

To the Graduate Council:

I am submitting herewith a dissertation written by Cheryl K. Webb entitled "The Relationship Between Suggestibility of Memory and Personality." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

Connie Steele

Connie Steele, Major Professor

We have read this dissertation
and recommend its acceptance:

Alvarado H. Tizano

Joe M. [Signature]

Schuyler W. Duck

Accepted for the Council:

C. W. Mink

Associate Vice Chancellor and
Dean of The Graduate School

THE RELATIONSHIP BETWEEN SUGGESTIBILITY OF MEMORY
AND PERSONALITY

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Cheryl K. Webb

December 1994

DEDICATION

This dissertation is dedicated to my parents,
Danny and Carolyn Webb,
whose love and support made this achievement possible.

ACKNOWLEDGEMENTS

I would like to thank me committee for their enthusiasm and suggestions. My chairperson, Connie Steele, worked on this dissertation with a great passion, extending far beyond what should be expected. Connie should also be credited with not only helping me to continue my graduate studies but also offering invaluable experiences throughout my course of study. I would also like to thank my other committee members, Schuyler Huck, James D. Moran, III, and Deborah W. Tegano, for their support of this endeavor.

I would like to acknowledge the students who worked on this research project. I would like to thank Jackie Smith for scoring the personality assessments. Her husband should also be acknowledged for developing a computer program for scoring the tests. I would also like to thank Kirstin Fryer and Melody Watson for conducting the interrater reliability for the memory and suggestibility questionnaires.

ABSTRACT

The current study investigated the relationship between suggestibility of memory and various personality characteristics identified by the Millon Index of Personality Traits (Millon, 1994). An experimental design was used. Subjects (N=101) were assigned to either an experimental group, receiving the suggestive information, or a control group. Suggestibility of memory was measured by the Lindberg Suggestibility Assessment (1991). This measure consisted of a short video followed by an initial questionnaire to assess memory and a second administration one week later. The initial questionnaire offered suggestive misinformation to the experimental group. The second questionnaire measured both memory and suggestibility. Logistic regression analyses constructed a model of the personality characteristics that are predictive of suggestibility on two of the memory questionnaire items. The personality traits found to be predictive are described and explanations are considered. Findings of the present study are discussed in terms of the potential theoretical implications.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	3
The Memory Process	4
Suggestibility	9
Personality	14
Suggestibility and Personality	16
III. METHODOLOGY	21
Research Design	21
Subjects	22
Instrumentation	24
Procedure	34
Rationale for the Present Study.....	35
IV. RESULTS	38
Descriptive Information.....	38
The Memory Questionnaire.....	39
V. DISCUSSION AND CONCLUSION	55
LIST OF REFERENCES	65
APPENDIXES	70
APPENDIX A. CONSENT FORM	71
APPENDIX B. PERSONAL DATA QUESTIONNAIRE	73
APPENDIX C. MEMORY QUESTIONNAIRE	76
APPENDIX D. AMBIGUITY TOLERANCE QUESTIONNAIRE	83
VITA	86

CHAPTER I

INTRODUCTION

Suggestibility of memory has become a popular topic over the last 15 years (Ceci & Bruck, 1993). The ability of an eyewitness to perceive, remember, and report accurately a witnessed event has received a great deal of attention from experimental psychologists and the legal system.

Suggestibility has been typically assessed as susceptibility to misleading information using an information-processing model. Though the recall of a remembered event (i.e., eyewitnessing) is inherently an act of cognition, this act is embedded in a complex and often confusing social context.

The present study considers how the cognitive processes of memory and the social characteristics of personality may relate. According to the eyewitness paradigm, memory involves not only remembering but also an understanding of the context in which the memory occurs and the potential influence of this memory on others. Although personality is conceptually recognized as affecting the memory of an eyewitness, there is little empirical literature that has investigated the relationship between the cognitive process of memory and the social context that contains characteristics of personality.

This study described the memory process from the context of social development (Rogoff, 1990). The relationship between suggestibility of memory and personality types was investigated. The following questions were addressed: Do people vary in the accuracy with which they perceive and recall complex events to which they have been witnesses? How much do people vary in suggestibility? To what extent do people come to accept postevent misleading information and incorporate it into their recollections? Is such variation related to differences in personality styles? This study did not investigate the relationship between personality and the repressed memories of abuse contexts.

There are theoretical as well as potential practical implications as possible outcomes of this study. The theoretical implications include the development of a comprehensive framework from which it may be possible to predict susceptibility to suggestibility. If subject characteristics can be identified for adults, future research could investigate the relationship of these variables to children's suggestibility of memory. On the practical side, the framework of personality styles as related to one's suggestibility would be used to alter present interviewing techniques. Those individuals possessing the personality variables conducive to suggestibility may need additional considerations in the process of obtaining eyewitness accounts.

CHAPTER II

REVIEW OF LITERATURE

In the 1980s, the research concerning eyewitness testimony received a great deal of interest. Within this area, the influence of suggestibility on memory has become a major issue. Developmental studies have concluded that children are more suggestible than adults (Cohen & Harnick, 1980; King & Yuille, 1987; Ceci, Ross, & Toglia, 1987). Studies have also supported the idea that adults too can be vulnerable to suggestion (Loftus, 1979b; Ward & Loftus, 1985). Although a great deal of attention has been focused on the developmental differences between children and adults, little focus has been given to determining the conditions under which a person is more susceptible to suggestion.

The major purpose of this study was to answer the question: Can suggestibility be shown to be related to attributions of personality? In other words, do specific personality characteristics indicate a predisposition to include suggestions in remembered events?

A conceptual foundation for this study is presented in the following sections. First, the theoretical perspective used for understanding the memory process is presented.

Second, the literature defining suggestibility of memory is reviewed. Next, the research studies that have investigated the relationship between suggestibility and personality is discussed. This review emphasizes the lack of empirical research on the attributions of personality that may be related to suggestibility of memory. The final section provides a brief reference to the theoretical basis of the various parts of the personality test used in this study. This description gives the reader an overview of both the conceptual and operational definitions of the various personality characteristics assessed. A rationale for the selection of this instrument is discussed.

The Memory Process

The issue of memory is of central concern for understanding the underlying mechanisms of suggestibility. To what degree does postevent information interfere with the original memory? This question is founded on the cognitive process of memory. To respond accurately to the central details of an event is dependent upon the memory process. From an eyewitnessing paradigm, a great deal of research has been concerned with the accurate memory of various witnessed events. Typically, in these studies, there is a presentation of a misleading postevent suggestion that is assumed to interfere with the memory of the event. A framework of information-processing is used here to describe

the complex construct of memory.

In the area of eyewitness memory, the accurate recall of an event is of primary concern. Often, individuals are asked to remember the details of an important event, such as an accident or crime. A study by Ward and Loftus (1985) illustrates the critical role of accurate memory in the investigation of suggestibility. Accuracy on critical items is not the same mental response as accepting the suggestive misinformation as a correction of memory and, thus, responding incorrectly. In this study, suggestibility was operationalized as incorrectly responding to a question. Further, the research on suggestibility of memory indicates that it has a strong connection with the accurate memory of the details of an event.

An information-processing perspective may be used to illustrate the complex process of remembering an event. When an event is experienced, it is not placed into memory as a videorecorder would record the event (Loftus, 1979a). Only the input stimuli (i.e., the event) and the output behavior (i.e., the remembered information or actions) are directly observable (Thomas, 1992). "Only in information-processing is there an attempt to specify how stimuli are manipulated and transformed, in sequence, to produce a particular response" (Kail & Bisanz, 1992).

Upon experiencing an event, an individual selects some of the features to be stored in memory, while ignoring

others. The selection of features is dependent upon how the information was received from the environment; for example, the individual selects the aspects on which to focus attention (Loftus, 1979a). In other words, there is an assumption of individual differences in the interpretation of how they perceive and remember an event. The conception of perception, in which the attentional focus is embedded, permeates all steps of the information-processing model (Thomas, 1992). To illustrate this point, it is crucial for the witness to perceive accurately the event from the initial stage to be able to recall accurately the event (Loftus, 1979a).

It is not unusual to find either significant errors or for two witnesses to recall the same event differently. Why do two people, experiencing the same event, perceive and recall the event with dramatically different perspectives? There are at least two possible explanations. First, event factors, such as the amount of time exposed to the event or the importance of the details to the witness, may affect accurate memory. A second explanation for differences in memory ability may be factors inherent in the witness. For example, stress, and various expectations can influence the individual's perception of the event.

Lindberg's (1991) taxonomy of the possible variables affecting suggestibility is useful in understanding memory processes (see Figure 1). The purpose for reference to this

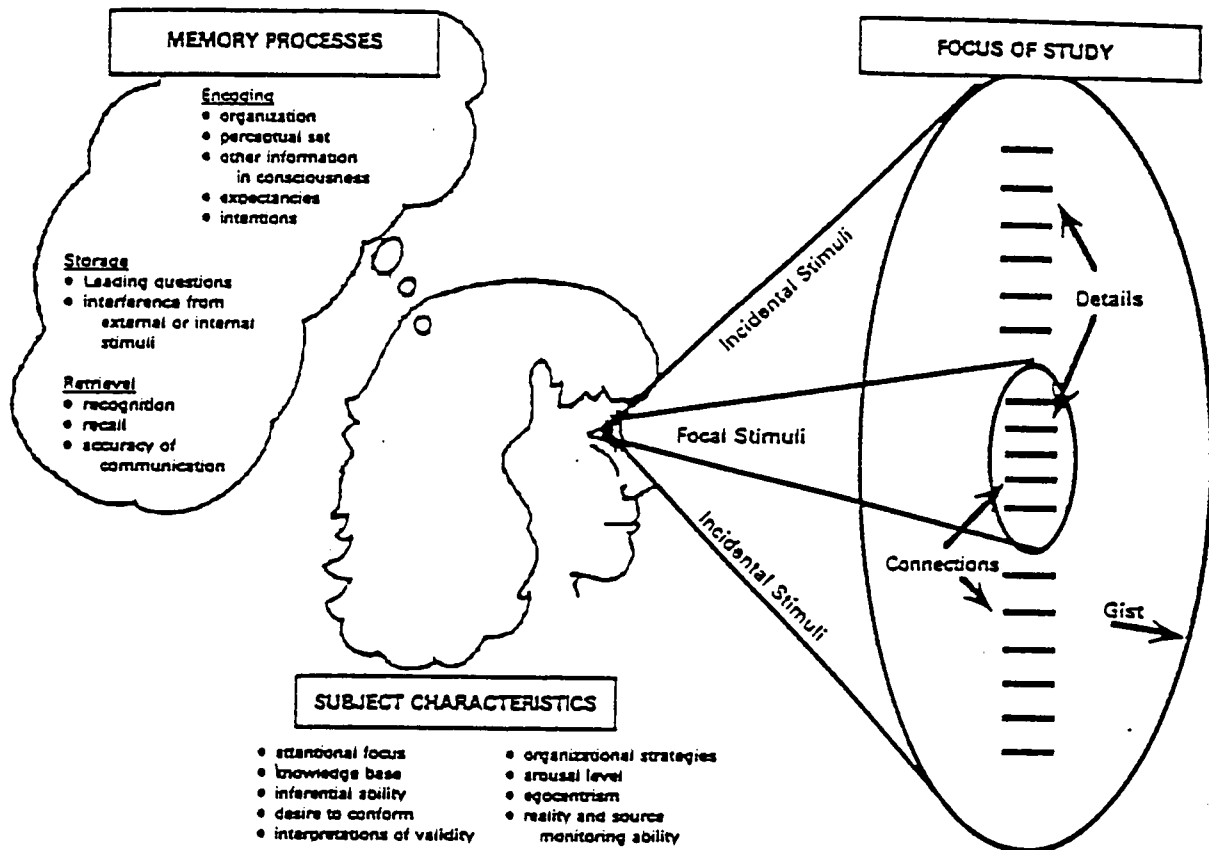


Figure 1. Lindberg (1991) Taxonomy of Variables Affecting Suggestibility. Three major interacting classes of variables are depicted in this information-processing model of memory. SOURCE:

Lindberg, M. (1991). An interactive approach to assessing the suggestibility and testimony of eyewitnesses. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness testimony (pp. 47-55). Washington, DC: American Psychological Association.

taxonomy is to provide a descriptive structure that can lead to greater clarity in the suggestibility literature. However, it is not intended to function as a predictive model; it did provide a means for evaluating outcomes of this study.

The memory process, based on an information processing model, can be described as having three operations: encoding, storage, and retrieval (Thomas, 1992; Loftus, 1979; Lindberg, 1991). As each activity occurs, various aspects of the process must be considered. Encoding manipulations refer to the instructions or expectations that subjects have been given before they see the to-be-remembered event. Storage manipulations refer to the information provided after participants have seen the event. For example, leading questions and interference from external or internal stimuli can affect how the information is stored. Retrieval is the recall of information from storage to some level of consciousness where the information can be used (Loftus, 1979; Lindberg, 1991; Thomas, 1992). Subject characteristics focus on the memory and personality variables displayed at different ages. According to Lindberg (1991), these subject characteristics may include attentional focus, knowledge base, level of arousal, source monitoring, and desire to conform. Although the subject characteristics identified by Lindberg (1991) were not selected for this study, the conception of individual

characteristics affecting the memory process are outlined in his taxonomy.

Drawing from Lindberg's description of the memory process, social conformity may result at the encoding stage. Before the event occurs, the subject has expectancies and perceptions formed from previous experiences that may affect how the event is encoded. Even after the event has been encoded, the subject may be susceptible to leading questions or misinformation. This misinformation is what creates a distortion of the recollection (i.e., trace alteration). On the other hand, the subject may make a conscious decision to confabulate the facts of the event (i.e., social-induced confabulation) in order to protect the self or others. For the purposes of this research, the broader definition of suggestibility has been adopted, including both trace alteration and socially induced confabulation.

Suggestibility

The theoretical perspective of suggestibility often is debated. Suggestibility may be conceptualized as a trait or a state. However, whether or not suggestibility represents a trait or a state is rarely addressed in the literature (Davies, 1991). Yet, this issue must lie at the heart of any debate over the nature of suggestibility. Early research supported a trait hypothesis. Prideaux (1919) proposed a concept of "individual suggestibility" as a

general trait that individuals were supposed to possess to different degrees. Additional evidence of suggestibility as a trait was offered by Aveling and Hargreaves (1921), who administered suggestibility tests to twelve-year-old children. Results indicated that some subjects accepted suggestions on nearly all of the tests, while others were impervious to suggestions. These results indicated that a general factor of suggestibility was strong in some subjects, and other subjects were not influenced by suggestions. However, Aveling and Hargreaves (1921) conceded that the concept of general suggestibility may be modified by situation-specific variables.

On the other hand, many researchers contend that the situation or context appears to have a greater impact on suggestibility than any components of personality disposition (Estabrooks, 1929; Remmers, Cutler, & Jones, 1940). Krech and Crutchfield (1948) concluded that suggestibility was a personality trait of the situation, rather than a trait of the person. An individual could be nonsuggestive in one context, yet highly suggestive when in another context. If suggestibility is a trait, Krech and Crutchfield (1948) argued that an individual's susceptibility to accept suggestive information may be determined by their entire psychological field. In other words, the context in which the suggestive information is offered may have a greater impact than an individual trait

of suggestibility. To demonstrate that suggestibility is a trait, the individual must consistently accept suggestions in a variety of situations (Krech & Crutchfield, 1948). The early empirical research on suggestibility viewed the construct as a part of a personality continuum. An individual could range from "not suggestive" to "highly suggestive." This categorization was described as stable across time and not situation-specific. Although there is little empirical evidence to support the conceptualization of suggestibility as a trait (Baxter, 1990), the trait hypothesis was investigated as the theoretical perspective of this study.

For purposes of this study, suggestibility has been defined as the degree to which "encoding, storage, retrieval, and reporting of events can be influenced by a range of social and psychological factors" (Ceci & Bruck, 1993). This broad definition is in contrast to the narrower and more traditional definition of suggestibility that contends that it is "the extent to which individuals come to accept and subsequently incorporate post-event information into their memory recollections" (Gudjonsson, 1986). This narrower definition implies that suggestibility is unconscious (i.e., misleading information is unwittingly assimilated into memory). This definition also assumes that suggestibility is memory-based and the result of misleading information following an event rather than preceding it.

The broader definition of suggestibility implies that (a) it is possible to accept information and be aware of the divergence from the original event; (b) suggestibility can be the result of misleading information preceding or following an event; (c) suggestibility can be the result of social as well as cognitive factors (Ceci & Bruck, 1993). This broader conceptualization of suggestibility is consistent with the legal use of this term to exemplify the ease with which one can be influenced by the use of subtle suggestion, leading questions, as well as threats, bribes and additional forms of inducement (Ceci & Bruck, 1993).

The question of whether or not personality variables are related to suggestibility arises as one attempts to answer the following questions: To what extent can memories be altered by suggestion? Can individuals be led to remember things that are contrary to what they have actually seen? This study offered, two alternatives to describe the relation between memory impairment and suggestibility. First, a poor memory may be explained by the memory impairment hypothesis (Loftus, Miller, & Burns, 1978). According to this hypothesis, for individuals exposed to misleading questions (i.e., misinformation) about a witnessed event, suggestions will impair their ability to remember factually what was seen. The memory impairment hypothesis asserts that as a consequence of this impaired memory, individuals will remember events according to the

misleading suggestions instead of the events actually witnessed. This hypothesis encompasses those situations in which misinformation alters or impairs the ability to retrieve previously stored information (Zaragoza, 1991). Secondly, individuals may also be vulnerable to the tendency to conform or comply with suggestions from another person or source. These individuals accurately remember the event but conform to the misleading suggestion. Gudjonsson (1986), in a study of 30 male subjects, found a positive correlation between acquiescence and suggestibility.

The memory impairment hypothesis and the tendency to be susceptible to suggestion can be described as two types of distortion. The first type, trace alteration, occurs when there is some alteration or erasure of the original trace for an event. For example, if a postevent suggestion is given and this leads to an alteration of the trace, then that trace should be difficult, perhaps even impossible, to recover in all retrieval environments. This type of distortion is by definition unconscious. There is no intention of withholding information or providing misleading information. The individual has an inability to recall correctly the event in question. The second type of memory distortion is a socially induced confabulation. A false report is made and the individual is aware of the falsity. In other words, this type of distortion is conscious. For example, people may be threatened, bribed, or persuaded to

falsify their accounts. Both are forms of suggestion but are differently subscribed by the individuals.

Personality

Critical to this study is the analysis of personality characteristics as they may or may not relate to a predisposition to be susceptible to suggestion. Traditionally, personality has been conceptualized from a variety of theoretical perspectives, such as Freud's (1960) focus on motivation behind human behavior and Jung's (1931) emphasis on the cognitive characteristics of personality. For the purpose of this study, a definition of personality was selected that incorporated the "whole" person. An individual's personality includes the motivation behind the behavior, the style of cognitive processing, and the interpersonal skills used when relating with others.

To explain various styles of human functioning, differing by the motivation preceding the behavior, three terms "existence," "adaptation," and "replication" are important. Freud's (1915) theoretical perspective, conceptualizing the mind as a framework of three interlocking polarities, may be used to consider the mind. To describe motivation, there are three polarities: subject (i.e., the ego or inner-self) - object (i.e., the external world), pleasure - pain, and active - passive. (Freud, 1915).

According to Freud's framework, the psychological polarity of "existence" coincides with the polarity of pleasure pain. The distinction is between the tendency toward seeking to achieve positive reinforcement (i.e., pleasure) or attempting to avoid pain.

The second term, "application," may be explained as a bipolarity between the ecological accommodation and ecological modification. Ecological accommodation is characterized by an inclination to "fit in" passively by locating a niche and remaining securely anchored. By contrast, ecological modification is characterized by rearranging or changing the elements of the environment that are unsuitable. Either a passive or an active role permits adaptation (Millon, 1994).

The final term, "replication," pertains to Freud's (1915) conception of the polarity of subject and object. A focus on the "subject" refers to an inward concentration or maximizing individuation. At the other end of the polarity is a focus on the "object" or a tendency to be nurturing to others.

Individual cognitive differences and the expression of these variations has been overlooked in the assessment of personality traits. Historically, the areas of ability, aptitude, and intellect have not been considered in the study of personality (Wilson, 1978; Millon, 1994). Jung (1931) developed a bipolar schema to assess personality

types that were comprised of cognitive concepts. Although Jung did not make a reference to cognitive processes, three of his bipolarities--Extraversion and Introversion, Sensing and Intuitive, and Thinking and Feeling--are firmly anchored in the cognitive domain (Keirsey & Bates, 1984).

To operationalize a definition of personality, the theoretical perspective adopted for this study was considered. To explain various styles of human functioning that differ by the motivation preceding the behavior, Freud's (1915) theoretical perspective, conceptualizing the mind as a framework of three interlocking polarities, may be used. Jung (1931) developed a bipolar schema to assess personality types that were comprised of cognitive concepts. Interpersonal behavior is important for the purposes of noting how people relate in everyday experience. An individual's style of relating may predict the future outcome of a person's family, work, and a variety of social experiences. To derive a picture of the whole person, Freud's conception of motivation, Jung's conception of cognitive styles, and various interpersonal characteristics were considered.

Suggestibility and Personality

Few studies have examined the individual differences related to the accuracy of eyewitness memory and the possible influence on memory of the individual's

suggestibility. Why were some individuals misled by the experimenter's presentation of false information while others were not? To address this question, we must first recognize that the recollection of the same event for two individuals may differ. These individuals differ both in their ability to recall information from the event and to accept distortions as the result of misleading information. Although individual differences in memory and suggestibility are accepted, little is known about these differences. As noted in the Lindberg (1991) taxonomy, various subject characteristics or personality variables have been recognized as having a possible influence on suggestibility of memory. Intuitively, various researchers have proposed that a yielding, conforming, and hesitating personality can be expected to increase the likelihood of accepting suggestive or leading information (Flin, 1991; Zaragoza, 1991). However, little empirical evidence of this relationship exists. Few studies have systematically examined personality variables to determine how individual differences may mediate differences in eyewitness memory and susceptibility to suggestibility.

Are there personality variables that predispose an individual toward accepting suggestive and erroneous information? The limited amount of research in this area has yielded mixed results. Ward and Loftus (1985), in a study of 112 undergraduate students, found differences in

terms of suggestibility to postevent information. This study examined the relationship between performance on a memory task and various Jungian psychological types as assessed by the Myers-Briggs Type Indicator (Myers, 1962). Suggestibility of memory was assessed by showing slides of an accident to two groups of subjects. The experimental group received false information; whereas, the control group did not. A single question was used to determine suggestibility. Subjects were compared by condition and whether or not the suggestion was accepted. Results of this study indicated that introverts and intuitives, both alone and in combination, were found to be more prone to accept misleading postevent information (Ward & Loftus, 1985).

A study by Trouve' and Libkuman (1991; cited in Schooler & Loftus, 1993) found contradictory results. In their study, extroverts were found to be more susceptible to accepting false information than were introverts. In regard to the Jungian personality variable of intuition, Trouve' and Libkuman (1991; cited in Schooler & Loftus, 1993) found intuitive individuals to be more suggestible. Their finding was in agreement with the Ward and Loftus (1985) results. Thus, based on the limited research investigating the relationship of personality factors and susceptibility of suggestion, intuitive individuals who rely less on sensory information than their sensing counterparts may be more susceptible to misleading information.

Another personality variable that has been predicted to be related to suggestibility is that of social conformity. Whether or not subjects incorporate postevent suggestions may be dependent on the desire to behave in a manner that is expected by the experimenter. If the experimenter is viewed as an authority figure, subjects may more readily accept the false information. Gudjonsson (1986), in a study of 30 males, found interrogative suggestibility to be positively correlated with acquiescence (i.e., the tendency to agree with questionnaire statements regardless of the content). Zaragoza (1991) speculated about the possibility that misled subjects may be conforming to the misleading suggestion even though their memory has not been impaired. These studies support a hypothesis of social conformity or social desirability having a relationship to an individual's susceptibility to suggestion.

Tousignant (1984; cited in Schooler & Loftus, 1993), in an unpublished study, investigated the different ways in which individuals may respond to the social demands associated with completing a personality questionnaire. It was hypothesized that those individuals who were more apt to respond in a socially desirable manner on a personality questionnaire and have a higher level of self-consciousness would be more inclined to accept the false suggestions offered by the experimenter. Results for the group receiving the misinformation indicated no significant

correlation between either the social desirability or self-consciousness and suggestibility. Although these characteristics were unrelated, several factors were found to be predictive of an individual's susceptibility to misinformation. For example, greater visual imagery abilities, a cognitive process, was related to the inclination to accept misinformation. A second predictor of suggestibility was acquiescence. An individual who was willing to agree with an untrue self description item was more apt to accept suggestions. Third, measures of suggestive memory were predictive of susceptibility to misinformation. Individuals who indicated having a good memory were more suggestive than individuals who reported having a poor memory. Although this relationship was unexpected, it was statistically significant for three of four subjective memory measures (Tousignant, 1884; cited in Schooler & Loftus, 1993).

CHAPTER III

METHODOLOGY

The present study was designed to determine what personality characteristics, if any, may be related to suggestibility of memory. Two conditions were selected to investigate this relatedness. The conditions were presented with similar memory tasks, demographics, and personality characteristics. Subjects' responses in each of the conditions permitted analysis of their susceptibility to suggestive information.

Research Design

An experimental research design was used for this study. Subjects were assigned to two groups whose members received different pieces of information. Both groups were administered a pretest to assess the subjects' levels of memory for viewing a short film. Only one group was subjected to the stimulus of suggestive (i.e., erroneous) information. A posttest was administered to both groups to determine if the suggestive stimulus altered the ability of the group receiving suggestion to remember information from the short film as accurately as the group who did not receive a leading introduction or suggestive questions

contained in the pretest. For convenience the two groups will be referred to as "experimental" for those who received erroneous suggestive information and the other group will be referred to as "control" to describe those who did not receive the suggestive materials. Although an experimental design was used, the traditional use of experimental and control groups for the comparison of data was not performed. The purpose of the two groups was to explicate the differences in encoding. However, in this study, it should not be inferred that the "control" group receives no suggestive information because the consistency of questions could have been interpreted as suggestion was carried out for both of the groups.

Assignment to an experimental group or a control group was made during the recruitment session. Students were then asked to sign up for participation in the research project at various dates and times. This selection of a time was used to assign subjects to the experimental group and control group.

Subjects

A sample of 101 college students (85 females and 16 males) with a mean age of 21.17 ($SD = 4.43$) were recruited at the University of Tennessee, Knoxville, from several College of Human Ecology courses in which credit was given for participation in this research study. Subjects were

predominantly white and ranged from freshman to seniors. The grade-point average of the sample ranged from 2.00 to 4.00, with a mean of 3.08 and a standard deviation of 0.53.

The experimental group was comprised of 44 participants (36 females and 8 males) with a mean age of 22.29 (SD = 6.38). Two of the participants in the experimental group were nontraditional students aged 48 and 52. The mean grade-point average of the group was 3.14 (SD = .56).

The control group consisted of 57 participants (49 females and 8 males). The mean age was 20.30 (SD = 1.45). For the control group, the mean grade-point average was 3.03 (SD = .50).

The size of the experimental and control groups was unequal due both to the assignment of subjects to groups and to attrition. The subjects selected a time for participation from a prearranged list of dates and times. Various times were listed to accommodate the schedules and responsibilities of college students. Thus, the groups became unequal. Attrition from the first to second session also accounted for a decrease in the group size. In the experimental group, five subjects did not return to the second session. This comprised 10% of the total subjects attending the first session. In the control group, eight subjects withdrew. This comprised 12% of the total sample from the first session. Attrition rates were not different for the two groups. Although these two percentages are

similar, this does not necessarily prove that the two groups are equivalent, but it does move toward the assumption that the groups are similar in attrition.

Instrumentation

The instruments selected for this study were designed to measure suggestibility of memory and various personality variables. The Lindberg Suggestibility Assessment provided a measurement of memory level and degree of suggestibility (Lindberg, 1991). The Millon Index of Personality Styles (MIPS) was selected, as it provided a profile of an individual's motivating aims, cognitive modes, and interpersonal behaviors (Millon, 1994). Individual characteristics, assessed by contrasting adjectives on a continuum, were utilized in the MIPS to determine what personality styles may be predictive of highly suggestive responses. Ambiguity tolerance, assessed with the AT-20 (MacDonald, 1970), was measured to determine if people with low tolerance of ambiguity might be more suggestible. If an individual is able to cope with a high degree of ambiguity, it is reasoned that this individual would be less suggestible. These individuals may be able to ignore misleading information.

Lindberg Suggestibility Assessment

The Lindberg Suggestibility Assessment provided a measure of levels of memory capability for each group of subjects and measured levels of suggestibility (Lindberg, 1991; Kiefer, 1991). The assessment includes a 3.5 minute video portraying a mother and her two sons. During the video, the boys and mother interact, and the mother apparently hits the younger boy. Before the subjects viewed the Lindberg video, encoding manipulations were given to both groups by using different introductions to the film written by Lindberg. The encoding manipulations included an experimental condition in which subjects were told that the child, Marc, was a bad boy; in the control condition, subjects did not receive an evaluation of either the mother or the boy. Only the experimental group read this introduction describing Marc as a bad boy:

We are studying your memory for television shows. This is a show about two boys and what happens when they come home from school. The younger boy, Marc, has been a problem in school, and has caused a lot of problems. He has even fallen to the floor and kicked his mother and teacher. He does not obey his mother or his teachers. Typically, he gets away with lots of misbehavior. Marc is very disrespectful of his mother, who has tried to help him but does not know what to do with him. Her kind and gentle ways of trying to make

him behave have not worked very well. Marc just ignores his mother and even tries to make her life harder for her. Your task is to remember everything that all of the characters say and do in the video.

In order to control for any effects associated with reading an introduction to the film, the control group read a neutral introduction.

We are studying your memory for television shows. This is a show about two boys and what happens when they come home from school. Your task is to remember everything that all of the characters say and do in the video.

Levels of Memory Assessment -- First Administration.

Items on both questionnaires equivalently assessed levels of memory for all subjects. Following the showing of the video, subjects completed the first memory questionnaire. This questionnaire contained leading questions about the events and characters in the video. Five items assessed memory for central details. The following are the five memory for central details questions from the initial questionnaire:

1. In one sentence, describe the Nintendo game that Marc was playing.
2. What did the mother's note say?

3. What was Marc saying when the mother went over to him and had him stand up?
4. Why were the boys late getting home from school?
5. What did the older boy go to do while the younger boy was playing video games?

These items are considered central details because the subjects were instructed to pay close attention to the actions and verbal interactions between all of the characters.

Suggestibility Assessment -- First Administration.

Only subjects in the experimental condition were given the suggestive encoding introduction before viewing the video and two questions that included suggestive misleading information. The following are the leading questions from the initial questionnaire given to the subjects in the experimental group:

1. What was in the four bags of groceries that the mother was carrying?
2. What was the mother saying as she was taking Marc to the kitchen to wipe the blood coming from his bloody nose?

These questions and additional items provided the subjects with misleading information that was contrary to the events portrayed in the video. It was assumed that those subjects within the experimental condition who were susceptible to

suggestion would encode the suggestive information into memory as if they were facts that had occurred in the video. Subjects within the control condition were given similar questionnaires with the following questions:

1. What was in the bags of groceries that the mother was carrying?
2. What was the mother saying as she was taking Marc to the kitchen?

Items on both questionnaires equivalently assessed all subjects' level of memory.

Levels of Memory Assessment -- Second Administration.

A time interval was necessary for the original memory trace to be altered by distortion or the acceptance of suggestive information (Flin, 1991; Brainerd & Ornstein, 1991). After one week, all of the subjects answered a second memory questionnaire to assess the degree of susceptibility to suggestion within the longer period of time. This questionnaire followed the initial presentation of the misinformation to determine if subjects incorporated the false information into the memory of the actual event. At this time, the same questionnaire was administered to the experimental group and to the control group. The items on the second questionnaire were similar to those on the first questionnaire requiring recall of events from the video. One purpose of this questionnaire was to assess the amount

of suggestive information that was over time accepted as factual by the experimental group. If an experimental subject accepted the suggestion, the response on the questionnaire would be inaccurate. Another purpose of the second administration of the questionnaire was to determine each subject's level of memory in both the experimental and the control groups (Lindberg, 1991).

Millon Index of Personality Styles

Critical to this study is the analysis of personality characteristics as they may or may not relate to a predisposition to be susceptible to suggestion. Traditionally, the personality measurements have not included behaviors associated with interpersonal relationships (Jung, 1931; Keirsey & Bates, 1984). For the purpose of identifying various personality characteristics to determine whether or not they relate to suggestibility of memory, the Millon Index of Personality Styles (MIPS) served as the assessment instrument that would assess characteristics of the whole person as a unified totality (Millon, 1994). Other personality tests have focused on behavior to the exclusion of motivational traits and cognitive characteristics. While the Myers-Briggs Personality Test correlates with the attributions of the MIPS (Millon, 1994) and the Keirsey Temperament Sorter many of the features of the MIPS, only the MIPS attends to these

three dimensions of personality.

The MIPS is divided into three scales: motivating aims, cognitive modes, and interpersonal behaviors. The following literature provides a descriptive explanation of the three scales. For each scale, the various bipolarities are defined to describe characteristics of the individual scoring high at each extreme of the continuum. Although bipolar descriptors are used, no individual is at one extreme to the exclusion of the other (Millon, 1994).

Each of these scales can be useful in the study of the various personality variables that are related to suggestibility of memory. Table 1 depicts a brief description of each of the personality characteristics assessed by the MIPS. The order of the personality characteristics is important. The terms are pairs of bipolar traits. For example, the term "enhancing" is the bipolar opposite of "preserving." The first scale, motivating aims, examined the individual's orientation toward obtaining reinforcement from the environment. Determining the extent of motivation, the source of reinforcement, and the approach toward interacting in the environment can be useful in understanding an individual's motivation for accepting false information. The second scale, cognitive modes, assessed the individual's style of information processing. Because an information processing model of cognition served as the theoretical foundation. An

Brief Description of Millon Index of Personality Styles

<u>Motivating Aims</u>	
Enhancing	Optimistic, easily enjoy themselves
Preserving	Pessimistic, easily upset by minor problems
Modifying	Take control of their life and circumstances
Accommodating	React to life's circumstances, little initiative
Individuating	Primary concern for personal needs and wishes, independent, egocentric
Nurturing	Attend to the needs of others, nurturing
<u>Cognitive Modes</u>	
Extraversing	Stimulation found in others
Introversing	Inspired by personal thoughts and feelings
Sensing	Prefer facts and concrete information
Intuiting	Prefer symbolic and unknown information
Thinking	Logical; analytical; objective, impersonal decision making
Feeling	Subjective, affective decision making
Systematizing	Organized; conscientious; perfectionist
Innovating	Prefer the unanticipated; creative
<u>Interpersonal Behaviors</u>	
Retiring	Passive; uninvolved; social indifference
Outgoing	Socialites; dramatic reaction to situations
Hesitating	Sensitive; shy; nervous in social settings
Asserting	Egocentric; self-assured; ambitious
Dissenting	Spirited; reject traditional standards
Conforming	Self-controlled; cooperative
Yielding	Submissive; may act in self-demeaning manner
Controlling	Aggressive; forceful; competitive
Complaining	General dissatisfaction; feel misunderstood
Agreeing	Well liked by others; amenable; loyal

SOURCE:

Millon, T. (1994). Millon index of personality styles. San Antonio: The Psychological Corporation.

understanding of individual's information gathering strategy and style of processing this information is important to memory development, as well as suggestibility of memory. The third scale assessed the individual's interpersonal behavior. The extent to which a person interacts with others can influence one's susceptibility to the adoption of suggestive information.

The Millon Index of Personality Styles (MIPS) provides a comprehensive report of general personality characteristics of normal adults (Millon, 1994). The questionnaire consists of 180 true/false items. For the MIPS' three scales--motivating aims, cognitive modes, and interpersonal behaviors--norms were developed by Millon (1994) for both an adult standardized sample (N=1000; males=500, females=500) and a college standardized sample (N=1600; males=800, females=800). The median coefficient alpha for Millon's (1994) college sample was .77. The median split-half reliability across the 24 MIPS scales was .80.

Prevalence scores were used to reflect accurately the percentage of each MIPS trait occurring in the real world. After obtaining a score, an individual was positioned on a continuum in relation to others possessing the same trait. MIPS prevalence scores ranged from PS 0 to PS 100. Millon explained:

The system was designed in such a way that the

proportion of individuals who score at or above PS 50 on each scale matches the prevalence of individuals in the general population who possess that trait (Millon, 1994, p.50).

If an individual receives a score at or above PS 50, that person is classified as a member of the trait group defined by the particular scale. For example, scores at or above PS 50 for the introverting scale are classified as introverts. Scores below PS 50 are classified as not belonging to that particular trait group. Higher scores on a scale reflect a greater intensity of the trait group measured by the scale. For example, an individual scoring PS 79 on the introverting scale is classified as more introverted than a person scoring PS 50.

Ambiguity Tolerance

Ambiguity Tolerance was measured by the AT-20 (MacDonald, 1970), a 20-item revision of a test developed by Rydell-Rosen (Rydell, 1966). Rather than use the true-false format of MacDonald's (1970) original AT-20 scale, subjects in this study were asked to indicate agreement or disagreement on a six-point Likert-type scale. The scale does not offer the opportunity to select a neutral response. The AT-20 is a measure of the way in which an individual structures information about ambiguous situations, when confronted with unfamiliar, complex, or incongruent cues

(Prosen, 1980). There are twenty self-report items on the measure. Reliability on the AT-20 was reported at .86 (split-half, corrected Spearman-Brown); retest reliability was reported at .63 for a six-month interval (Rydell, 1966). The scale was reported as not related to social desirability as measured by the Marlowe-Crowne. Findings on the validity of the AT-20 showed that it was related to performance on a complex task, dogmatism, and rigidity (MacDonald, 1970).

Procedure

Each student was asked to participate in two research sessions spaced one week apart. The sessions were conducted in a media room at the university's library. Students were told that the research would assess their ability to remember information and their individual personality characteristics. The duration of the first session was approximately 45 minutes. The second session lasted about 20-30 minutes.

Session One

To begin the session, students were asked to sign an informed consent form and to complete a short survey of demographic and descriptive information. Then, the project director gave the students a written description about the video they were about to watch. This introduction provided a set for the Lindberg video. The students were then asked

to watch the video. Immediately following the video, the students completed a questionnaire to assess their memory of the events that occurred in the video. At the end of the session, they completed a 180-item true/false questionnaire (Millon, 1994) to determine their individual personality style.

Session Two

One week later, in the second session, students completed a second questionnaire to determine the effect of time on the memory process. Again, the questionnaire surveyed their memory of the events viewed in the Lindberg video. To end the session, a 20-item ambiguity tolerance test was administered.

Rationale for the Present Study

The limited amount of research that has investigated the relationship between individual personality differences and suggestibility of memory lends support to the need for this research study. Various personality assessments were available, such as the MBTI. However, because this investigation was exploratory in nature a broader conception of personality was necessary. The purpose of this study was to assess the suggestive nature of numerous personality traits for which the MIPS seemed to be more appropriate. Millon's (1994) personality test enabled the identification

of an individual's motivation for interacting in the environment, described characteristics of interpersonal behaviors, and provided cognitive styles of information processing. The motivation underlying an individual's behavior, how an individual relates to others, and the style an individual uses for processing information may affect susceptibility to accept misinformation.

The Millon (1994) cognitive styles, based on a Jungian conceptualization, are similar to the Myers-Briggs Type Indicator (Myers, 1962). In a study conducted to compare the MBTI and the MIPS, both instruments were administered to 100 adults. The correlations ranged from a low of $r = .55$, $p < .01$ for MBTI Perceiving and MIPS Innovating, to a high of $r = .75$, $p < .01$ for MBTI Sensing with MIPS Sensing. "The magnitude of these correlations clearly supports the hypothesis that the MIPS Cognitive Modes scales measure essentially the same constructs of the MBTI (Millon, 1994, p. 72). Thus, the results of the present research may be compared to previous eyewitness memory studies using the MBTI to assess personality (e.g., Ward & Loftus, 1985; Trouve' & Libkuman, 1991).

The individual personality differences associated with suggestibility of eyewitness memory remain a complex unknown process. The personality traits that are conducive to the acceptance of inaccurate suggestions have little empirical evidence to substantiate such claims. In fact, the existing

research offers conflicting results. Available literature fails to conceptualize the factors associated with the general personality variables that may mediate a susceptibility to accept false information. This study postulated that it may be possible to determine a theoretical descriptive taxonomy of subject characteristics that may be predictive of suggestibility of memory. A description of the personality variables, if any, that precipitate a suggestive memory for an event may be the first step in the generation of a more concise predictive model.

CHAPTER IV

RESULTS

The results section first reports the demographic and descriptive information of the subjects. The next set of analyses present the results of the memory questionnaire. Both the memory for central details and the memory manipulations containing the suggestive information are reported. The final section will outline the results of the suggestibility questions. Only the questions yielding significant differences between the two groups will be analyzed to determine whether or not individual personality differences may be predictive of suggestibility.

Descriptive Information

Differences between experimental and control groups' demographic and descriptive data were assessed by t-tests. For the descriptive data (i.e., age, gender, grade point average) there was a significant difference for age only (t -value=-2.29, $p<.05$). However, in the experimental condition two of the subjects' ages were 6-7 standard deviations above the group mean. These subjects were kept in the analyses because age was not a significant factor in any of these analyses. There was no significant difference between the

experimental and control groups for the various personality variables or ambiguity tolerance assessments. Table 2 reports the individual t-tests for both the experimental and control groups.

The Memory Questionnaire (Lindberg, 1991)

Results from Lindberg's suggestibility assessment focused on memory for central details, memory for central details containing a suggestive manipulation, and personality variables that were predictive of susceptibility to suggestibility.

The memory questionnaire for the first session of testing was identical for both the experimental and control groups except for the suggestive and misleading information that was inferred from the introduction given to the experimental group and the two questions asked only of the experimental group. The purpose of the introduction and the leading questions was to present individuals with suggestive information that could be encoded into their memory--thus distorting the original trace alteration. For the discussion of results, the items from this questionnaire will be referred to by "a" and the corresponding number. During the second session, the same questionnaire was used to assess memory for the experimental and control groups. Items from this questionnaire will be referred to as "b" and the corresponding number.

Table 2

T-Values for All variables By Condition (N=101)

<u>Descriptive Variables</u>	t-value	p
Age	-2.29	.024
Gender	.56	.576
Grade Point Average	-1.00	.318
Ambiguity Tolerance	-.79	.433
<u>Personality Variables</u>		
Enhancing	.49	.63
Preserving	-.37	.72
Modifying	-.04	.97
Accommodating	-.52	.61
Individuating	-1.01	.32
Nurturing	-.65	.52
Extraversing	-.83	.41
Introversing	.29	.77
Sensing	-.67	.50
Intuiting	-.31	.76
Thinking	-1.23	.22
Feeling	.12	.91
Systematizing	.27	.79
Innovating	-1.30	.20
Retiring	-.10	.92
Outgoing	-.14	.89
Hesitating	.15	.88
Asserting	-.29	.77
Dissenting	-1.45	.15
Conforming	.39	.69
Yielding	.52	.60
Controlling	-.43	.67
Complaining	-.56	.58
Agreeing	-.27	.79

Note. The t-values are pooled variance estimates.

Memory for Central Details

At the time of encoding, the subjects were directed to focus their attention on the dialogue and actions of the characters in the video. All of the characters' actions, such as eating and drinking a snack, reading the mother's note, and playing a video game were defined as the central details. The memory for central details of the video was assessed by questions requiring recall. Each of the questionnaire items measuring memory of central details is discussed individually.

Question 5a. Question 5a asked the subjects to recall the Nintendo game that Marc was playing. "In one sentence, describe the Nintendo game that Marc was playing." To receive a correct score for this item, the type of game had to be identified or described as race car driving. Although approaching significance, there was not a statistically significant difference ($X^2=3.21$, $p>.07$) between the experimental and control groups in the subjects' ability to recall this information. The proportion of subjects answering this question correctly was 25% for the experimentals and 42% for the controls. Answering this question correctly requires prior experience playing video games of this type. Perhaps the subjects selected for this study were not acquainted with Nintendo games.

Question 7a. An analysis of question 7a, "What did the mother's note say?" found no significant difference ($p>.66$) between the groups' responses. To answer this question correctly, the subjects were required to recall two main points from the note. The experimentals correctly responded to this item 81% of the time, and the controls responded correctly 79% of the time.

Question 10a. There was no significant difference ($p<.14$) for question 10a, "What was Marc saying when the mother went over to him and had him stand up?" The proportion of the experimentals answering this item correctly was 43% and the proportion of the controls responding correctly was 58%.

Question 12a. For question 12a, "Why were the boys late getting home from school?" there was no significant difference ($p>.17$) in memory ability. The correct response rate for the experimentals was 23% and 35% for the controls.

Question 14a. For the recall of question 14a, "What did the older boy go to do while the younger boy was playing video games?" there was no significant difference ($p>.67$). Both the experimental and control groups answered the item correctly 93% of the time.

Memory Manipulations with Suggestive Information

Two of the items on the memory questionnaire were constructed to mislead subjects or to provide them with false information. The experimental group received the false information, whereas, the control group responded to the same general question without the suggestion.

Question 11a. For the control group, question 11a was: "What was the mother saying as she was taking Marc to the kitchen?" The experimental group was asked, "What was the mother saying as she was taking Marc to the kitchen to wipe the blood coming from his bloody nose?" For this question, Chi-square analyses revealed a significant difference ($X^2(1, N=101) = 13.96, p<.001$) between the two groups. The proportion of the controls responding correctly to this item was 32%, whereas, the proportion of the experimentals responding correctly was 2%.

Question 16a. The controls responded to the question, "What was in the bags of X that the mother was carrying?" The experimentals responded to the question, "What was in the four bags of groceries that the mother was carrying?" In the video, the grocery items in the bags were not identifiable. No analyses were conducted on this question.

Encoding of Suggestive Information. The introductory manipulation was the source of the additional three questions invoking a possible suggestive response. These items, presented during the second administration of the memory questionnaire, were based on inferences and evaluative judgments based on the information seen in the video. Only the experimental subjects were given the suggestive manipulation at the time of encoding the information.

Suggestibility Results

During the second session, subjects in the experimental and control groups were asked to respond to the same questionnaire. Several of the items evaluated the subject susceptibility to suggestion. Whether or not the subjects adopted the erroneous information, contrary to the actions occurring in the video, determined the subjects' responses to suggestible information. Following is a discussion of the five items that assessed suggestibility of memory.

Question 2b. Subjects were asked to respond to the question, "How hard did Marc deserve to get hit?" Possible answers ranged from "not hit at all" to "hit really hard." There was no significant difference yielded from Chi-square analyses between how the experimental and control subjects responded to this item.

Question 3b. Subjects were asked to respond to the question, "How many drops of blood fell from Marc's nose?" Possible answers ranged from 0 or no blood present, to 6 or more drops of blood. Actually, in the video, there was no blood present. Only the mention of blood was presented to the experimentals. Chi-square analyses revealed a significant difference, $X^2(1, N=101) = 27.45, p < .000001$, between the groups' responses. The proportion of control subjects answering this question correctly was 57%; whereas, only 9% of the experimental subjects responded correctly. On average, the control subjects reported much less than 1 drop of blood ($M = .24$). On the other hand, the experimental subjects reported seeing more blood, $M = 1.96$. Five individuals in the experimental condition reported seeing six or more drops of blood. This question yielded significant difference between the experimental and control groups in the degree of suggestibility.

Question 7b. This question asked subjects, "How many bags of groceries was the mother carrying?" In the video, the mother was carrying two bags of groceries. However, the experimental condition received a suggestion that she was carrying four bags. The possible scores ranged from 0, no groceries, to 6 or more bags of groceries. There was no significant difference between the groups. The controls responded correctly 25% of the time, and the experimentals

responded correctly 38% of the time.

Question 9b. Subjects were asked to rate the child in the following question, "Overall, how good a person was the younger boy Marc?" Possible scores ranged on a 6 point Likert-type scale from "very bad" to "very good." During the encoding phase, the experimental condition read a brief introduction about the mother and her child, Marc. Marc was described as a "bad boy." The control condition did not receive any information about the child. Significant difference between group responses was found. Chi-square analyses revealed significant difference between the experimental and control subjects' ratings of Marc, $X^2(1, N=101) = 4.57, p<.03$. Subjects in the experimental group rated Marc as "very bad" to "somewhat bad" more frequently than the control condition. To illustrate this point, 54% of the experimental subjects but only 33% of the controls rated Marc as bad. This question, including the presence of suggestive information, demonstrated significant difference between the groups' responses.

Question 11b. Rating of the question, "Overall, how good a person was the mother?" ranged on a six-point Likert-type scale from "very bad" to "very good." There was no significant difference in the groups' responses, as they rated the mother in a similar manner. The proportion of

subjects in the control group who rated her favorably was 37%, and 30% of the experimentals rated her as good.

As a result of these initial Chi-square analyses, two questions revealed statistically significant differences between responses from the experimental and control groups. These two items were used to determine whether or not the personality variables of the subjects may be predictive of susceptibility to suggestive information--the primary consideration of this research study.

Suggestibility and Personality Variables:

A Logistic Regression Model

In order to assess the relationship of personality and ambiguity tolerance to suggestibility, a multivariate, non-parametric statistic--logistic regression--was used. Because the dependent variable was dichotomous as in this study (i.e., suggestive or not suggestive), there was a need to select a non-linear logit regression model. Logistic regression, based on a chi-square distribution, calculates the estimated coefficients of the independent variables. If statistically significant, the logistic coefficients can predict the log odds of the occurrence of the dependent variable, in this study being suggestible (Gottman & Roy, 1990). The independent variables, including various personality characteristics derived from the MIPS and

ambiguity tolerance, were introduced into the model and regressed against the dichotomous dependent variable of suggestibility. As opposed to other forms of nonparametric statistics, logistic regression permits the entry of several independent variables into one equation. The intention for this analysis was to identify the best predictors of suggestibility of memory and to evaluate the overall predictability of the model.

To determine whether or not the model fits the data, the goodness-of-fit statistic was calculated for all of the independent variables. The null hypothesis was that the model fits perfectly. If the level of observed significance is large, the hypothesis that the model fits is not rejected. A model of all of the independent variables may be assessed by the goodness-of-fit statistics. There is a comparison between the calculated model and the "perfect" model. If the observed significance level is large, the calculated model does not differ significantly from the "perfect" model (Norusis, 1990).

Question 3b. The purpose for the use of this regression was to identify the independent variables that were the best predictors of suggestibility. The results of the logistic regression analysis are listed in Table 3. The initial model, including all of the independent variables, was regressed against the dichotomous dependent variable of

Table 3

Logistic Regression Analysis of Question 3b
Significant Personality Characteristics Relating to the
Experimental Condition

Variable	B	SE	df	Significance	R	Exp (B)
Condition	-1.54	.38	1	.0000	-.37	.19
Sensing	.05	.02	1	.0024	.24	1.05
Innovating	.04	.02	1	.0192	.17	1.04
Agreeing	.04	.01.	1	.0042	.22	1.04

	Chi-Square	df	Significance
Model Chi-Square	48.02	4	.0000
Improvement	6.34	1	.0118
Goodness of Fit	83.41	96	.8168

N=101

suggestibility for the item asking subjects to identify the number of drops of blood that were seen in the video. The Model Chi-square of 48.023 (5, $N=101$, $p<.00001$) indicated that the model was a good predictor of the probability of suggestibility on this questionnaire item. Figure 2 provides a model of all of the independent variables that made a significant contribution to the model. The groups' responses and the personality variables of sensing, innovating, and agreeing were positively related to suggestibility. For this model, the goodness-of-fit was significant ($X^2=83.41$, $p<.00001$); thus, the model was a good predictor of the probability of suggestibility.

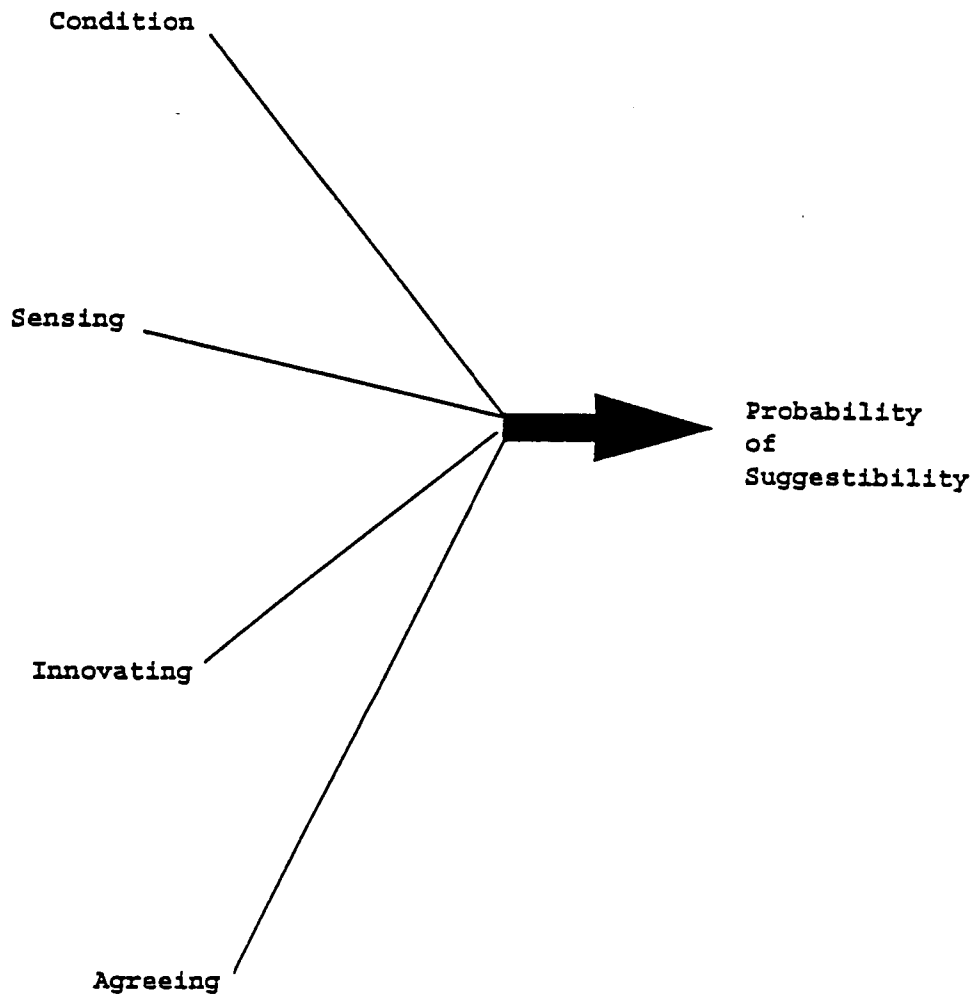


Figure 2. Suggestibility Model for Question 3b.

Question 9b. The results of the logistic regression are listed in Table 4. Each of the independent variables was regressed against the dependent variable of suggestibility for the item asking subjects to provide a rating for Marc, the "bad boy" described for the experimental group. The Model Chi-square of 10.112 (2, $N=101$, $p<.006$) was a fairly good predictor of the probability of suggestibility on this questionnaire item. A model of the variables making a significant contribution to the model are depicted in Figure 3. The groups' responses and ambiguity tolerance were positively related to susceptibility of suggestion. No personality variables from the MIPS appeared to be related to this item. For this model, the goodness-of-fit was significant ($X^2=10.11$, $p<.006$).

Table 4

Logistic Regression Analysis of Question 9b

Variable	B	<u>SE</u>	df	Significance	R	Exp (B)
Condition	.50	.22	1	.02	.16	1.65
Ambiguity Tolerance	.04	.02	1	.03	.15	1.04

	Chi-Square	df	Significance
Model Chi-Square	10.11	2	.0064
Improvement	5.53	1	.0187
Goodness of Fit	102.24	98	.3648

N=101

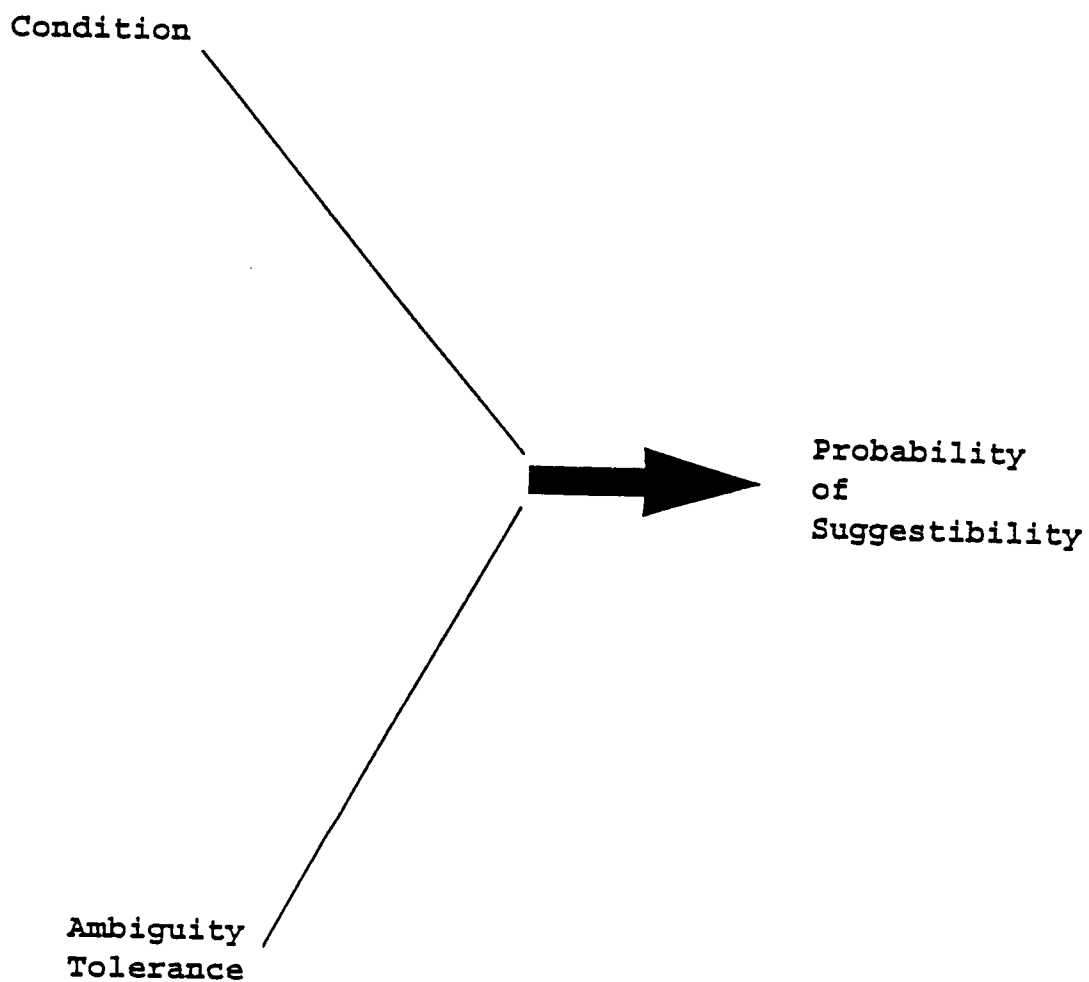


Figure 3. Suggestibility Model for Question 9b.

CHAPTER V

DISCUSSION AND CONCLUSION

The results of this study seemed to indicate that susceptibility to suggestive information may differ for various personality types. To determine whether or not the treatment and control groups were comparable, the groups were compared for age, gender, memory, personality traits and ambiguity tolerance--when suggestive, misleading information had not been provided. As presented in the results section, the groups were comparable. The only variation between the groups was an age difference that may be explained by the two subjects participating in the experimental condition who were several years older than the mean age of their group.

Differences between the experimental and control groups did not emerge in terms of memory for central details. As expected, the Chi-square scores performed on the items assessing memory for central details by the two groups were not significantly different.

One item from the initial test designed to offer the suggestive misinformation revealed significant Chi-square differences. Answers by the two groups to Question 11a, "What was the mother saying as she was taking Marc to the

kitchen?" were statistically different. The experimental group was offered the manipulation of the mother wiping blood from Marc's bloody nose. When the experimental group was offered the misinformation, the subjects did not respond correctly to the question. Only one of the 44 subjects in the experimental group responded accurately to this question. This may be due to the incongruency offered in the introduction containing the false information immediately following the actual event of viewing the video. Other than this item offering a suggestive manipulation, the two groups were similar in their response to the five questions pertaining to memory for central details. This allows the assumption to be made that the experimental and control groups were similar in their eyewitness memory ability for this event, with the exception of the memory for the central-details item containing the misleading suggestions offered to the experimental subjects. This permits a comparison of the groups to focus on their susceptibility to suggestive misinformation.

The models resulting from the logistic regression analyses may be used to create an anecdotal description of the individual personality variables that are predictive of suggestibility of memory. Logistic regression determines the ratio of the probability of being suggestive or nonsuggestive for a one-unit change in the personality variables. The individual personality variables that were

significantly related to suggestibility were sensing, innovating, agreeing, and having a low ability to tolerate a high degree of ambiguity.

In a previous research study, Ward and Loftus (1985) found the intuitive individual to be more susceptible to suggestion. The intuitive characteristic, based on Jung's conceptions, is the polar opposite of the sensing personality trait described by Millon (1994). The results of this study contrasted with the findings from other studies pointing to the intuitive individual being most suggestive (Ward & Loftus, 1985; Trouve' & Libkuman, 1991, cited in Schooler & Loftus, 1993). For the present study, sensing was found to be significant in the logistic regression analysis determining the extent of suggestibility. In other words, for Question 3b, the sensing individuals reported seeing blood more often than the intuitive individuals.

Why would the sensing individual be more susceptible to the acceptance of misleading postevent misinformation? Individuals who are described as sensing are grounded firmly in reality, prefer facts, and believe in experience. On the other hand, intuitive individuals are imaginative, living in anticipation, and may miss details (Keirse, 1984). In this study, the sensing individual may have been more influenced by the concrete nature of the suggestion. The manipulation of seeing blood was presented in a question on the first

questionnaire; perhaps the sensing individual accepted this as concrete, observable information. Rather than accept their memory of the video that was ambiguous in nature, they preferred the factual nature of the questionnaire. In other words, they attended to the direct and observable information rather than making inferences about an event that is open to interpretation. On the other hand, the intuiting individual may have rejected the suggestive information in the first session because it was not necessary for responding to the question. Persons unconcerned with the concrete details, as intuiting persons may be, and more focused on the symbolic may not even encode this information.

Another cognitive mode, innovating, was found to be predictive of suggestibility of memory. Millon's (1994) personality type of innovating is similar to the perceiving personality type from the Myers-Briggs Type Indicator (Myers, 1962). The innovating individual may be described as having an inclination toward being creative and taking risks. They are described as open-minded, flexible, and spontaneous. They are ready to restructure information in novel ways. In this study, the innovating individual may have encoded the initial information depicted in the video but readily adopted this information when presented with the possibility of an alternative interpretation offered by the suggestive posttest manipulation.

One of the interpersonal behaviors, agreeing, was predictive of susceptibility of suggestibility. The agreeing individual was described as cooperative and socially amicable to others. They have a willingness to alter their preferences to be congruent with the perspectives of others. They may concede when necessary. For the present study, the agreeing interpersonal behavior would be expected to be predictive of an individual who accepts misleading information and incorporates it into the memory of an event. The agreeing individual does not want to upset or disagree with others and will accommodate behaviors to match others. In this study, the agreeing person accepted the suggestive false information. In other words, the agreeing person may have encoded the actual event, the video, but altered this to be in agreement with the misleading information offered from the questionnaire.

The tolerance of ambiguity was also found to be predictive of accepting suggestive information. An individual who is unable to tolerate a high degree of ambiguity was more suggestible. In the item that produced significant results with ambiguity tolerance, the suggestive manipulation occurred prior to the event. Therefore, the encoding process was manipulated or altered for the experimental subjects. These subjects read a brief introduction depicting Marc as a bad boy prior to viewing the video. Upon watching the video, Marc was not

necessarily a bad boy. Those individuals with a low ambiguity tolerance rated Marc as a bad boy. The ambiguity associated with the encoding manipulation versus the actual event was strong enough to alter the memory of the event for these individuals.

Motivation, as outlined by Millon (1994), was not found to be predictive of suggestibility of memory for this sample. None of the motivational aims or drives was related to a tendency to the acceptance of misinformation. If motivation directs one's course of behavior, it would seem reasonable to assert that this would affect the information that was selected for encoding. Perhaps, the motivational aims described by Millon (1994) are unrelated to information processing and memory ability. Also, motivating aims may not be a characteristic that affects one's perception of conflicting inputs.

Although the study of individual personality characteristics has been scanty and inconclusive, there is a need to identify the personality traits predictive of suggestibility. The construction of a theoretical model describing the significant individual personality differences provides the future opportunity for prediction of eyewitness performance in an individual. At this point of researching individual personality differences, the Lindberg (1991) descriptive taxonomy depicted in Figure 1, page 7, may be helpful both to organize the existing

research and to identify the future research questions to be addressed. The use of a theoretical model may also permit researchers to share a common theoretical perspective and increase conceptual clarity in the field of eyewitness research.

Upon completion of this study, a descriptive model, as depicted in Figure 4, may be used to outline the conclusions. This model is similar to Lindberg's (1991) conceptualization as both figures illustrate the variables that affect suggestibility. Figure 4 is not presented as a static model but as a dynamic framework that may change as empirical research is conducted. At this time, the model includes an information-processing theory of memory that is embedded within the social context. For this study, the context involved different encoding manipulations and leading questions. The individual personality characteristics reacted to the context in order to evoke varied responses to the suggestive manipulation. The descriptive model identifies those characteristics that were found to be related to suggestibility. Future research may investigate additional areas of the social context, such as the setting for the event and additional individual differences.

The model portrayed in Figure 4 may also be used for future investigations dealing with the memory process. Each step of the information-processing model can be assessed to

Social Context

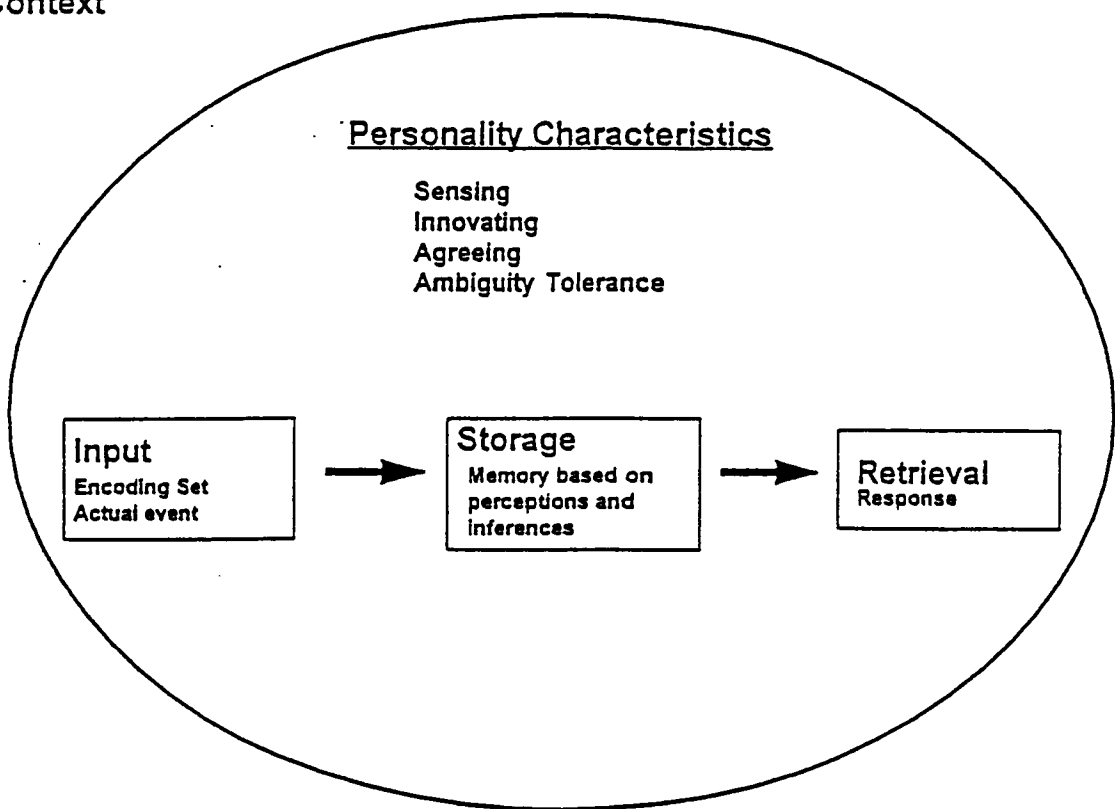


Figure 4. Descriptive Model of the Personality Characteristics Associated with Suggestibility of Memory based on Information-Processing Theory.

determine individual personality styles that are related to better memory of an event. At the time of encoding, it is necessary to select information that will be important for future recall. The individual's expectations and perceptions may affect this process. Personality styles may account for variation in the ability to attend to pertinent information. During the next step, the storage of information may be affected by inferences that are made by the individual. For example, ambiguity tolerance, as well as additional differences, may be associated with the tendency to make inferences about information being stored in memory. The final stage of retrieval is dependent on the accuracy of the first two processes. The ability to recall information and to communicate effectively that information is central to this area of research. This phase of the memory process is most frequently investigated, yet it has not been explained by determining how memory may be influenced by individual personality styles. The questions regarding the information-processing model are in need of further investigation to better understand the memory process.

This research study was one of the first steps in the process of identifying the individual characteristics that are predictive of being susceptible to accepting misleading information. Future research is needed to build on the descriptive taxonomy and reveal the processes related to

suggestibility of memory. Future research may yield not only theoretical benefits but more practical benefits as well. Although the present study offers the initiation of a theoretical foundation, a limitation to the study is the inability to offer at this time more practical implications. Currently, the field of eyewitness memory is inundated with studies investigating the memory process and offering suggestions for obtaining accurate eyewitness testimony. However, a great deal more research is needed to assess the conditions under which memory is more susceptible to accepting suggestive information. Differential cognitive processing should be investigated both to describe and to provide an explanation for these individual variations in performance. Future research in the area of eyewitness memory is necessary before individual personality characteristics associated with suggestibility of memory can be identified.

In conclusion, this research was an initial study in the identification of personality characteristics that may indicate a susceptibility to suggestibility of memory. The need to incorporate the research into a theoretical organizational scheme was emphasized. Findings of the present study were discussed in terms of potential theoretical implications.

LIST OF REFERENCES

REFERENCES

Aveling F., & Hargreaves, H. (1921). Suggestibility with and without prestige in children. British Journal of Psychology, 11, 53-75.

Baxter, J. (1990). The suggestibility of child witnesses: A review. Applied Cognitive Psychology, 4, 393-408.

Brainerd, C. & Ornstein, P. A. (1991). Children's memory for witnessed events: The developmental backdrop. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness memory (pp. 10-20). Washington, DC: American Psychological Association.

Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. Psychological Bulletin, 113(3), 403-439.

Ceci, S. J., Ross, D., & Toglia, M. (1987). Age differences in suggestibility: Psycholegal implications. Journal of Experimental Psychology: General, 117, 38-49.

Cohen, R. L., & Harnick, M. A. (1980). The susceptibility of child witnesses to suggestion. Law and Human Behavior, 4, 201-210.

Davies, G. (1991). Concluding comments. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness memory (pp. 177-187). Washington, DC: American Psychological Association.

Estabrooks, G. H. (1929). Experimental studies in suggestion. Journal of Genetic Psychology, 36, 120-139.

Flin, R. (1991). Commentary: A grand memory for forgetting. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness testimony (pp. 21-23). Washington, DC: American Psychological Association.

Freud, S. (1915). Instincts and their vicissitudes. In Collected papers (Vol. 4). London: Hogarth Press.

Freud, S. (1980). The ego and the id. New York: W.W. Norton and Company.

Gottman, J. M., & Roy, A. K. (1990). Sequential analysis: A guide for behavioral researchers. Cambridge: Cambridge University Press.

Gudjonsson, G. H. (1986). The relationship between interrogative suggestibility and acquiescence: Empirical findings and theoretical implications. Personality and Individual Differences, 7, 195-199.

Jung, C. G. (1931). Modern man in search of a soul. London: Kegan, Paul, Trench, Trubner & Company.

Kail, R., & Bisanz, J. (1992). The information-processing perspective on cognitive development in childhood and adolescence. In R. J. Sternberg, & C. A. Berg (Eds.), Intellectual development (pp. 229-260). Cambridge: Cambridge University Press.

Keirsey, D., & Bates, M. (1984). Please understand me: Character and temperament types. Del Mar: Prometheus Nemesis Book Company.

Kiefer, J. A. (1991). Personal experience and developmental level in eyewitness testimony for physical abuse. Unpublished master's thesis, Marshall University, Huntington, WV.

King, M. & Yuille, J. (1987). Suggestibility in the child witness. In S. J. Ceci, M. Toglia, & D. Ross (Eds.), Children's eyewitness memory (pp. 24-35). New York: Springer-Verlag.

Krech, D. & Crutchfield, R. S. (1948). Theory and problems in social psychological. New York: McGraw-Hill.

Lindberg, M. (1991) A taxonomy of suggestibility and eyewitness memory: Age, memory process, and focus of analysis. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness memory (pp. 47-55). Washington, DC: American Psychological Association.

Loftus, E. K. (1979a). Eyewitness testimony. Cambridge: Harvard University Press.

Loftus, E. K. (1979b). Reactions to blatantly contradictory information. Memory and Cognition, 7, 368-374.

Loftus, E. K., Miller, D., & Burns, H. (1978). Semantic integration of verbal information into a visual memory. Journal of Experimental Psychology: Human Learning and Memory, 4, 19-31.

MacDonald, A. P. (1970). Revised scale for ambiguity tolerance: Reliability and validity. Psychological Reports, 26, 791-798.

Millon, T. (1994). Millon index of personality styles. San Antonio: The Psychological Corporation.

Myers, I. B. (1962). The Myers-Briggs Type Indicator. Palo Alto, CA: Consulting Psychologists Press.

Norusis, M. J. (1990). Logistic regression analysis: Procedure logistic regression. In SPSS advanced statistics user's guide (pp. 44-69). Chicago: SPSS Inc.

Prideaux, E. (1919). Suggestion and suggestibility. British Journal of Psychology, 10, 228-241.

Prosen, S. S. (1980). Ambiguity tolerance. In R. H. Woody (Ed.), Encyclopedia of clinical assessment. San Francisco, CA: Jossey-Bass.

Remmers, H. H., Cutler, M., & Jones, P. (1940). Waking suggestions in children: General or specific? Journal of Genetic Psychology, 56, 87-93.

Rogoff, B. (1990). Apprenticeship in thinking: Cognitive development in social context. New York: Oxford University Press.

Rydell, S. T. (1966). Tolerance of ambiguity and semantic differential ratings. Psychological Reports, 19, 1303-1312.

Schooler, J. W., & Loftus, E. K. (1993). Multiple mechanisms mediate individual differences in eyewitness accuracy and suggestibility. In J. M. Puckett & H. W. Reese (Eds.), Mechanisms of everyday cognition (pp. 177-203). Hillsdale: Lawrence Erlbaum Associates.

Thomas, R. M. (1992). Comparing theories of child development. Belmont: Wadsworth Publishing.

Ward, R. A., & Loftus, E. K. (1985). Eyewitness performance in different psychological types. The Journal of General Psychology, 112, 191-200.

Wilson, E. O. (1978). On human nature. Cambridge: Harvard University Press.

Zaragoza, M. (1991). Preschool children's susceptibility to memory impairment. In J. Doris (Ed.), The suggestibility of children's recollections: Implications for eyewitness memory (pp. 27-39). Washington, DC: American Psychological Association.

APPENDIXES

APPENDIX A

CONSENT FORMS

INFORMED CONSENT FORM

I have been informed of the nature of "The Memory Process" research project. Its major purpose is to assess my ability to remember details following a short film.

I understand that the information will be confidential, kept in locked cabinets and used only for research purposes. No names will be used in reporting the results in conferences or publications. The list linking my name and subject number will be destroyed upon completion of the project.

I understand that there is a benefit from my participation in this project. Upon completion of this research, the results of the personality assessment will be made available by the project director.

I understand that there are no anticipated risks from participating in this study. If I become stressed during the session, I may terminate my participation and report this to the project director.

I understand that participation is voluntary and I will not be penalized for withdrawal. I may choose not to participate or to withdraw from the study at any time. Credit will only be given for completion of both thirty minute sessions. At the end of the semester, my instructor will only be notified if I have completed both sessions.

I give my consent to participate in this project.

I understand that information about the research project or a summary of the results may be obtained from Cheryl Webb or Dr. Connie Steele, Child and Family Studies, 115 Jessie Harris Building, The University of Tennessee, Knoxville, 974-5316.

Name (Please print)_____

Signature_____

Please circle the name of the class for which you are receiving participation credit:

CFS 210

CFS 300

ID 200

APPENDIX B

PERSONAL DATA QUESTIONNAIRES

PERSONAL DATA SHEET

For the following items, select the appropriate response and write the corresponding number in the space provided:

Gender:

- (0) Male
- (1) Female

Race:

- (0) White (not of Hispanic origin)
- (1) Black (not of Hispanic origin)
- (2) Hispanic
- (3) Asian or Pacific Islanders
- (4) American Indian or Alaskan Native

Age:

Year in college:

- (1) Freshman
- (2) Sophomore
- (3) Junior
- (4) Senior
- (5) Graduate
- (6) Other

College:

- (0) Agriculture
- (1) Architecture
- (2) Business Administration
- (3) Communications
- (4) Education
- (5) Engineering
- (6) Human Ecology
- (7) Liberal Arts
- (8) Nursing
- (9) Social Work

Major: _____

Cumulative GPA: _____

Mother's employment status:

- (0) Full-time
- (1) Part-time
- (2) Unemployed

Father's employment status: _____

- (0) Full-time
- (1) Part-time
- (2) Unemployed

Estimated parents' annual income: _____

- (1) \$10,000 and under
- (2) \$10,000 - 25,000
- (3) \$25,000 - 50,000
- (4) \$50,000 - 75,000
- (5) \$75,000 - 100,000
- (6) \$100,000 and above

During your childhood, which of the following describes the marital status of the adults who lived in your home: _____

- (0) Single parent household
- (1) Biological parents were married
- (2) Biological parents were divorced
- (3) Biological parent was widowed
- (4) Biological parent was married to and living with non-biological parent
- (5) Biological parent was living with but not married to an adult other than the biological parent

Number of biological brothers: _____

Number of biological sisters: _____

Number of step-brothers: _____

Number of step-sisters: _____

Your birth order: _____

- (0) Only child
- (1) First born
- (2) Second born
- (3) Third born
- (4) Forth born, etc.

Your marital status: _____

- (0) Single
- (1) Married
- (2) Divorced
- (3) Separated
- (4) Widowed

APPENDIX C

MEMORY QUESTIONNAIRES

Memory Questionnaire 0

1. Overall, how good a person was the younger boy Marc?

Very bad 1	Somewhat Bad 2	Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------------------	----------	-----------------------	-----------	-------------------

2. Overall, how good a person was the older boy?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

3. Overall, how good a person was the mother?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

4. Write the three main things you remember happening in the video.

1)

2)

3)

5. In one sentence, describe the Nintendo video game that Marc was playing.

6. How sure are you about the video game?

not at all sure 1	not sure 2	somewhat not sure 3	somewhat sure 4	sure 5	very sure 6
-------------------------	------------------	---------------------------	-----------------------	-----------	-------------------

7. What did the mother's note say?

Suggestibility and Personality 78

8. How sure are you about what the note said?

not at all sure	not sure	somewhat not sure	somewhat sure	sure	very sure
1	2	3	4	5	6

9. What snack was Marc eating? (Marc was the younger boy who was playing video games.)

10. What was Marc saying when the mother went over to him and had him stand up?

11. What was the mother saying as she was taking Marc to the kitchen?

12. Why were the boys late getting home from school?

13. How sure are you about why the boys were late getting home?

not at all sure	sure	not sure	somewhat not sure	somewhat sure	sure	6	very sure
1		2	3	4	5		

14. What did the older boy go to do while the younger boy was playing video games?

15. How sure are you about what the older boy went to do?

not at all sure	not sure	somewhat not sure	somewhat sure	sure	very sure
1	2	3	4	5	6

16. What was in the bags of groceries that the mother was carrying?

Memory Questionnaire 1

1. Overall, how good a person was the younger boy Marc?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

2. Overall, how good a person was the older boy?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

3. Overall, how good a person was the mother?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

4. Write the three main things you remember happening in the video.

1)

2)

3)

5. In one sentence, describe the Nintendo video game that Marc was playing.

6. How sure are you about the video game?

not at all sure 1	not sure 2	somewhat not sure 3	somewhat sure 4	sure 5	very sure 6
-------------------------	------------------	---------------------------	-----------------------	-----------	-------------------

7. What did the mother's note say?

8. How sure are you about what the note said?

not at all sure	not sure	somewhat not sure	somewhat sure	sure	very sure
1	2	3	4	5	6

9. What snack was Marc eating? (Marc was the boy who ignored his mother and made her do all of the work.)

10. What was Marc saying when the mother had him stand up after he repeatedly ignored her and tried to make her mad?

11. What was the mother saying as she was taking Marc to the kitchen where she went to wipe the blood coming from his bloody nose?

12. Why were the boys late getting home from school?

13. How sure are you about why the boys were late getting home?

not at all sure	not sure	somewhat not sure	somewhat sure	sure	very sure
1	2	3	4	5	6

14. What did the older boy go to do while the younger boy was playing video games?

15. How sure are you about what the older boy went to do?

not at all sure	not sure	somewhat not sure	somewhat sure	sure	very sure
1	2	3	4	5	6

16. What was in the four bags of groceries that the mother was carrying?

Memory Questionnaire 2

1. How hard was Marc hit?

not hit at all 1	hit much less hard 2	hit somewhat less hard 3	hit somewhat harder 4	hit much harder 5	hit really hard 6
---------------------------	-------------------------------	-----------------------------------	--------------------------------	----------------------------	----------------------------

2. How hard did Marc deserve to get hit?

not hit at all 1	hit much less hard 2	hit somewhat less hard 3	hit somewhat harder 4	hit much harder 5	hit really hard 6
---------------------------	-------------------------------	-----------------------------------	--------------------------------	----------------------------	----------------------------

3. How many drops of blood fell from Marc's nose?

0 1 2 3 4 5 6 or more

4. How many times did the mother hit Marc?

0 1 2 3 4 5 6 or more

5. How many times did the mother hit the other boy?

0 1 2 3 4 5 6 or more

6. In one sentence, explain why the mother hit Marc.

7. How many bags of groceries was the mother carrying?

0 1 2 3 4 5 6 or more

8. How sure are you about your answer on how many bags of groceries the mother was carrying?

not at all sure 1	not sure 2	somewhat not sure 3	somewhat sure 4	sure 5	very sure 6
-------------------------	------------------	---------------------------	-----------------------	-----------	-------------------

9. Overall, how good a person was the younger boy Marc?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

10. Overall, how good a person was the older boy?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

11. Overall, how good a person was the mother?

Very bad 1	Bad 2	Somewhat Bad 3	Somewhat Good 4	Good 5	Very Good 6
------------------	----------	----------------------	-----------------------	-----------	-------------------

12. Why were the boys late? (Circle all that apply.)

- 1) They missed the bus
- 2) They goofed around on their way home.
- 3) The bus broke down.
- 4) Their mother forgot to pick them up at school.

13. How sure are you that your answer is correct on why the boys were late getting home?

not at all sure 1	not sure 2	somewhat not sure 3	somewhat sure 4	sure 5	very sure 6
-------------------------	------------------	---------------------------	-----------------------	-----------	-------------------

14. What did the older boy go to do while Marc played video games?
(Circle all that apply.)

- 1) Go to a friend's house.
- 2) Go to do his homework.
- 3) Go to call his girlfriend.
- 4) Go to watch another television.
- 5) Go to call a friend.

15. How sure are you about what the older boy went to do?

not at all sure 1	not sure 2	somewhat not sure 3	somewhat sure 4	sure 5	very sure 6
-------------------------	------------------	---------------------------	-----------------------	-----------	-------------------

16. What snacks did the boys eat? Write brand names if you can remember them.

APPENDIX D

AMBIGUITY TOLERANCE QUESTIONNAIRE

Please do not spend too much time on the following items. There are no right or wrong answers and therefore your first response is important. Using the scale below, write the appropriate number in the blanks beside each statement. Be sure to answer every question.

1	2	3	5	6	7
Strongly	Moderately	Slightly	Slightly	Moderately	Strongly
Agree	Agree	Agree	Disagree	Disagree	Disagree

- _____ 1. A problem has little attraction for me if I don't think it has a solution.
- _____ 2. I am just a little uncomfortable with people unless I feel that I can understand their behavior.
- _____ 3. There's a right way and a wrong way to do almost anything.
- _____ 4. I would rather bet 1 to 6 on a long shot than 3 to 1 on a probable winner.
- _____ 5. The way to understand complex problems is to be concerned with their larger aspects instead of breaking them into smaller pieces.
- _____ 6. I get pretty anxious when I'm in a social situation over which I have no control.
- _____ 7. Practically every problem has a solution.
- _____ 8. It bothers me when I am unable to follow another person's train of thought.
- _____ 9. I have always felt that there is a clear difference between right and wrong.
- _____ 10. It bothers me when I don't know how other people react to me.
- _____ 11. Nothing gets accomplished in this world unless you stick to some basic rules.
- _____ 12. If I were a doctor, I would prefer the uncertainties of a psychiatrist to the clear and definite work of someone like a surgeon or x-ray specialist.

- _____13. Vague and impressionistic pictures really have little appeal for me.
- _____14. If I were a scientist, it would bother me that my work would never be completed (because science will always make discoveries).
- _____15. Before an examination, I feel much less anxious if I know how many questions there will be.
- _____16. The best part of working a jigsaw puzzle is putting in the last piece.
- _____17. Sometimes I rather enjoy going against the rules and doing things I'm not supposed to do.
- _____18. I don't like to work on a problem unless there is a possibility of coming out with a clear-cut and unambiguous answer.
- _____19. I like to fool around with new ideas, even if they turn out later to be a waste of time.
- _____20. Perfect balance is the essence of all good composition.

VITA

Cheryl K. Webb, daughter of Danny and Carolyn Webb, was born in Honolulu, Hawaii on November 12, 1967. She attended elementary school in Ona, West Virginia and graduated from Milton High School in 1986. In 1985, she entered Marshall University, and in December 1988 she received a Bachelor of Arts degree in elementary education. In the Fall of 1989, she entered the Master's program at the University of Tennessee, Knoxville in the College of Human Ecology. She reentered the University of Tennessee, Knoxville in the Fall of 1993. She completed the requirements for the Doctor of Philosophy degree in Human Ecology and graduated in December, 1994.

The author is a member of the Society for Research in Child Development, the Society for the Psychological Study of Social Issues, the National Council on Family Relations, the National Association for the Education of Young Children, and the Southwestern Society for Research in Human Development. She is presently Program Director for the Court Appointed Special Advocacy program in Blount County, Tennessee.