is short. On the average, subjects guessed about 79 inches and 69 inches, respectively. Similar results appeared with other pairs of questions. For example, "How long was the movie?", led to an average estimate of 130 minutes, whereas, "How short was the movie?", led to 100 minutes.

The versus A

In this, and the next few experiments to be described, subjects viewed a film of an automobile accident, and then answered questions about events occurring in the film. In this study, 100 students viewed a short film segment depicting a multiple-car accident. Immediately afterwards, they filled out a 22-item questionnaire which contained six critical questions. Three of these asked about items that had appeared in the film, whereas the other three asked about items not present in the film. For half the subjects, all the critical questions began with the words, "Did you see a ...?" as in "Did you see a broken headlight?" For the remaining half, the critical questions began with the words, "Did you see the..." as in "Did you see the broken headlight?"

Thus, the questions differed only in the form of the article, the or a. One uses the when one assumes the object referred to exists and may be familiar to the listener. An investigator who asks, "Did you see the broken headlight?" essentially says, "There was a broken headlight. Did you happen to see it? His assumption may influence a witness' report. By contrast, the article "a" does not necessarily convey the implication of existence.

When the percentage of "yes," "no," and "don't know" responses were tabulated, it became clear that witnesses who received questions with the were much more likely to report having seen something that had not really appeared in the film; 15 per cent in the the group said "yes" when asked about a nonexistent item; while only seven per cent in the a group made that error. On the other hand, witnesses who received questions with a were more likely to respond "don't know," both when the object has been present and when it had not. The percentages are given in this table:

Percentage of "Don't know" responses to questions with "a" or "the"

<u>Item present</u>		<u>Item not present</u>	
The	A	The	A
23%	51%	13%	38%

Speed Estimation

To determine whether the substitution of one word for another could affect quantitative judgements, e.g., judgements of speed, the following experiment was designed. Forty-five subjects saw seven films of traffic accidents, and were then asked questions about the accident. For some of the subject-witnesses the critical question was "About how fast were the cars going when they hit each other?" For others, the verb "hit" was replaced with "smashed," "collided," "bumped," or "contacted." Although these words all refer to the coming together of two objects, they differ in what they imply about speed and force of impact.

The results showed that the subjects' estimates varied considerably, depending on which question they had to answer. Those questioned with contacted and hit gave the lowest speed estimates, while those questioned with smashed gave the highest. The average speed estimate given to each question is shown in this table:

Average speed estimates for different verbs

Smashed	40.8 mph
Collided	39.3
Bumped	38.1
Hit	34.0
Contacted	31.8

Four of the films involved staged crashes, and the exact speed of the cars involved was known: For one film, the cars were traveling 20 mph, for another 30 mph, and for two others, 40 mph. The average estimates for these collisions were 37.7, 35.2, 39.7 and 36.1 mph, respectively. These figures bear out previous findings that people are not very good at judging the speed of a vehicle.

Specific versus general nouns

In one experiment 100 subjects were shown a film of an accident and then answered questions about the film. Half of the subjects were asked critical questions using a general noun, for example "Did you see a car?" whereas the other half answered a corresponding question with a specific noun, e.g., "Did you see a sportscar?" For both responses to questions about items that were present and responses to questions about items that were not present, subjects were more likely to say "no" when interrogated with a specific noun. The data are shown in this table on the following page.

Responses to items that were present in the film
(Percentages)

Response	Specific	General
Yes	53	62
No	36	28
Don't know	11	10

Responses to items that were not present in the film
(Percentages)

Response	Specific	- General
Yes	14	25
No	79	66
Don't know	7	9

Although subjects were more likely to say "no" to a specific noun, the effect is very small.

Question wording and answers to subsequent questions

The experiments described in the last section demonstrate the effect of the wording of a question on its answer. In this section, the experiments demonstrate that question wording can affect the answers to other questions subsequently asked, often considerably later.

Influencing the report about an existing object

One hundred-fifty students were shown a film of a multiple-car accident in which one car, after failing to stop at a stop sign, makes a right-hand turn into the main stream of traffic. In an attempt to avoid a collision, the cars in the oncoming traffic stop suddenly and a five-car, bumper-to-bumper collision results. The film lasts less than one minute, and the accident occurs within a four-second period. At the end of the film, a 10-item questionnaire was administered. A diagram of the situation labeled as

"A" the car that ran the stop sign and as "E" through "E" the cars involved in the collision. The first question asked about the speed of Car A in one of two ways:

- (1) How fast was Car A going when it ran the stop sign?
- (2) How fast was Car A going when it turned right?

Seventy-five subjects received the "stop sign" question (1) and 75 received the "turned right" question (2). The last question was identical for all subjects: "Did you see a stop sign for Car A?" Subjects responded by circling "yes" or "no" on their questionnaires.

In the "stop sign" condition, 53% of the subjects responded "yes" to the question "Did you see a stop sign for Car A?" whereas only 35% in the "turned right" group claimed to have seen the stop sign. Thus, the wording of a presumption into a question asked immediately after a recently-witnessed event affected the answer to a question about that presupposition asked a short time later. In this case, the presupposition referred to an object that did, in fact, exist.

There are two possible reasons why this effect occurs. One is that when a subject answers the initial stop sign question, he somehow reviews, or strengthens, or in some sense makes more available certain memory representations corresponding to the stop sign. Later, when asked "Did you see a stop sign...?", he responds on the basis of the strengthened memorial representation.

A second possibility may be called the "construction hypothesis." In answering the initial stop sign question, the subject may "visualize" or "reconstruct" in his mind that portion of the incident needed to answer the question, and so, if he accepts the presupposition, he introduces a stop sign into his visualization whether or not it was in memory. When interrogated later about the existence of the stop sign, he responds on the basis of his earlier supplementation of the actual incident. In other words, the subject may "see" the stop sign that he has himself constructed. This would not tend to happen when the initial question refers only to the right turn.

The construction hypothesis has one enormously important consequence. If a piece of true information supplied after the accident augments his memory, then by supplying a piece of false information, in a similar way, it should be possible to introduce into memory something that was not in fact in the scene. The next few experiments described demonstrate that in fact new false information introduced after an event can influence a person's recollection of the event.

Influencing recollections about a quantitative fact

Forty students were shown a three-minute video tape taken from the film "Diary of a Student Revolution." The sequence depicted the disruption of a class by eight demonstrators; the confrontation, which was relatively noisy, resulted in the demonstrators leaving the classroom.

At the end of the video tape the subjects received one of two

questionnaires containing one key and nineteen filler questions. Half were asked, "Was the leader of the four demonstrators who entered the classroom a male?" whereas the other half were asked, "Was the leader of the 12 demonstrators who entered the classroom a male?" They responded by circling "yes" or "no."

One week later, all subjects returned and, without reviewing the video tape, answered a series of 20 new questions about the disruption. The subjects were urged to answer the questions from memory, not to make inferences. The critical question here was, "How many demonstrators did you see entering the classroom?"

The results indicated that the subjects who had previously been asked the "12" question reported having seen an average of 8.85 people one week earlier, whereas those who were asked the "4" question recalled 6.40 people. The actual number was, it will be recalled, eight. This result shows that a question containing a false numerical presupposition can, on the average, affect a witness' answer to a subsequent question about that quantitative fact.

Influencing subjective recollections

An experiment was conducted using the same stimuli as were used in the previously described study. Here we attempted to influence a witness' subjective feelings about an event. Fifty-six students saw the video tape, and then answered questions about it. Half of the subjects received questions which were worded and phrased in an "active, aggressive manner" (e.g., "Did you notice the militants threatening any of the students?"), whereas the remaining subjects received questions which were worded in a more "passive" way (e.g., "Did you notice the demonstrators gesturing at any of the students?"). One week later, without reviewing the video tape, the subjects were asked a new series of questions, some of which required them to rate (on a five-point scale) the event (e.g., how noisy? how violent?, etc.).

The results indicated that relative to the subjects receiving the passively worded questionnaire, subjects whose initial questionnaires were aggressively worded recalled the incident as more noisy, more violent. Further, the latter group thought the demonstrators were more belligerent, and that the students' reaction to the demonstration was more antagonistic.

This experiment shows that question wording can influence a person's subjective feelings about an event he has witnessed.

Recalling an object that did not exist

In this section, three experiments are briefly described in which initial questions asked about an event caused people to recall objects which did not exist at all.

(1) One hundred-fifty students viewed a brief video tape of an automobile accident and then answered ten questions about the accident. The critical one concerned the speed of a white sports car. Half of the

subjects were asked "How fast was the white sports car going when it passed the barn while travelling along the country road?", and half were asked, "How fast was the white sports car going while travelling along the country road?" In fact, no barn appeared in the scene.

All subjects returned one week later and, without reviewing the video tape, answered ten new questions. The final one was, "Did you see a barn?" The results indicated that 17.3% of the subjects who had been exposed earlier to the question containing the false presupposition of a barn, claimed they had seen a barn. Only 2.7% of the remaining subjects (not exposed to false information) said they saw a barn. Thus, an initial question containing a false presupposition influenced people's tendency to later report the nonexistent object corresponding to the presupposition.

(2) To extend the above finding beyond the single example, another experiment was conducted with one hundred-fifty subjects. Using five critical questions the result described in the previous study was replicated. Namely, an initial question containing a false presupposition that suggests that a nonexistent object did in fact exist can cause people to think they saw the nonexistent object.

(3) In an experiment described more fully in Loftus & Palmer (1974) subjects viewed a film of an automobile accident and then answered questions. Some subjects were asked "About how fast were the cars going when they smashed into each other?", whereas others were asked the same question with "hit" substituted for "smashed." On a test given one week later, those people who were questioned with "smashed" were more likely than those questioned with "hit" to agree--when asked about it--that they saw broken glass in the scene, even though none was present in the film. One reason this may happen is that the initial representation of the accident the subject has witnessed is modified toward greater severity when the investigator uses the term "smashed." The "smashed" question supplies a piece of new information, namely, that the cars did indeed smash into each other. On hearing the "smashed" question, some subjects may reconstruct the accident, integrating the new information into the existing representation. If so, the result is a representation of an accident in memory that is more severe than, in fact, the accident actually was. In particular, the more severe accident is more likely to include broken glass.

Questions influence a witness' memory

It has been shown that the wording of the initial questions used to interrogate a person about an event he has witnessed can have two important effects:

- (1) An effect on the answers to those questions, and
- (2) An effect on the answers to different questions asked at a later time.

As a framework for discussing these results, it is proposed that two kinds of information go into a person's memory for some complex occurrence. The

first is information gleaned during the perception of the original event; the second is external information supplied after the fact. Over time, information from these two sources may be integrated in such a way that we are unable to tell from which source some specific detail is recalled. All we have is one "memory."

So, for example, when a person witnesses an accident, he first forms some representation of the accident. An investigator who asks about how fast were the cars going when they smashed into each other? supplies a piece of external information, namely, that the cars did smash into each other. When these two pieces of information are integrated, the subject has a memory of an accident that was more severe than in fact it was. Since broken glass is commensurate with a severe accident, the subject is more likely to think that broken glass was present.

The main point to be made is that it appears as if questions asked about an event actually change a witness' memory for the event. For a fuller discussion of the theoretical issues, see Loftus (1975).

RESEARCH ON OTHER FACTORS AFFECTING EYEWITNESS TESTIMONY

The way a question is worded is one of the many factors known to influence the accuracy and completeness of an eyewitness account. This section briefly outlines some of the other factors, and lists a few of the places in which further information can be found on that factor. The list of factors is divided into two classifications: factors in the situation, and factors in the witness himself.

Factors in the Situation

The Retention Interval

The time interval between an experience and a subsequent test for recollection of that experience is called the "retention interval." It is a well established fact that people are less accurate and less complete in their reports after a long retention interval than after a short one.

Some articles and books which discuss the retention intervals are:

- Gardner (1933)
- Hunter (1964)
- Hutchins & Slesinger (1929)
- Levine & Tapp (1973)
- Marshall (1966, 1969)
- Marshall, Marquis, & Oskamp (1971)
- Wall (1965)
- Weinstein (1957)
- Whipple (1909, 1914, 1918)

The salience or significance of the event

Significant events seem to be remembered better than insignificant ones. Relevant articles are:

Buckhout (1974)
Marshall, Marquis, & Oskamp (1971)

Expected versus unexpected events

People tend to remember expected events better than events which are unexpected. Further, people respond more quickly to expected events. Relevant articles are:

Biederman & Zachary (1970)
Marshall (1966)
Palmer, S. (1975)
Whipple (1914; 1918)

Repetition of a Report

Once a witness has made a statement, he tends to stick to it. The more often he repeats it, the less likely he is to change his statement. Relevant articles are:

Bem (1967)
Whipple (1909)

Moving versus nonmoving objects

Objects are much more easily noticed when they move than when they are at rest. Some faint or very small objects can be perceived only if they move. It follows that normal human beings do not respond as quickly to stationary objects as to objects which are moving, given that the object is sufficiently intense to be perceived while at rest.

Boring (1942)

Exposure time

The longer a witness has to look at something, the better he is at remembering it. Relevant articles are:

Buckhout (1974)
Whipple (1909)

Atmosphere of the interviewing

A relevant article is:

Marshall, Marquis & Oskamp (1971)

Authority of the interviewer

See the article by Marshall (1966)

Factors in the Witness

Here the findings are more controversial; relevant articles are listed below:

Sex of the witness

Cattell (1895)
Gardner (1933)
Levine & Tapp (1973)
Marshall, Marquis, & Oskamp (1971)
Marston (1924)
Wall (1965)
Whipple (1909, 1914)

Age of the witness

Brown (1926)
Gilligan (1972)
Levine & Tapp (1973)
Toch (1961)
Wall (1965)
Weinstein (1957)
Whipple (1909, 1911, 1913, 1918)

Biases, prejudices, knowledge & expectations

Marshall (1966)
Marshall, Marquis, & Oskamp (1971)
Whipple (1918)

Confidence, self confidence

Marshall (1969)
Marston (1924)
Whipple (1918)

Emotional state of the witness

Buckout (1974)
Ehrlich (1972)
Gerver (1957)
Marshall (1966, 1969)
Marshall, Marquis, & Oskamp (1971)
Rouke (1957)
Whipple (1914, 1915, 1917, 1918)

Illness

Buckout (1974)
Whipple (1909, 1911)

Race (Identifying a person of another race)

Luce (1974)
Malpass & Kravitz (1969)
Malpass, Lavigne, & Weiden (1973)

RECOMMENDATIONS

Question wording

The experiments described in this report confirm the fact that the way questions are worded can influence the answer obtained. A more damaging consequence of a badly worded question, however, is that the question can actually change a person's memory for some event he has witnessed.

Questions should always be worded in as neutral a way as possible. It is important that the question not contain any additional information, be it true or false, that can alter a person's memory. Some specific suggestions for words to use or avoid are outlined here.

1. Choice of adjectives and adverbs. For many pairs of adjectives, such as "long" and "short," or "big" and "low" one member of the pair is designated as unmarked and the other as marked. The unmarked member has a neutral use, and usually refers to the whole dimension and occurs in the dimension name (e.g., length, not shortness; height, not lowness). The marked member is not neutral. Thus, "How long was the movie?" is a neutral question, whereas "How short was the movie?" is not. The unmarked member of a pair should be used to elicit information whenever possible. Some additional examples of adjective pairs are:

Unmarked	Marked	Sample neutral question
much	little	How much smoke did you see?
heavy	light	How heavy was the set of weights?
hot	cold	How hot was the engine?
wide	narrow	How wide was the road?
old	young	How old was the driver?
deep	shallow	How deep was the puddle?
Often	seldom	How often have you driven this road?
tall	short	How tall was the passenger?
old	new	How old was the automobile?
large	small	How large was the dent?

2. The versus A. Questions with the definite article (e.g., Did you see the broken headlight?) should be avoided, unless the object in question has already been mentioned by the witness.

3. Speed estimates. To obtain information about the speed of moving vehicles, the question "About how fast were the cars going when they hit each other?" is more neutral than "About how fast...when they smashed into each other?" The question could also be asked in this way: Estimate the speed of the vehicles at the time of impact.

4. Mention of objects. The research indicated that a question which mentions some object (whether the object really existed or did not exist) causes a tendency for a witness to assert that he saw the object himself. Questions should be designed so that they do not mention objects before the witness mentions them himself.

5. Aggressive versus passive wording. If an investigator uses questions which suggest that an incident was noisy, violent, etc., the witness is likely to remember the incident that way. Here, too, neutrality is needed to insure an unbiased account.

The influence of other factors

It is important to be aware of the many factors that reduce the accuracy and reliability of an eyewitness account. Many of them have been mentioned in a previous section of this report. For example, other things being equal, a report given soon after an event is more likely to be correct than one given a long time after the event. A report about an event is more likely to be accurate if the witness had a long time to observe the event than if the witness had only a short time. These factors should be kept in mind whenever an investigator is evaluating the usefulness of some particular piece of eyewitness testimony.

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