11-1981

Recognition and recall memory as a function of intentional and incidental learning of an eyewitness account

Jill L. Ricke

RECOGNITION AND RECALL MEMORY AS A FUNCTION OF INTENTIONAL AND INCIDENTAL LEARNING OF AN EYEWITNESS ACCOUNT

BY

JILL L. RICKE

A THESIS

SUBMITTED TO THE GRADUATE FACULTY

OF THE UNIVERSITY OF RICHMOND

IN CANDIDACY

FOR THE DEGREE OF

MASTER OF ARTS

IN PSYCHOLOGY

NOVEMBER, 1981

RUNNING HEAD: EYEWITNESS TESTIMONY

RECOGNITION AND RECALL MEMORY AS A FUNCTION

OF INTENTIONAL AND INCIDENTAL LEARNING

OF AN EYEWITNESS ACCOUNT

BY

JILL L. RICKE

APPROVED BY:

Kenneth A Blick — Committee Chairman — 1/11/82 — Date

Frederick J. Kozub — Committee Member — 11 Jan 82 — Date

Committee Member — Jan. 11, 1982 — Date

Barbara A Shailey — Department Chairman — Jan 11, 1982 — Date

Table of Contents

Abstract

The purpose of this study was to investigate the relationship between recognition and recall memory as a function of intentional and incidental learning of an eyewitness event. A total of 188 college students participated in the experiment with 47 students in each of four conditions. The two learning conditions were produced by giving either intentional or incidental learning instructions while the two memory conditions, either recognition or recall, were defined on the basis of one of two forms of the retention questionnaire. All subjects viewed two groups of slides; the first group depicted a wallet snatching incident and the second group consisted of paired-associate nonsense syllables. The intentional learning group viewed the wallet snatching slides, which acted as a filler activity. The incidental learning group viewed the paired-associated nonsense syllable slides, which acted as a filler activity. One week following viewing of the slides, all subjects answered one of two forms of a 30-item questionnaire about the wallet snatching slides. One of the questionnaires, which measured recognition memory, consisted of multiple choice questions while the second form of the questionnaire, measuring recall memory, consisted of open ended, fill-in-the-blank questions. Quantitive and qualitative scores were obtained from correct, incorrect and answered, or unanswered responses on each questionnaire. It was hypothesized that there would be a learning X memory interaction for both the quantity and quality of response. Intentional learning with recognition memory was expected to produce the least quantity of responses and incidental learning with recall memory

was expected to produce the highest quantity of responses and incidental learning with recall memory was expected to produce the least quantity of responses. Intentional learning with recognition memory was also expected to produce the highest quality of responses and incidental learning with recognition memory would produce the lowest quality of responses. An additional hypothesis proposed was that a negative correlation would be found between the quantity and quality of response. Results indicate that there were no significant differences between the learning X memory conditions for either the quantity or the quality of response. However, recognition memory testing did produce more quantity and better accuracy of responses than the recall memory testing. In both learning conditions there were no differences found between intentional and incidental learning, therefore it was concluded that recognition memory produces better quantity and quality responses to an eyewitness event than recall memory with the type of learning, intentional or incidental, being inconsequential.

Recognition and Recall Memory as a Function of Intentional and Incidental Learning of an Eyewitness Account

Human perception and memory are two of the many factors which influence eyewitness testimony. The perception of an event by a witness can determine the guilt or innocence of people in our American society. Unfortunately, eyewitness testimony is very unreliable, but for many years this type of testimony has convicted many innocent people in the United States.

The releability of eyewitness testimony is affected by many variables which include stress, racial biases, effects of intervening observations and events, plus many others (Loftus, 1979a). The variables are all influenced by an individual's ability to perceive information, to process that information, to store the information, and to retrieve the information when called upon to do so. The smallest detail sometimes becomes very important for someone to remember in a courtroom situation. When details cannot be retrieved from memory, many people will "fill in" details to please the lawyers, judge, etc. (Buckout, 1974).

The experiencing of an event is very complex. Psychologists have theoretically analyzed the process and have divided it into three stages.

> "The first stage is the acquisition stage, which is the perception of the original event where information is encoded or entered into a person's memory system. Secondly, there is the retention stage, the period of time between the event and the eventual

> recollection of a particular piece of information, the third and final stage is the retrieval stage, when a person recalls stored information. This three stage analysis is so central to the concept of human memory that it is virtually universally accepted among psychologists" (Loftus, p. 21, 1979a).

The acquisition stage deals with the perceptual experience of the event. Some of the features are extracted and stored while others are not even perceived at all. During the crucial retention stage, "the witness may engage in conversations about the event, overhear conversations, or read a newspaper story" (Loftus, p. 22, 1979a), which may all drastically affect the retrieval stage. When a witness is asked to recreate the event, some of the information may be the original experience while some may be the incorporation of new information which the witness has experienced from a completely unrelated event and stored into his/ her long term memory along with the original experience. Therefore, the acquisition stage and the retention stage are crucial to what happens during the retrieval stage.

A thorough analysis of memory must account for the events at all three stages. Events at any of the stages may cause a retrieval failure. Accounting for this failure is a critical problem in memory research. The initial perception of the events at the acquisition stage could have been distorted. The events might have been perceived accurately, but were interfered with in some way during the retention stage; or the events might have been inaccessible, when questioned about them. These are all possible problems which might occur at

each stage, and the difficulty lies in accurately determining at which stage the source of failure has occurred.

The present study is concerned with failures at all stages. Information must be accurately perceived at the acquisition stage, accurately stored at the retention stage and accurately retrieved at the retrieval stage. Even after all of these conditions have been met, we can still find errors in the recollection of events. Frequently, it is common for two witnesses to report the same event differently. According to Loftus (1979a), this discrepancy is due to two groups of variables that affect a witness' ability in the acquisition stage to accurately perceive an event: event factors and witness factors. Event factors include: exposure time to the event, frequency; or the number of opportunities to perceive the event, detail salience to the observer, the type of fact being considered, and the violence of the event. Witness factors include factors that are inherent in any event that affect a person's ability to perceive an event, and also factors that are inherent in the witness. Examples of the first type of witness factors include stress, expectations, prejudices, and temporary biases. The other type of witness factors are characteristics that the witness possesses before the event occurs.

Studies researched on event factors to be discussed in the present study focus on the length of exposure time and the frequency of exposure, followed by detail saliency and the overestimation of facts. The studies conducted on witness factors will be discussed later.

Length of Exposure and Frequency of Exposure Time

Laughery, Alexander, and Lane (1971) studied the effects of length of exposure time to slides of human faces and the accuracy of remembering the target slide from a group of other slides. Subjects were exposed to the target faces for 10 seconds and the other subjects were exposed to the target faces for 32 seconds. As expected, the investigators found that subjects were much more accurate remembering a face that had been seen for the longer length of time.

Frequency, another event factor, refers to the number of times an observer is exposed to the stimulus event. The frequency that exposure has on memory has been firmly established by the work of Ebbinghaus. He is famous for his work with nonsense syllables and the introduction of the forgetting curve. Ebbinghaus found that the ability to recall the nonsense syllables were almost 100% accurate up to 20 minutes then sharply declined down to 40% accuracy at the end of one day and seemed to level off at 30% accuracy after two days until 31 days (Solso, 1979).

Detail Saliency and the Overestimation of Facts

Marquis, Marshall, and Oskamp (1971) studied the effects of detail saliency in a two-minute movie. The 151 volunteers between the ages of 21 to 64 were shown a film which involved a car accident and were told that they were witnesses to the events in the film and would be interviewed by an expert legal interviewer who had not seen the film. The saliency to a particular item was determined by the investigators in a preliminary study. High school students and staff members who worked with the researchers, were

shown the film and were asked to identify everything that was seen in the film. The saliency of an item was determined by the frequency with which an item was reported by the raters. A highly salient item was one which was reported very often and a low salient item was one which was not reported very often. The results of the study revealed that higher salient items were reported more often and accurately than were lower salient items.

The event factor concerned with the "type of fact" or otherwise referred to as the overestimation of facts, has been researched in studies conducted by Marshall (1966) and Johnson and Scott (1976). The tendency to overestimate time was the focus of the two experiments. The conclusion drawn from these studies gives evidence that people tend to overestimate the amount of time that it takes for complex events to occur. It was also found that when a person is very anxious or stressful there is a tendency to overestimate time (Sarason & Stoops, 1978).

Thus far, the event factors which have been discussed through the use of various studies have included: exposure time to an event, frequency of exposure, detail saliency, and the overestimation of facts. Studies depicting witness factors will be reviewed next.

The studies conducted on witness factors will first include anxiety, sex differences, and age; secondly, previous training; thirdly, expectancy, malleability of memory, and post event information; and finally field dependence.

Anxiety, Sex Differences and Age

The accumulation of undesirable life changes or life stress, are associated with anxiety and depression (Sarason, Johnson, and

Siegel, 1978). Siegel & Loftus (1978) furthered the research to determine whether life stress and the anxiety which accompanies this are negatively related to performance in eyewitness capabilities. Eighty-four college students completed a test of anxiety (Multiple Affect Adjective Checklist), a test of life stress (Life Experience Survey), an eyewitness testimony task, and the self-preoccupation scale. They found a negative correlation between the performance on the test of eyewitness ability and anxiety and the two preoccupation scales. Conclusions from the study reveal that there was a tendency for people who were experiencing life stress and anxiety to perform poorly on eyewitness ability tasks.

Mueller, Bailis, & Goldstein (1977) have shown that anxiety also affects facial recognition. Forty-eight male students and 49 female students were given an anxiety test to determine their level of anxiety. Subjects then looked at 50 black and white slides of faces presented at the rate of five seconds each. Directly after this, the above slides were mixed up with 50 new slides and then were shown again one at a time. The subjects were to indicate whether or not they had seen the slide before. The researchers found that highly anxious subjects did worse on this task than low anxious subjects.

Research on sex differences in eyewitness abilities have produced inconsistent results. Some studies (Lipton, 1977; Wittroyl & Kaess, 1957) have shown that women outperform men, other studies have shown that there is no difference in the accuracy of men and women on eyewitness ability (McKelvie, 1976). Lipton (1977) investigated psychological aspects of eyewitness testimony in a

courtroom setting. Sex was one of the factors which was looked at in order to determine accuracy and quantity of courtroom testimony based on eyewitness observations. Accuracy was computed as the total number correct items / total number of items mentioned, and quantity was computed as the total number of items reported / total possible items. The results indicated that female witnesses responded significantly more accurate to the questioning than did male witnesses, though the difference in quantity was nonsignificant.

Powers, Andriks, & Loftus (1979) found that there were no overall significant differences in accuracy when responding to a questionnaire regarding eyewitness observations. However, significant differences were found when looking at specific items. Women were more accurate than men when the item dealt with women's clothing and they were also more suggestible, but men were more accurate than women when the item dealt with the thief's appearance and the surrounding environment.

Powers et al. (1979) followed up on the previous research and confirmed that systematic sex differences in accuracy and suggestibility corresponded to the particular item content. A preliminary study was conducted with 25 males and 25 females, designed to select items that were most likely to be noticed by males, and items that were most likely to be selected by females. Seventy-five males and seventy females viewed an eyewitness account of a crime which depicted a man and a woman coming to the aid of a two people fighting in a parking lot. From the results, women were more accurate and less suggestible on the two previously designated female items, which were ascertained from the preliminary study,

and men were more accurate and less suggestible on the two previously designated male items, which were also ascertained from the preliminary study. These conclusions support the contention that both males and females tend to be accurate and suggestible on certain types of items. The researchers suggest that this is due to a difference in interest of particular items which are specific to each different sex.

Cross sectional studies have compared the different age groups as a factor in eyewitness ability. Ellis, Sheperd & Bruce (1973) studied a group of boys and girls who were 12 years old and the other half who were 17 years old. The subjects were shown 20 color slides of undergraduate students. Four hours later the slides were mixed up and added to 40 more slides of the same subject. The 60 slides were shown to the subjects who were to indicate whether they had seen the slide previously. The 17 year olds remembered faces 79% of the time and 12 year olds remembered faces 72% of the time. Other studies have found that 12 to 14 year olds outperform six to nine year olds (Goldstein & Chance, 1964, 1965), and Kagan, Klein, Haith, & Morrison (1973) found that 11 year olds outperform eight year olds who in turn outperform five year olds.

As age increases, performance on memory tasks vary. Schaie & Gribbin (1975) found that many tasks have shown a decrease in performance in the age range of 40 to 60. A conclusion or generalization might indicate that after a certain age eyewitness reliability tends to decline. However, this generalization is not correct because leading experts in the field have emphasized that performance on some tasks may decrease with age along with

memory for details, but one person may show a decrease while another person will not (Baltes & Schaie, 1976). Loftus (1979a) has concluded that "performance on some tasks may decline somewhat, but performance on others, such as memory for logical relationships and ability to make complex inferences, will not" (p. 160).

Previous Training

Previous training is another factor that has been studied in relation to eyewitness testimony. Ticknor & Poulton (1975) studied the issue of whether police officers who are trained in proper identification of criminals and witnesses, are actually capable of giving better testimony than lay people. Twenty-four police officers and 156 observers viewed a filmed street scene taken from a first floor window. The film showed the usual movement of traffic and pedestrians from one end of the street to another with the deliberate additional insertion of people and actions. The subjects had been previously shown some photographs and were specifically instructed to look for those people whose photographs had been seen earlier. Some of the subjects were to look for various instances of thefts or events, while others were asked to watch for more than one person. The results indicated that the people and the acts that took place nearest to the camera were observed more often then when they were further away. But, the performance of the police officers and the observers revealed that the police officers reported more thefts, then what actually occurred, than did the observers. However, there were no significant differences on the "true detections" of people between the police officer and the observers.

Palmer (1975) states that the best way to recognize a face is through individual features. Various training procedures have been developed which implement Palmer's approach of feature analysis. Breaking down the face into its characteristic components helps to discriminate between faces and facilitates better memory of a face. Woodhead, Baddeley & Simmonds (1979) attempted to investigate the issue of the feature approach by evaluating an ongoing training course using the above mentioned approach for recognizing people. In the first experiment, 24 photographs of faces of white males were presented to trainees who were signed up for the course and to control subjects that were not signed up for the course. The faces were shown of various poses, expressions, and disguises. The faces were shown one at a time for 10 seconds each. All of the subjects were told to look hard at the faces because later they would have to remember them. They were also warned that some of the faces might also appear with disguises. Fifteen minutes after the faces were viewed, 72 faces were presented and each subject had to indicate if they had seen it before or not. During the next three days, the 26 trainees attended the course on improving their recognition. The training included extensive work in lectures, field exercises, discussions, and case histories. The 22 control subjects went about their daily work. The subjects were all tested again on their ability to recognize faces. The results showed no significant effect by the training course on the ability to remember faces.

Expectancy, Malleability of Memory, and Post Event Information

A witness' expectancy can influence perception and memory of an event by telling a witness what will happen or by cueing a witness about what will happen. Thorson & Hochhaus (1977) studied the effects of 60 students who watched an eight second scene involving two cars in an accident at an intersection. Half of the subjects were told: "You are about to see a video tape of an eight second event. Watch carefully". The other half were told: "You are about to see an eight second scene of an automobile accident. First, what kind of cars were involved? Second, how many people were in each car? Third, how fast was each of the two cars going? Fourth, which car was at fault? Now, would you repeat the four questions?" Ten minutes after viewing the tape the subjects were given questionnaires to fill out. Some of the subjects were given leading questions and some of the subjects were given neutral questions. The results showed that subjects who were given the leading questions reported faster estimates of speeds. The subjects who were in the non-informed group had slower estimates than the subjects in the informed group.

Expectations can also be found in cultural biases that are an inherent witness factor. Allport & Postman (1947) had their subjects (college students and volunteers from the community) look briefly at a semi-dramatic drawing of several people on a subway train, including a black man and a white man whom were both standing up and talking to each other. However, the black man was wearing a coat and a tie and the white man was dressed in workman's clothes holding a razor in his hand. Fifty percent of the observers

reported that the black man was holding the razor. Buckout (1974) cautions that a witness must be careful when reporting events and must not allow personal biases to interfere with the actual perception of the event or the presentation of testimony.

The time between the perception of the event and the retrieval of an event is subject to slippage of memory and new information, also called malleability of memory. The new information may be presented at any time after the witnessing of an event and may become permanently incorporated into the original retained memory. The type of information this refers to is entitled post event information. "Post event information cannot only enhance existing memories but also change a witness' memory and even cause nonexistent details to become incorporated into a previously acquired memory" (Loftus, p. 55, 1979a). Bird (1927) provides an early example of how dramatically post event information can alter the memory. A newspaper reporter attended one of Bird's class lectures and later wrote an article giving an erroneous account of the lecture. Many of the students read the newspaper account. When Bird later gave an exam, after the usual questions, he told the students to indicate whether or not they had read the account in the newspaper. Those who had read the account made many more errors on the exam because they remembered the material from the newspaper account instead of the actual lecture.

Loftus (1975, 1979a, 1979b) and Loftus, Miller, & Burns (1978) have extensively investigated the phenomenon of malleability of memory and have found that by just mentioning an existing object, whether it was present or not, and presenting details which conflict with

certain aspects of the original stimulus, or introducing nonexistent objects after the event has concluded, increased the likelihood that it will be reported later. Not only will this new information be reported and recalled, but it will also be reported with greater confidence then was originally attached to the detail of that event. Loftus, Miller & Burns (1978) demonstrated the phenomenon mentioned above. A series of 30 color slides depicting an auto accident were shown to college students. Half of the subjects saw a stop sign in one of the slides and the other half saw a yield sign in the same slide. Immediately after viewing the slides the subjects filled out a questionnaire with the details of the accident. But, question 17 read differently. Half of the subjects received questionnaires which incorporated a stop sign in the item and the other half of the subjects had questionnaires which incorporated a yield sign in the item. All subjects then participated in a 20 minute filler activity. After the filler activity was completed, a forced choice recognition test was administered. Fifteen pairs of slides were presented with two slide projectors and the subjects were asked to specify the slide that they had seen earlier. The critical pair depicted a car at a stop sign and a car at a yield sign. The results indicated that when the question contained information consistent with the first series of slides, 75% of the subjects responded correctly while 41% responded correctly when presented with an inconsistent question.

Another experiment conducted by Loftus and Palmer(1974) investigated the effects of the introduction of nonexistent objects into memory, but without the actual mention of the objects. Forty-

five students were shown films of automobile accidents and then were asked questions which were worded with the inclusion of adverbs such as "smashed" or "hit". A test was then administered one week later and those subjects who had been given the verb "smashed" were more likely to report the existence of broken glass, even though it was not present in the actual film.

Field Dependence

Field dependence as a characteristic of eyewitness testimony was studied by Lerch (1981). The group embedded figures test was administered to the college students to determine field dependence or field independence. A series of 24 color slides depicting a wallet snatching incident were shown to the subjects. After completing a filler activity, the subjects answered an accuracy questionnaire which addressed diverse details of the slides. One week later the subjects returned and were given a suggestibility paragraph which included erroneous additions to the events that comprised the 24 color slides. Following the suggestibility paragraph, the subjects filled out the questionnaire a second time. It was predicted that field independent people would have fewer errors and would be more accurate when questioned about an eyewitness event than field dependent people. It was also predicted that field dependent people would be more open to post event suggestions and would incorporate the information into the recall of the eyewitness event than field independent people. Unfortunately, the field dependency or independency was a nonsignificant variable as an eyewitness factor. "One possible explanation of these results

has to do with the experimental situation itself. This study may not have replicated the real world. The experimenters' instructions to ask the subjects to watch an event on slides, and the subjects knowledge that they were going to be asked questions about the event may have counteracted any differences that were present" (Lerch, p. 25, 1981).

Thus far, studies investigating witness factors in eyewitness testimony have been reported. These include anxiety, sex differences, and age; previous training; expectancy, malleability of memory, post event information; and finally field dependence. Studies researching event factors in eyewitness testimony have also been reported. These studies included exposure time and frequency of exposure, plus detail saliency and the overestimation of facts. However, other factors could also be used as predictors in eyewitness ability. These factors, include recognition and recall memory in addition to intentional and incidental learning, which was the focus of the present study. Previous research in these areas will be reported beginning with studies investigating types of memory as shown in various forms of testimony and ending with types of learning in eyewitness events.

The form in which a question is given to a witness exerts a strong influence on the quality of the answer that is reported. A narrative type of report and an interrogatory type of report are the two types of reports used in courtroom proceedings and in other judicial settings. A narrative form entails the presentation of open ended questions while an interrogatory form entails

the presentation of multiple choice questions. Both forms of questioning can contain leading questions and suggestive questions which can also incorporate positive bias, negative bias, or no bias, being neutral. Cady (1924) staged an event in three introductory psychology classes. After the lecture had begun, the instructor announced that a government official would be visiting the classroom and would be giving a government test, which he advised all of the subjects to take. Directly following these instructions a man entered the classroom and exchanged two bundles of papers then left the room. His appearance lasted approximately five minutes. The instructor then distributed the papers and told the students to "write a detailed account of all that has happened since the representative left the room today. Include a description of his dress, personal appearance...no detail is too small to deserve mention. Quote in quotation marks any words used by either party" (Cady, p. 111-112, 1924). Following this, a list of 42 questions covering all details of the event were filled out. The results showed that more errors occurred when the subjects were forced to answer questions instead of when they were free to choose their own responses.

Other research has found the same results using filmed events instead of live events. Marquis et al. (1971) used 151 male subjects who viewed a two-minute color film depicting a scene with two college boys throwing footballs in front of a grocery store while a young couple carrying groceries leave the store. The woman was struck by a car at which point the driver of the car starts yelling at the woman for walking in front of him. The man that was

walking with her comes to help her out, and they all three begin a heated argument. Meanwhile, the two boys throwing the footballs appear. The scene concludes with one of the boys running to telephone the police. The subjects were questioned in different ways. In support of Cady's findings, Marquis et al. (1971) found that those who were allowed to report freely gave the most accurate reports. However, they were the least complete. Controlled narratives were also included such as "tell me about the traffic and weather conditions." From this type of questioning the reports were less accurate but were more complete. The other mode of questioning was in the form of very specific multiple choice questions such as "where did the incident happen: in a vacant lot, in a street, on a sidewalk?" (p. 172) This type of interrogatory report was less accurate than the narrative forms, but even more complete.

Further research in this area was conducted by Snee & Lush (1941), who studied the influence of one form of report upon another form given immediately thereafter. The college students were shown a one-minute film depicting an assault, theft, and an escape. The subjects were tested in either the interrogatory-narrative order or in the narrative-interrogatory order. When the interrogatory part of the test was preceded by the presentation of a narrative form of report, no significant changes in the number of inaccurate responses were incorporated into the interrogatory form of report, however it consistently increased the number of correct responses and decreased the number of "don't knows". When the interrogatory form was followed by the narrative form, there were more correct responses in the narrative with the addition

of more incorrect responses. The investigators concluded that traditional reports are affected by presenting a witness with another form of the report first. The type of material, answer, and form of report are all influential factors.

Lipton (1977) investigated the factors that affect the accuracy and the quantity of courtroom testimony based on eyewitness reports. The investigation measured loss in accuracy and quantity after a one-week delay. Eighty college students were shown a filmed murder, and then testified about their observations either immediately or after a seven-day delay. Testimony was reported either orally or in the form of responses to questions that were either open ended or multiple choice questions. All forms incorporated positive and negative biased questions, plus neutral questions. The results further supported the higher accuracy reports that are found in the narrative form, but with much lower quantity.

An assumption that was drawn from Lipton's research (1977) distinguishes incidental learning from intentional learning and their effects on memory. However, the two types of learning were not tested together in the study, the assumptions are based solely on expected results. The assumptions state that the significant instructions that are presented to the subjects prior to the experiment are of crucial interest when distinguishing between intentional and incidental learning. "If a person is told that he will be exposed to a stimulus and later questioned about it, he will likely attend more to the stimulus, enact intentional memory, and exhibit greater recall" (Lipton, p. 92, 1977). Lipton further assumes

that the situation does not actually represent typical eyewitness reports, which usually are unexpected and draw upon the incidental memory and poorer recall. The assumptions are mere speculations which were not tested in his study, however the present study will focus on the assumptions which were developed in Liptons' (1977) research.

The purpose of the present study was to investigate the relationship between two types of learning: intentional and incidental, and their effects on two types of memory: recognition and recall. The percentages of quantity and of quality of testimony for each of the subjects was measured. It was hypothesized that intentional learning would produce a higher quantity of responses in both the recognition memory and recall memory conditions with recognition memory producing more responses than recall memory. The incidental learning condition was expected to have a higher quantity of responses in the recognition condition but a lower quantity of responses in the recall conditions. The two types of learning were expected to produce significant differences in the form of an interaction. It was further hypothesized that the quality of responses would be the most accurate in the intentional learning and the recognition memory treatment conditions, with the recall condition in the intentional learning, also very high. The least accurate type of responses should have been in the incidental learning situation with the use of recognition memory. The recall memory condition in the incidental learning situation would also be low but not as low as the previously mentioned condition. There would also be a significant interaction in the quality of the responses in all treatment conditions. A

negative correlation was expected between the quantity of the response and the quality of the response.

Method

Subjects

One hundred eighty-eight students enrolled in four introductory psychology classes participated in the study. The experiment was conducted during the regular class period, consequently no research credit was given to the students. The four classes were randomly assigned to one of two conditions, and the students in any class were divided into two different groups. Forty-seven students were in each treatment condition. Each class was administered one of two procedures which delineated the classes into either intentional learning or incidental learning. The two different groups within each class were designated through the form of the questionnaire that the individual student received. The form was either form A or form B. Form A refers to the condition entitled "Recognition Memory" and form B refers to the condition entitled "Recall Memory". Recognition memory was studied through the direct presentation of questions related to diverse details of the event with many possible answers from which the subject chose the most correct one. Recall memory was studied through the presentation of open ended questions related to diverse details of the event with no possible rejoinders, however a blank was provided to be filled in with the most correct answer.

Apparatus and Materials

Twenty-four color slides depicting a wallet snatching incident in a small town in Washington State were used. The slides were reproductions of slides which were used by Loftus (1977, 1979a)

and Lerch (1981). A slide projector was used to present the slides at the rate of five seconds per slide.

A questionnaire to determine accuracy of the memory of the events was filled out one week after viewing the slides. The questionnaire had two forms, A and B, which both consisted of 30 items that addressed diverse details of the wallet snatching incident. Form A (Appendix C) was a reproduction of the questionnaire used by Loftus (1979a, 1979b) and Lerch (1981) consisting of 30 multiple-choice items with six alternative rejoinders of which only one was correct. This measured recognition memory. Form B (Appendix D) was a revised edition of form A. The revision entailed the removal of the six alternative rejoinders to the 30 multiple-choice items with the addition of a blank to be filled in with the correct rejoinder: this measured recall memory. Both forms of the questionnaire ask for information about the major characters, their clothing and actions, extraneous people, and other minor details including the buildings and the surrounding environment. The 30 items are declarative sentences and questions requiring a phrase or a word to complete them. These items were completed on form A with one of the six choices listed on the questionnaire, and they were completed on form B with a fill-in-the-blank word or phrase, which was not listed on the questionnaire.

Eight paired-associate nonsense syllables were presented on black and white slides with a slide projector. Twenty-four slides were used for this part of the experiment.

Procedure

Subjects were run in two groups. The first group received the intentional learning treatment condition and the second group received the incidental learning treatment condition. A group consisted of an entire classroom which was randomly divided into the two sub-groups: recognition memory and recall memory. The overall procedure for the intentional learning treatment group consisted of four phases: (a) viewing the slides (b) completing a filler activity (viewing the nonsense syllables) (c) filling out the questionnaire one week later (d) completing the post event questionnaire.

Insert Table 1 about here

The overall procedure for the incidental learning treatment group consisted of four phases: (a) viewing the nonsense syllables (b) completing a filler activity (viewing the 24 color slides) (c) filling out the questionnaire one week later (d) completing the post event questionnaire.

Insert Table 1 about here

The instructions that the intentional learning group received, are as follows: "You will be seeing 48 slides in two groups of 24. The first 24 slides will be a series of color slides depicting a real life event. Pay close attention to the color slides because you will be tested on them later. The second group of 24 slides will be a filler activity consisting of eight paired-associate nonsense syllables. Look at these slides, however, you will not be tested on them."

The instructions that the incidental learning group received, are as follows: "You will be seeing 48 slides in two groups of 24. The first 24 slides will be a series of eight paired-associate nonsense syllables. Your task is to learn to associate the syllable on the right with the syllable on the left. Each of the eight pairs will be shown three times. Pay close attention to the nonsense syllable slides because you will be tested on them later. The second group of 24 slides will be a filler activity depicting a real life event. Look at these slides, however, you will not be tested on them."

Both groups had the respective instructions in front of them and were asked to follow along as the experimenter read them aloud.

Both the incidental learning and the intentional learning treatment condition received the same procedure for the eight paired-associate nonsense syllable task. However, the incidental learning group participated in this activity first, which focused their attention on it, while the intentional learning group viewed these nonsense syllables as their filler activity. Each of the eight paired-associate nonsense syllables were presented for five seconds each. The series of eight nonsense syllables were consecutively presented three times in different orders each time.

Both the intentional learning and the incidental learning conditions viewed a series of 24 color slides depicting a wallet snatching incident. However, the intentional learning group participated in this activity first, which focused their attention on it, while the incidental learning group viewed these slides as their filler activity. Each slide was presented for five seconds

> "The silde sequence opens with a young women walking down a busy street. She meets a friend and stops to talk for a moment. As the woman continues down the street, she is approached by a man wearing a cowboy hat who bumps into her, causing her to drop her shopping bag. The man and woman both stoop to pick up some articles that had fallen out. When the woman is looking the other way, the man reaches into her shoulder bag and takes her wallet. The woman does not notice and the two part. Soon, the victim becomes aware that her red wallet is missing, at which point two other women cross the street toward her and gesture in the direction of the fleeing man" (Loftus, p. 341, 1979a).

After both groups completed their respected filler activities, the regular class resumed. No further details of the experiment were divulged.

One week later from the time that the subject viewed the 24 slides concerning the wallet snatching incident, the subjects filled out the accuracy questionnaire. The two forms of the questionnaire, recognition memory and recall memory, were distributed randomly among the class with an equal number of each form distributed. They were told "Here is a questionnaire that consists of 30 questions on the series of 24 color slides that you saw last week. There are two different forms to the questionnaire, just take one and pass the rest on. There is no time limit on answering the questions. Answer as accurately as possible. If

you are not absolutely sure of the correct answer do not guess at it. I repeat, do not guess at an item unless you are absolutely sure that it is correct. You may begin."

When all of the subjects have completed the questionnaire they were instructed to fill out a post event questionnaire (Appendix F) which served as a manipulation check. When all of the subjects completed both questionnaires they were thoroughly debriefed about the experiment.

Results

A two-factor independent groups analysis of variance was performed on the quantity and the quality of the retention response. The means and the standard deviations for these measures are shown in table 4. The analysis of variance summary tables are presented in Appendices G and H.

The quantity of response was computed as the total number of items answered / the total number of possible items. The F max test for the quantity factor was significant and the variances were not assumed to be homogeneous, F max = 2.66, $p < .05$. The analysis of variance for the quantity of responses presented in Appendix G yielded a non-significant learning X memory interaction, F (1,184) = .19, $p > .05$. The main effects for intentional vs. incidental learning produced an F (1,184) = .67, $p > .05$, which also was nonsignificant. However, the main effects for the recognition vs. recall testing was significant, F (1,184) = 8.86, $p < .05$. Overall, recognition testing (m= 49.04% correct) resulted in a higher level of retention quantity than recall testing (m= 41.17% correct).

The quality of response was computed as the total number of items answered correctly / the total number of items answered. The F max test for the quality factor was non-significant so the variances were assumed to be homogeneous, F max = 2.10, $p > .05$. The analysis of variance for the quality of the response presented in Appendix H yielded a non-significant learning X memory interaction, F (1,184) = 3.81, $p > .05$. The main effect for intentional vs. incidental learning produced an F (1,184) = .0004, $p > .05$, which was non-significant. However, recognition testing (m = 51.53% correct) resulted in a significantly higher level of retention quality than did recall testing (m = 41.98% correct), F (1,184) = 14.54, $p < .05$, was significant.

Pearson product-moment correlations were performed on the quantity and the quality of response for all four conditions (see table 6). All four conditions yielded non-significant correlations at the five percent level.

An item analysis was performed on both questionnaires. Percentages for the correct, the incorrect, and the unanswered items were calculated for all of the four conditions. The recall questionnaires yielded a consistent lower percentage of correct responses and a consistent higher percentage of wrong responses and unanswered items (see Table 3). Percentages for the individual items were also analyzed and showed no significant differences among particular items in a particular treatment condition. But a few items were consistently answered correctly or incorrectly in all treatment conditions (see Appendix E). There was also no evidence of any major trends in the raw data.

A post event questionnaire was used in the study to serve as a manipulation check. The results for the questionnaire can be found in Table 5.

Discussion

The results obtained from the analysis of questionnaire responses reveal that the type of learning, either intentional or incidental, has no influence on the quality of response to an eyewitness account. However, the results did reveal that the enactment of recognition memory yielded a more significant increase in the quantitative and qualititative response to an eyewitness account than was found with recall memory. As was hypothesized, intentional learning did not produce higher quantities of response than incidental learning in both recognition and recall memory, but recognition memory did have a greater quantity of response in the recognition memory condition than in the recall memory condition. Also, there was no learning X memory interaction for either quantity or quality of response. Negative correlations were expected between the quantity and the quality of the responses, but were not found.

There were no differences between intentional and incidental learning. There are both positive and negative aspects to this finding. The negative aspects are that the stated predictions were not correctly confirmed yielding non-significant results. The results are positive because there was no previous research done in the area of eyewitness testimony comparing responses from an intentional learning procedure and an incidental learning

procedure after a one week delay. The conclusion is that people will pay attention to an event and remember as many accurate details whether they are forewarned or if the event occurs without any prior knowledge or instructions to pay attention to the event. The present study enacted the retrieval of details from long-term memory. However, if the subjects were tested immediately after the event, which would have enacted short-term memory, a difference might have been found between intentional and incidental learning. But, that situation is not typical of actual eyewitness testimony in a courtroom situation, which calls upon the retrieval of details from long-term memory.

The results found surrounding the memory conditions, recognition and recall, were both consistent and inconsistent with the hypotheses of the study and past research. The use of recognition memory was superior to recall memory in both learning conditions. When paired with intentional-learning, recognition memory has been found to produce extermely high accuracy and quantity of responses to an eyewitness account. However, it has been found in previous research (Snee & Lush, 1941; Lipton, 1977) that recognition memory yields a higher amount of information reported from an event, but with many incorrect details added; and that recall memory yields less information about an event, but that information is extremely accurate.

In the present study, the recognition memory condition had better quantity and quality responses than the recall memory condition. The finding can be due to the open-ended nature of the recall questionnaire. Some of the questions were so general that

many of the responses were actually correct but were not judged to be correct according to the experimenters' pre-determined correct responses to the items. In addition, the subjects were told not to guess at an item; which seemed to increase the accuracy level found on the recognition questionnaire. A possible explanation for this high accuracy of the recognition questionnaire could be due to the suggestible nature of it. Each question had six possible rejoinders out of which one was correct, while the recall questions did not have any rejoinders, just a fill-in-the-blank. The subjects were told not to guess and to be absolutely sure the answer was correct on both of the questionnaires, but the suggestion of a correct answer that was found on the recognition questionnaire might have helped the retrieval process and helped to increase the confidence level of the accuracy of that response.

The quantity and quality of testimony to an eyewitness event were not found to be negatively correlated as was found in a previous study (Lipton, 1977). All the correlations were negative, but were not significant. The conclusion was drawn stating that the recognition memory questionnaire was more suggestible and gave the subject a greater feeling of confidence when deciding upon the accuracy of an item than the recall questionnaire was. The finding can also mean that recognition memory is a more accurate means of obtaining the most information when questioning a witness about an event which occured prior to the questioning. Previous research (Lipton, 1977) questioned subjects immediately after the witnessing of an event. The questioning was also in both a recognition

method and a recall method for measuring the quantity and the quality of responses. Lipton (1977) found a negative correlation between the quantity and quality where the greater the quantity of testimony that is reported the less accurate it becomes. The nature of the two questionnaires that were used in the present study combined with the specific instructions to respond only when absolutely certain, are possible explanations why the negative correlations were not significant.

The post-event questionnaire was used an a manipulation check in this study (see Table 5). From an analysis of the results, question number five apperas to show the most interesting finding. Of the subjects in the intentional learning group, only 64% felt that they would be tested on only the color slides when specific instructions were given to them which stated that they would be tested on the color slides only. While only 40% of the subjects in the incidental learning condition thought that they would be tested on what was actually told to them. Thirty percent of the intentional group and 42% of the incidental group felt that they would be tested on both groups of slides, contrary to the instructions; could be possible explanations for the results that were obtained between the two learning conditions. Seventy-two percent of the subjects thought that they would be tested on both sets of slides which helps to support the finding that both learning situations remembered and reported the same amount of information and the same quality of information. Many subjects commented on the post-event questionnaire that they tried to learn

both sets of slides because the study took place during the regular class period. It was expressed that even though the experimenter designated for each group which set of slides that they would be tested on, many still felt that they would be tested on both. These comments also help to explain the lack of difference that was found between the two learning conditions.

The results that were found from the item analysis give more support to the findings concerning the two different questionnaires (see Appendix E, Table 3). The recall questionnaire seemed to be much harder to answer items correctly. Many items were consistently wrong or unanswered (items # 11,12,17,18,19,22,23,26,and 28) or consistently answered correctly (items # 3 and 20) on both questionnaires. An explanation for the statement that the items were consistently answered incorrectly on the recall questionnaire is that the particular response which was pre-determined as the only accurate response was a very detailed response to a very general question. The items which were always answered correctly on both questionnaires dealt with the construction material of a city street, and a major detail of the main character, which was the focus for two consecutive slides. The finding is consistent with other findings (Loftus, 1979a, 1979b) that the more exposure a witness has to an event or detail of an event the more likely they are to remember that detail. However, since these two particular items are being answered correctly by all the subjects, further use of the questionnaires should delete the two items because they do not aid the discrimination of a good eyewitness. Question 19 was the

only one which incorporated false information and was unanswered by 81% of the total subjects who answered the recall questionnaire. While 81% did not answer, the other 19% answered incorrectly. All of the subjects who did answer, were fooled by the false information. Of the subjects who were in the recognition memory condition, 90% did not answer, while 5% who did were correct and 5% incorrect. The subjects were not fooled very easily in the present study with the introduction of false information, as was shown in the responses to item # 19. Another finding from the item analysis is that clothing or details, which were highly visible, were remembered most often while ordinary hairstyles and colors of items were missed most often.

The effect that intentional learning and incidental learning has on the memory of an eyewitness account should be researched further. The present study found no differences, however other variables which were mentioned could have eliminated any possible differences. The present study should be repeated in either the same conditions or in different conditions to support or refute the findings from this study regarding intentional and incidental learning with recognition and recall memory. Since the amount of research investigating the differences between intentional and incidental learning is minimal in eyewitness testimony, researchers should study this area thoroughly. There actually may be no difference between the two types of learning, as was found in this study, but future investigators will add significant strength to any conclusions which will be drawn. Further research also needs

to be done with different populations of subjects to obtain more information from a cross section of people. College students are constantly being tested and observed in all areas of study, so it was only natural for many of the subjects in the present study to have paid close attention to everything that was going on around them regardless of the specific directions concerning what needed to be attended to. The use of slides in future research instead of a real incident or film decreases the real-life nature of the event. As a result future research in the area should try to assimilate an eyewitness event, which is as natural as possible, with other things happening simultaneously to insure that attention will not be solely focused on the event whether it is filmed, slides, or a staged event. Continuation of research in the area of eyewitness testimony must be for the purpose of finding individual factors that might relate to the quality and the quantity of eyewitness testimony. The value of future research can help to increase our knowledge of the characteristics which can discriminate a good witness from a bad witness.

References

Allport, G.W. & Postman, L.J. The psychology of rumor. In R. Buckout Eyewitness Testimony. Scientific American, 1974, 231, 23-31.

Baltes, P.B. & Schaie, K.W. On the plasticity of intelligence in adulthood and old age. American Psychologist, 1976, 31, 720-725.

Bird, C. The influence of the press upon the accuracy of report. Journal of abnormal and social psychology, 1927, 22, 123-129.

Buckout, R. Eyewitness Testimony. Scientific American, 1974, 231, 23-31.

Cady, H.M. On the psychology of testimony. American journal of psychology, 1924, 35, 110-112.

Clifford, B,R, & Scott, J. Individual and situational factors in eyewitness testimony. Journal of psychology, 1978, 63, 352-359.

Ellis, H.J., Sheperd, J., & Bruce A. The effects of age and sex upon adolescents' recognition of faces. In E. Loftus, Eyewitness Testimony. Massachusetts: Harvard University press, 1979.

Goldstein, A.G. & Chance, J. Recognition of childrens faces. Child development, 1964, 35, 129-136.

Goldstein, A.G. & Chance, J. Recognition of childrens faces II. Perceptual and motor skills, 1965, 20, 548-549.

Johnson, C. & Scott B. Eyewitness testimony and suspect identification as a function of arousal, sex of witness, and scheduling of interrogation. In E. Loftus, Eyewitness Testimony, Massachusetts: Harvard University press, 1979.

Kagan, J.R., Klein, E., Haith, M.M., & Morrison, F.J. Memory and meaning in two cultures. Child development, 1973, 44, 221-223.

Laughery, K.R., Alexander, J.E., & Lane, A.B. Recognition

of human faces: effects of target exposure time, target position, pose position, and type of photograph. Journal of applied psychology, 1971, 55, 477-483.

Lerch, S. Field Dependence as a factor in eyewitness accounts. 1981, unpublished masters thesis.

Lipton, J.P. On the psychology of eyewitness testimony. Journal of applied psychology, 1977, 62, 90-93.

Loftus, E.F. Leading questions and the eyewitness report. Cognitive psychology, 1975, 7, 560-572.

Loftus, E.F. Eyewitness testimony. Massachusetts: Harvard University press, 1979a.

Loftus, E.F. The malleability of human memory. American Scientist, 1979b, 67, 312-320.

Loftus, E.F., Miller, D.G., & Burns, H.J. Semantic integration of verbal information into a visual memory. Journal of experimental psychology, 1978, 4, 19-31.

Marshall, J. Law and psychology in conflict. In E.F. Loftus, Eyewitness testimony, Massachusetts: Harvard University press, 1979.

Marquis, K.H., Marshall, J., & Oskamp, S. Testimony validity as a function of question form, atmosphere, an item difficulty. Journal of applied social psychology, 1972, 2, 167-186.

Marshall, J. Marquis, K.H., & Oskamp, S. Effects of kind of question and atmosphere of interrogation on accuracy and completeness of testimony. Harvard law review, 1971, 84, 1620-1643.

McKelvie, S. The effects of verbal labeling on recognition memory for schematic faces. Quarterly journal of experimental psychology, 1976, 28, 459-474.

Mueller, J.H., Bailis, K.L., & Goldstein, A.G. Depth of processing and anxiety in facial recognition. In E.F. Loftus, Eyewitness testimony, Massachusetts: Harvard University press, 1979a.

Palmer, S.E. Visual perception and world knowledge: Notes on a model of sensory cognitive interaction. In R.L.Solso, Cognitive psychology, New York/ San Diego/ Atlanta: Harcourt Brace Jovanovich, inc., 1979.

Powers, P.A., Andriks, J.L., & Loftus, E.F. The eyewitness accounts of femals and males. Journal of applied psychology, 1979, 64, 339-347.

Sarason, I.G., Johnson, J.H., & Siegel, J.M. Assessing the impact of life change: the development of the life experiences survey. Journal of consulting and clinical psychology, 1978, 46, 932-946.

Sarason, I.G., & Stoops, R. Test anxiety on the passage of time. Journal of consulting and clinical psychology, 1978, 46, 102-108.

Schaie, K.W. & Gribbin, K. Adult development and aging. Annual review of psychology, 1975, 26, 65-96.

Siegel, J.M. & Loftus, E.F. Impact of anciety and life stress upon eyewitness testimony. Bulletin of the psychonomic society, 1978, 12, 479-480.

Snee, T.J. & Lush, D.E. Interaction of the narrative and interrogatory methods of obtaining testimony. Journal of psychology 1941, 11, 229-236.

Solso, R.L. Cognitive psychology, New York/ San Diego/ Atlanta: Harcourt Brace Jovanovich, inc., 1979.

Thorson, G. & Hochhaus, L. The trained observer: effects of prior information on eyewitness reports. In E.F. Loftus, Eyewitness testimony, Massachussetts: Harvard University press, 1979.

Tickner, A.H. & Poulton, E.C. Watching for people and actions. In E.F. Loftus, Eyewitness testimony, Massachussetts: Harvard University press, 1979.

Wittroyl, S. & Kaess, W. Sex differences in social memory tasks. Journal of abnormal and social psychology, 1957, 54, 343-346.

Woodhead, M.M., Baddeley, A.D. & Simmonds, D.C. On training people to recognize faces. In E.F. Loftus, Eyewitness testimony, Massetts: Harvard University press, 1979.

Appendix A

INFORMED CONSENT FORM

I, _____, agree to participate in this study. I understand that I will be taking a test based on a series of slides that I will be viewing. The test will pose no physical or psychological risk for me. The experiment will be divided into two parts and I understand that I must participate in both parts. Both parts combined should take about 20 minutes of class time.

I understand that Jill Ricke, a graduate student in the Psychology Department at the University of Richmond, will be administering the test, I know that I am volunteering for her study, and that I may quit at any time. I also understand that I will receive no research credit since this project is conducted in class. My participation or lack of participation will in no way affect my status in school. I further understand that the results of the task will be kept confidential. My name will not be used in any report of this study.

_____ _____

Date Signature

Appendix B

Paired-Associate Nonsense Syllables

JAL - DOK

TIB - GAF

BAW - NUL

SEK - CUZ

WUF - KEM

YIP - HEV

VOG - TAQ

ROZ - QUIN

Intentional	Incidental
view 24 wallet snatching incident slides 2 min.	view nonsense syllable pairs, 3 times - different order 2 min.
filler activity: nonsense syllables, 3 times - different order 2 min.	filler activity; view 24 wallet snatching incident slides 2 min.
one week later	one week later
fill out questionnaire	fill out questionnaire
recognition recall	recognition recall
post event questionnaire	post event questionnaire

Table 1. Experimental Procedure

Type of Learning

Type of Memory	Intentional	Incidental
Recognition	n = 47	n = 47
Recall	n = 47	n = 47

Table 2. Experimental Design

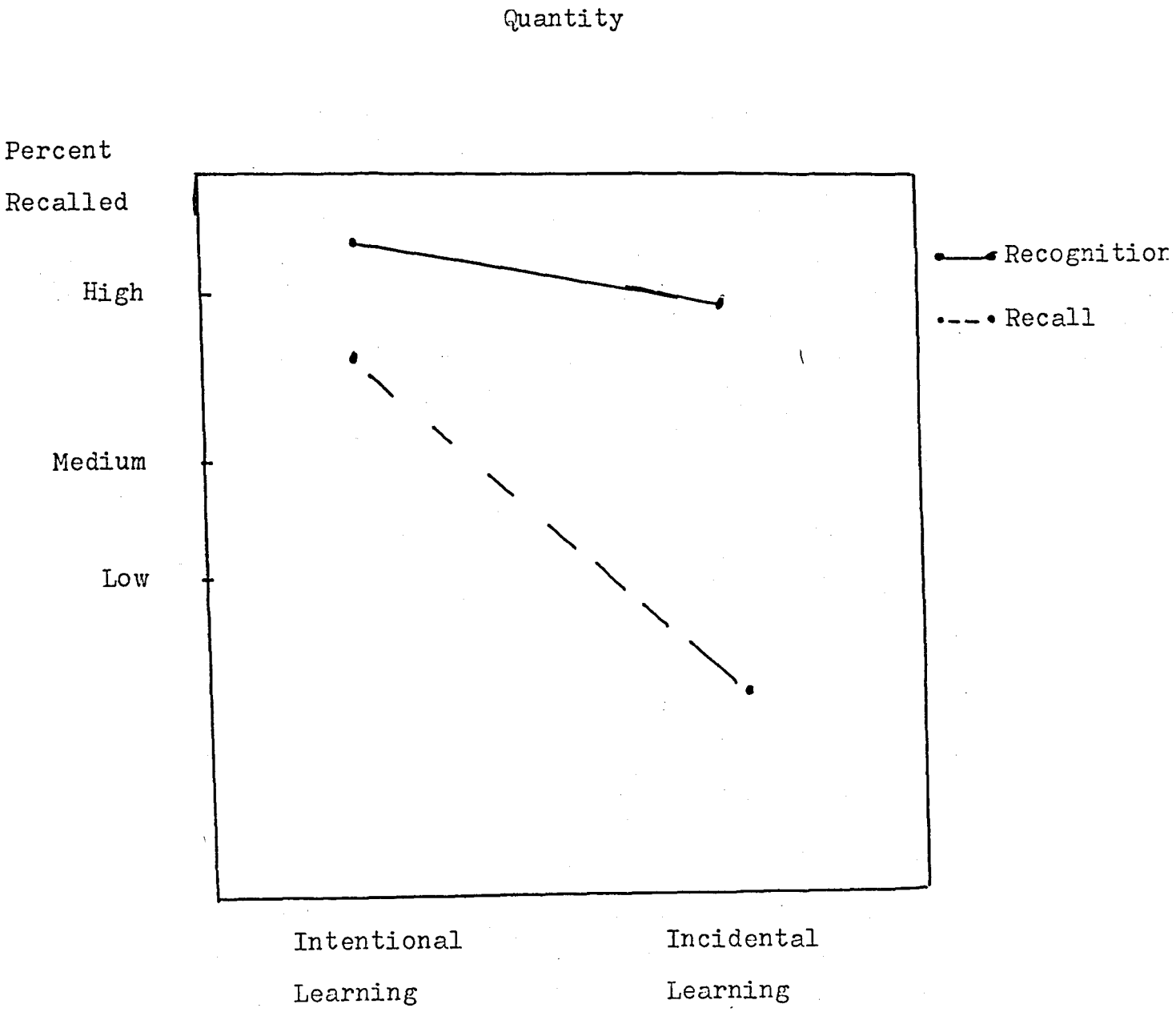

Figure 1. Anticipated results between type of learning and type of memory for the quantity measure

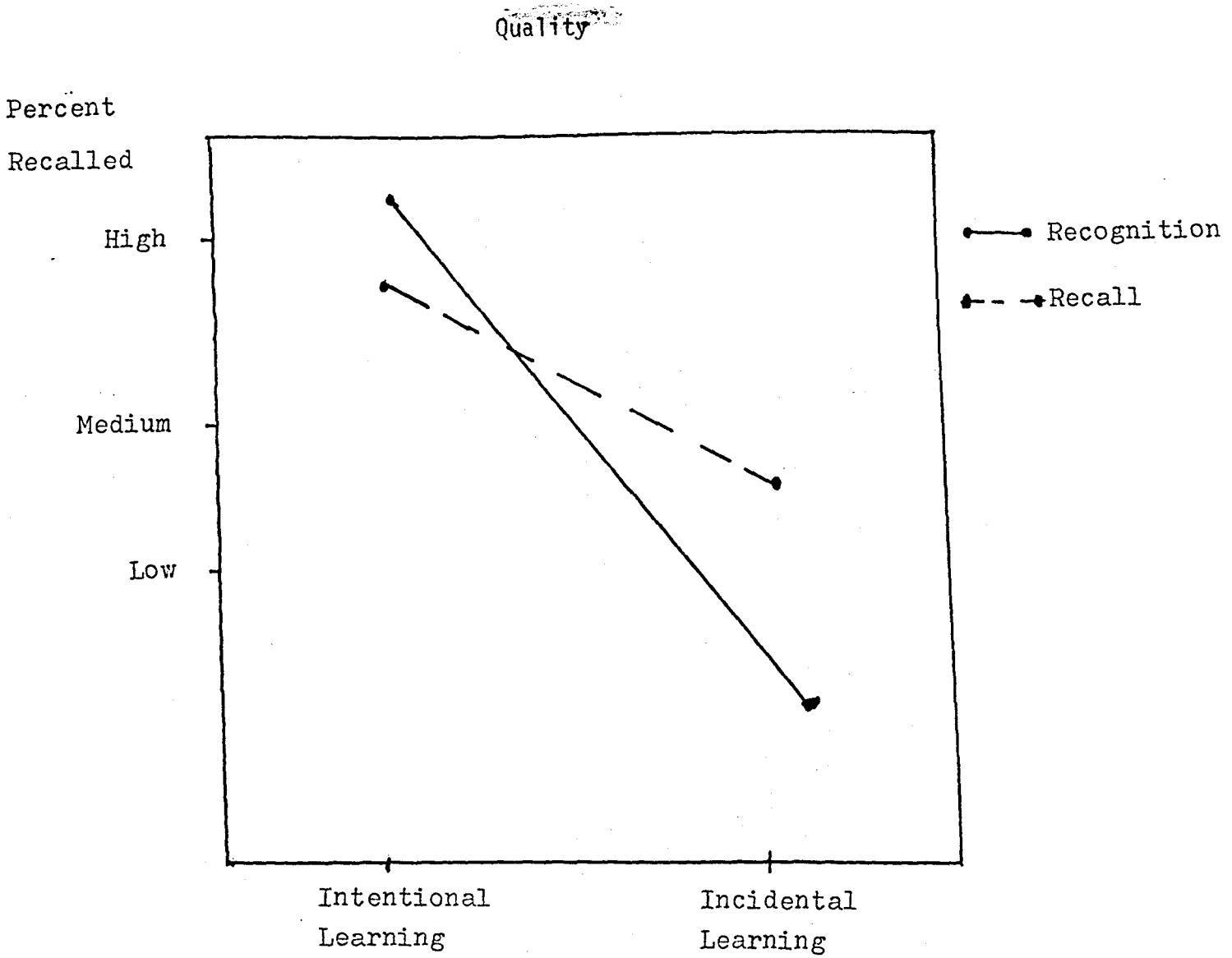

Figure 2. Anticipated results between type of learning and type of memory for the quality measure

Appendix C

Form A Questionnaire

Do not guess at an item. If you are not sure of the answer circle letter "F" "don't remember".

1. The victim of the wallet snatching was wearing a brown:
   a. jacket
   b. hat
   c. shoulder bag
   d. sweather
   e. scarf
   f. don't remember

2. The action in the slides took place:
   a. on the main street of a big city
   b. on a side street of a big city
   c. on a main street of a small town
   d. in a residential area of a small town
   e. in the suburbs
   f. don't remember

3. After the thief took the wallet, he put it:
   a. in an outside jacket pocket
   b. in his hip pocket of his pants
   c. in a side pocket of his pants
   d. inside his jacket
   e. none of the above
   f. don't remember

4. The victim met her friend:
   a. as she (the victim) was waiting to cross the street
   b. as she was walking down the sidewalk
   c. while she was looking in a store window
   d. as she was picking up her dropped packages
   e. as she was waiting for a bus
   f. don't remember

5. The victim had _____ hair.
   a. short, light colored
   b. long, light colored
   c. short, dark
   d. long, dark
   e. red
   f. don't remember

6. The thief was wearing:
   a. Adidas tennis shoes
   b. brown loafers
   c. open sandals
   d. black boots
   e. tan suede shoes
   f. fon't remember

7. The store buildings seen in the slides were:
   a. painted white
   b. brick
   c. natural wood
   d. concrete blocks
   e. gray stone
   f. don't remember

8. The victim's shopping bag was:
   a. brown
   b. yellow
   c. white
   d. blue
   e. gray
   f. don't remember

9. One eyewitness was wearing:
   a. a straw hat
   b. a velvet beret
   c. a wool ski cap
   d. a scarf
   e. none of the above
   f. don't remember

10. The man who took the wallet had:
    a. a beard
    b. a mustache
    c. a beard and a mustache
    d. long hair
    e. none of the above
    f. don't remember

11. As the victim was first walking down the main street, on the sidewalk behind her was:
    a. an old woman
    b. a boy on a skateboard
    c. a girl with a dog
    d. a boy on a bicycle
    e. another woman
    f. don't remember

12. On the back of the thief's jacket there was:
    a. an embroidered design
    b. an American flag
    c. a number printed
    d. a word printed
    e. nothing
    f. don't remember

13. The victim was wearing:
    a. prescription eyeglasses
    b. "mirror" type sunglasses
    c. lightly tinted sunglasses
    d. dark sunglasses
    e. none of the above
    f. don't remember

14. On display in the store window there was:
    a. furniture
    b. stationary
    c. clothing
    d. toys
    e. hardware
    f. don't remember

15. The color of the thief's jacket was:
    a. brown
    b. beige
    c. black
    d. green
    e. navy blue
    f. don't remember

16. The victim was wearing:
    a. a sweater
    b. a shawl
    c. a light jacket
    d. a raincoat
    e. a winter coat
    f. don't remember

17. The thief waited to crosss the street while a _____ went by.
    a. taxi
    b. pick-up truck
    c. station wagon
    d. Volkswagon
    e. sports car
    f. don't remember

18. The two eyewitnesses across the street were standing in front of:
    a. an office building
    b. a store
    c. a restaurant
    d. a tavern
    e. a post office
    f. don't remember

19. The victim's friend's shoulder bag was:
    a. white
    b. beige
    c. brown
    d. black
    e. she didn't have one
    f. don't remember

20. The sidewalk where the incident took place was:
    a. brick
    b. cobblestone
    c. asphalt
    d. concrete
    e. dirt
    f. don't remember

21. The predominant color of the victim's friend's outfit was:
    a. navy blue
    b. yellow
    c. green
    d. rust
    e. black
    f. don't remember

22. The shawls worn by the two eyewitnesses were:
    a. blue and yellow
    b. red and green
    c. brown and red
    d. black and beige
    e. white and green
    f. don't remember

23. After the thief took the wallet and was walking away:
    a. he passed a store window
    b. he glanced in a window as he passed it
    c. he stopped and looked in a window
    d. he passed a person looking in a window
    e. he didn't pass a store window
    f. don't remember

24. The thief wore a:
a. cowboy hat
b. derby
c. beret
d. bandana
e. none of the above
f. don't remember

25. How many store windows did the victim either pass or look into:
a. one
b. two
c. three
d. four
e. none
f. don't remember

26. The victim's friend was carrying:
a. a newspaper
b. a shopping bag
c. a notebook
d. an umbrella
e. none of the above
f. don't remember

27. Were any of the women in the slide series wearing a skirt? If so, who?
a. no
b. the victim
c. one of the eyewitnesses
d. the victim's friend
e. the victim and her friend
f. don't remember

28. How many small plastic items fell out of the victim's shopping bag?
a. one
b. two
c. three
d. four
e. five or more
f. don't remember

29. The two eyewitnesses caught the attention of the victim after the crime occurred by:
a. yelling at her
b. running across the street in front of her
c. yelling and waving at her
d. quietly catching up with her, then discreetly gaining her attention
e. honking the horn of their car
f. don't remember

30. As the victim and the thief were saying goodbye:
    a. they both waved
    b. she waved to him
    c. he waved to her
    d. he tipped his hat
    e. none of the above
    f. don't remember

Appendix D
Form B Questionnaire

Do not guess at an item. If you are not sure of the answer, leave it blank.

1. The victim of the wallet snatching was wearing a brown shoulder bag.

2. The action in the slides took place on a main street in a small town.

3. After the thief took the wallet, he put it inside his jacket.

4. The victim met her friend as she was walking down the sidewalk.

5. The victim had long, dark hair.

6. The thief was wearing black boots on his feet.

7. The store buildings seen in the slides were constructed of brick.

8. The color of the victim's shopping bag was white.

9. One eyewitness was wearing a straw hat on her head.

10. A physical characteristic of the man who took the wallet was a mustache.

11. As the victim was first walking down the main street, on the sidewalk behind her was a boy on a bicycle.

12. On the back of the thief's jacket, there was a word printed.

13. The victim was wearing dark sun glasses.

14. On display in the store window, there was clothing.

15. The color of the thief's jacket was navy blue.

16. The victim was wearing a light jacket on her upper body.

17. The thief waited to cross the street while a station wagon went by.

18. The two eyewitnesses across the street were standing in front of an office building.

19. The color of the victim's friend's shoulder bag was she didn't have one.

20. The sidewalk where the incident took place was constructed of concrete (cement).

21. The predominant color of the victim's friend's outfit was rust (red).

22. The two colors of the shawls worn by the two eyewitnesses were red and green.

23. After the thief took the wallet and was walking away he passed a store window.

24. The thief wore a cowboy hat on his head.

25. How many store windows did the victim either pass or look into? 2

26. The victim's friend was carrying a notebook.

27. Were any of the women in the slide series wearing a skirt? If so, who? no

28. How many small plastic items fell out of the victim's shopping bag? 5 or more

29. The two eyewitnesses caught the attention of the victim after the crime occurred by quietly catching up with her, then discreetly gaining her attention.

30. What did the victim and thief do while they were saying goodbye? (V) She waved to him (Thief)

Appendix E

	Intentional Recall						Incidental Recall					
	Correct		Wrong		Unanswered		Correct		Wrong		Unanswered	
	#	%	#	%	#	%	#	%	#	%	#	%
1.	2	4	15	32	30	64	5	11	17	36	25	53
2.	10	21	30	64	7	15	15	32	24	51	8	17
3.	40	85	2	41	5	11	42	89	2	4	3	6
4.	4	8	29	62	14	30	6	13	28	60	13	28
5.	0	0	35	74	12	26	0	0	31	66	16	34
6.	15	32	10	21	22	47	14	30	9	19	24	51
7.	25	53	4	9	18	38	21	45	3	6	23	49
8.	4	9	20	42	23	49	2	4	17	36	28	60
9.	1	2	8	17	38	81	0	0	11	23	36	77
10.	8	17	22	47	17	36	5	11	27	57	15	32
11.	0	0	6	13	41	87	0	0	9	19	38	81
12.	0	0	4	9	43	91	3	6	4	9	40	85
13.	3	6	20	43	24	51	20	43	3	6	24	51
14.	4	9	7	15	36	76	7	15	3	6	37	79
15.	15	32	16	34	16	34	14	30	15	32	18	38
16.	8	17	12	26	27	57	8	17	11	23	28	60
17.	0	0	17	36	30	64	1	2	23	49	23	49
18.	0	0	10	21	37	79	0	0	1	15	40	85

Appendix E

Intentional Recall

	Correct		Wrong		Unanswered	
	#	%	#	%	#	%
19.	0	0	7	15	40	85
20.	29	62	3	6	15	32
21.	4	9	8	17	35	74
22.	0	0	5	11	42	89
23.	1	2	18	38	28	60
24.	13	28	9	19	25	53
25.	3	6	6	13	38	81
26.	0	0	10	21	37	79
27.	6	13	6	13	35	74
28.	1	2	3	6	43	91
29.	6	13	6	13	35	74
30.	12	26	5	10	30	64

Incidental Recall

Correct		Wrong		Unanswered	
#	%	#	%	#	%
0	0	11	23	36	77
31	66	0	0	16	34
7	15	10	21	30	64
2	4	4	9	41	87
0	0	26	55	21	45
8	17	13	28	26	55
4	9	13	28	30	63
0	0	12	26	35	74
9	19	7	15	31	66
1	2	4	9	42	89
2	4	12	26	33	70
7	15	13	28	27	57

Appendix E

	Intentional Recognition						Incidental Recognition					
	Correct		Wrong		Unanswered		Correct		Wrong		Unanswered	
	#	%	#	%	#	%	#	%	#	%	#	%
1.	16	34	8	17	23	49	14	30	11	23	22	47
2.	26	55	17	36	4	9	27	57	15	32	5	11
3.	40	85	4	9	3	6	41	87	2	4	4	9
4.	21	45	16	34	10	21	19	40	19	40	9	19
5.	11	23	17	36	19	41	9	19	20	43	18	38
6.	9	19	7	15	31	66	11	23	4	9	22	47
7.	26	55	5	11	16	34	20	43	3	6	24	51
8.	5	11	12	25	30	64	3	6	20	43	24	51
9.	3	6	10	21	34	72	3	6	10	21	34	72
10.	20	43	15	32	12	25	29	62	9	19	9	19
11.	0	0	9	19	38	81	2	4	6	13	39	83
12.	4	9	23	49	20	42	6	13	21	45	20	42
13.	10	21	11	23	26	56	5	11	17	36	25	53
14.	22	47	1	2	24	51	13	28	6	13	28	59
15.	17	36	17	36	13	28	9	19	17	36	21	45
16.	8	17	19	40	20	43	11	23	22	47	14	30
17.	0	0	5	11	42	89	0	0	3	6	44	94
18.	3	6	7	15	37	79	3	6	7	15	37	79

Appendix E

	Intentional Recognition						Incidental Recognition					
	Correct		Wrong		Unanswered		Correct		Wrong		Unanswered	
	#	%	#	%	#	%	#	%	#	%	#	%
19.	3	6	3	6	41	87	0	0	3	6	44	94
20.	44	94	1	2	2	4	37	79	4	9	6	12
21.	6	13	7	15	34	72	5	11	6	13	36	76
22.	2	4	5	11	40	85	5	11	2	4	40	85
23.	3	6	11	23	33	70	2	4	14	30	31	64
24.	23	49	13	28	11	23	18	38	13	28	16	34
25.	8	17	15	32	24	51	4	8	6	13	37	79
26.	0	0	14	30	33	70	0	0	14	30	33	70
27.	9	19	5	11	33	70	4	9	7	15	36	76
28.	4	9	3	6	40	85	9	19	4	9	34	72
29.	14	30	18	38	15	32	14	30	13	28	20	42
30.	6	13	17	36	24	51	6	13	25	53	16	34

	Recognition			Recall		
	correct	incorrect	unanswered	correct	incorrect	unanswered
entional	26%	22%	52%	15%	25%	60%
idental	23%	23%	54%	17%	26%	57%

TABLE 3: Item analysis questionnaire-percentages

Quantity %'s

	Recognition	Recall	
Intentional	m = 48.53 s = 14.00	m = 39.51 s = 18.69	m = 44.02
Incidental	m = 49.55 s = 15.76	m = 42.83 s = 22.83	m = 46.19
	m = 49.04	m = 41.17	

Quality %'s

	Recognition	Recall	
Intentional	m = 54.00 s = 17.10	m = 39.57 s = 17.64	m = 46.78
Incidental	m = 49.06 s = 13.60	m = 44.40 s = 19.17	m = 46.73
	m = 51.53	m = 41.98	

Table 4
Means and Standard Deviations

Appendix F

Post Experiment Questionnaire

1. What did you feel was the purpose of the experiment?

2. What did you think the hypothesis was (i.e., what did you think we were looking for, trying to study, etc.)?

3. What did you think was the purpose for the one week delay before completing the questionnaire?

4. Did you think that you would be tested at a later date?

5. Did you think that you would be tested on the color slides, nonsense syllables, or both?

_____ Date

_____ Name

_____ Major

_____ Signature

INCIDENTAL LEARNING

QUESTION	PERCENTAGES
1	74% = memory, attention, forgetting or learning 18% = other reasons 8% = did not know
2	60% = memory, details, forgetting 12% = other reasons 18% = did not know
3	74% = delay was for the purpose of memory and forgetting 12% = other reasons 14% = did not know
4	60% = yes, would be tested later 17% = no, would not be tested later 11% = did not know
5	11% = color slides only 40% = nonsense syllable slides only 42% = both color slides and nonsense syllables 7% = did not know
6	47% = majors other than psychology 13% = psychology majors 40% = undecided majors

TABLE 5

Post Event Questionnaire percentages

INTENTIONAL LEARNING

QUESTION	PERCENTAGES
1	80% = memory, attention, forgetting or learning 14% = other reasons 6% = did not know
2	66% = memory, details, forgetting 20% = other reasons 14% = did not know
3	72% = delay was for the purpose of memory and forgetting 26% = other reasons 2% = did not know
4	65% = yes; would be tested later 28% = no, would not be tested later 7% = did not know
5	64% = color slides only 2% = nonsense syllable slides only 30% = both color slides and nonsense syllables 4% = did not know
6	71% = majors other than psychology 4% = psychology majors 25% = undecided majors

TABLE 5

Post Event Questionnaire Percentages

Appendix G

Analysis of Variance - Quantity

Source	df	ms	F	P
Total	187			
Between learning	1	221.36	.67	ns
Between memory	1	2912.76	8.86	.05
Learning X memory	1	62.05	.19	ns
Error	184	328.75		

Appendix H
Analysis of Variance - Quality

Source	df	ms	F	P
Total	187			
Between learning	1	.13	.0004	ns
Between memory	1	4279.84	14.54	.05
Learning X memory	1	1120.64	3.81	ns
Error	184	294.27		

	Recognition	Recall
entional	$r = -.27$, $p > .05$ n.s.	$r = -.13$, $p > .05$ n.s.
cidental	$r = -.28$, $p > .05$ n.s.	$r = -.18$, $p > .05$ n.s.

TABLE 6

Pearson Product Moment Correlations