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The effect of self-generated information on the plausibility of unlikely autobiographical events

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THE EFFECT OF SELF-GENERATED INFORMATION
ON THE PLAUSIBILITY OF UNLIKELY
AUTOBIOGRAPHICAL EVENTS

by

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Bachelor of Arts
University of Nevada, Las Vegas
1997

Master of Arts
University of Nevada, Las Vegas
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A thesis submitted in partial fulfillment
of the requirements for the

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Department of Psychology
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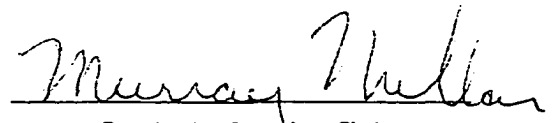
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The Effect of Self-Generated Information on the

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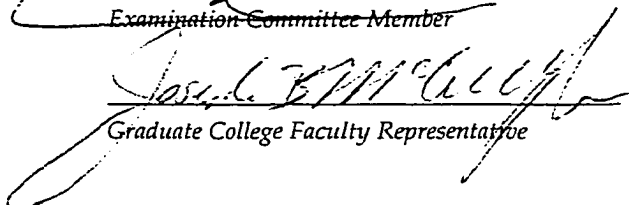
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ABSTRACT

The Effect of Self-Generated Information on the Plausibility of Unlikely Autobiographical Events

by

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Plausibility of unlikely events was investigated using a pre-test and post-test of the Life Events Inventory (Garry, et al, 1996). Students (N = 55) at the University of Nevada, Las Vegas completed two sessions, including a plausibility scenario phase in which they were asked to describe four events chosen by the researcher from the pre-test on the basis of reported plausibility. Two of the events were rated low in plausibility and two were rated high in plausibility. Results indicate that plausibility ratings increase more for low rated items when participants are asked to describe those items than for control items which are not described.

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CHAPTER 1

INTRODUCTION

Our sense of who we are is largely determined by memories of what has happened in our lives. Although this point is generally accepted by psychologists, there are disagreements about the accuracy of memories. Most recently, the recovered memory debate has focused on whether “recovered” memories of childhood abuse are accurate or not. The debate was stirred by court cases involving victims who claimed to have been abused and to have forgotten the abuse, only to remember it at a later time (Loftus & Ketcham, 1994). In several cases, the defendants were convicted on the basis of this recovered memory alone (Loftus, 1993). A number of researchers challenged the validity of these claims by pointing to studies that have consistently shown memory to be inaccurate in many situations. For instance, research on eyewitness suggestibility has routinely found that participants can be induced to claim that they saw objects during a witnessed event that were, in fact, only suggested to them in the context of post-event questioning (e.g., Loftus, Miller, & Burns, 1978; Zaragoza & Lane, 1995). However, other researchers have suggested that traumatic memories may be exempt from these inaccuracies because they are encoded using different mechanisms than those used in everyday memories (van der Kolk & Fisler, 1995). Clinicians have also suggested that memories of abuse are too traumatic to fabricate, and that reported childhood abuse is generally accompanied by other behavioral problems which have been linked to that

abuse. Thus, a central question in this debate is whether it is possible for someone to falsely remember an event that never occurred.

Memory Creation

A number of researchers claim to have evidence that memories of whole events can be implanted. For instance, Elizabeth Loftus (1993), attempted to implant a memory of being lost in a mall in one person, a young man named Chris. She enlisted Chris's brother to tell him that he had been lost in a mall and rescued by an old man when he was about five years old. Chris reported what he remembered every day in a diary, and after a few weeks he had created a vivid memory of this experience. His memory included emotional and contextual information such as his fear at being lost and a description of the man who helped him find his family. Chris also rated his memory for this false event as being very clear, with higher clarity ratings than he gave to true memories that had occurred in his childhood. This procedure was replicated with slight modifications for a larger group of participants (Loftus & Pickrell, 1995). The suggested event, again, was being lost in a mall as a young child. The subjects' parents were asked to provide information about a typical shopping trip, including where the shopping trip took place, what kind of stores were visited, and which family members were likely to have gone on this type of shopping trip. The parents also verified that the subject had not been lost in a mall as a young child. Using this information, a scenario was presented to the subjects, who were told that their parents had reported this event as something that really happened and were asked to try to remember the experience. Overall, 25% of the subjects claimed to have a memory of the event.

Loftus' findings were criticized on the grounds that subjects may have been remembering an actual incident when they were lost, because this experience is not at all unusual for children. In a similar manipulation which addressed this criticism, Hyman, Husband, & Billings (1995) responded by attempting to implant memories for events that were unlikely to have occurred. A false positive event or a false negative event was suggested to each participant. The positive event was a birthday party at age five with pizza and a clown. The negative event was an overnight visit to a hospital at age five with a high fever and possible ear infection. The parents of participants were polled to determine a number of true events and to determine whether or not the events to be suggested had happened. The participants were interviewed twice, with requests to try to remember a number of events, one of which had never happened to them. By the second interview, 20% of the subjects had created a description of the false event. The same number of false positive and negative events were described, that is, there was no indication that emotional context affects whether or not a suggested event will be described as a true event. Furthermore, participants who created a description of a false event could not accurately identify this event as false from the original list of events while individuals who did not create a description of a false event were able to accurately indicate which event from the original list was false.

The consistency of results from these two early memory creation studies suggested that memory creation is, in fact, possible, and later research has attempted to examine factors that increase or decrease the likelihood of falsely remembering an autobiographical event. One possible factor affecting memory creation is the source of suggestion. Both of the aforementioned studies include telling the participants that a family member had reported the event as a true event. This may provide the suggested information with an element of

credibility. Additional identified factors include individual differences (Hyman & Billings, 1995), use of guided imagery (Hyman & Pentland, 1996), and production of self-relevant information at the time of the memory description (Hyman, Husband, & Billings, 1995).

Because a minority of participants come to believe the suggestions, one possibility is that those who accept the suggestions differ in some way from those who do not. Personality variables have been explored with regard to their relation to memory creation. For example, in Hyman & Billings (1998) participants completed four personality measures, the Creative Imagination Scale (CIS) (a measure of hypnotizability), the Tellegen Absorption Scale (TAS), the Dissociative Experiences Scale (DES), and the Marlowe-Crowne Social Desirability Scale (SDS). Similar to earlier studies, information about participants' past experiences was received from their parents. The participants were then asked to describe all they could remember about a small number of true events and one false event. They were then scheduled for a second interview and asked to continue thinking about the events. Results show that both scores on the CIS and the DES were highly related to the creation of false memory, while scores on the TAS and SDS were not. Although the CIS hypothetically measures hypnotizability, the scale instructs individuals to use creative imagination. Thus, whether one or both of these factors affects memory creation is not clear. In fact, both factors have been implicated in other types of false memory. For instance, imagery has been linked to misremembering in eyewitness studies. Additionally, research in hypnosis suggests that individuals in a hypnotic state are more suggestible to false information than those not in a hypnotic state. (Lynn & Nash, 1994). The DES has been shown to be a reliable indicator of dissociative tendencies (Bernstein & Putnam, 1986). Dissociation has been linked, not only to

memory creation, but also to fantasy proneness. Lynn & Nash, (1994) suggest that susceptibility to leading questions is higher in fantasy-prone individuals. Hyman presents another explanation which is that individuals who have higher scores on dissociation may be more willing to use constructive memory processes, which in turn could contribute to the memory creation process.

Although individual differences can affect the likelihood of falsely remembering an autobiographical event, individual characteristics are only one part of memory creation. The manner in which individuals examine and process the suggested information has also been implicated as a factor. The effect of imagery has been addressed by Hyman & Pentland (1996) in a typical memory creation paradigm. Again, several true events and one false event were presented. However, the instructions given to one group for the false event were to form a mental image of the event, then to describe this mental image. The second group was instructed only to think about the false event quietly for a moment. For the first group, the results are similar to earlier memory creation studies in that 25% of these participants falsely remembered the suggested event. In the second group only 9% of these participants falsely remembered the event. The stronger direction to imagine in the first group induced greater memory creation, which indicates that imagery may affect false memories. However, the use of imagery does not fully explain memory creation because highly unusual events may not be falsely remembered even when imagined vividly and presented with credible sources. Therefore, the suggested information also has to connect in some other way, perhaps to existing autobiographical schemas or scripts in memory.

One exploration of the role of autobiographical scripts is found in an attempt to persuade Catholic students that they had experienced a Jewish ritual and to persuade Jewish students that they had experienced a Catholic ritual (Pezdek, Finger, & Hodge, 1997). As expected, the participants in this study proved highly resistant to the suggested event, even though they were told that their parents had supplied the information. To clarify this manipulation, the suggested information was presented in such a manner that the names of the rituals or associated objects were not included. Therefore, we can assume that in order for a memory to be created surrounding a suggested event, that event has to contain elements that we view as possible, given the constraints of our autobiographical experiences and memories. This factor has been subject to some debate, because it has not yet been determined how well-developed a script for an event must be in order for individuals to create a memory surrounding that event. Furthermore, evidence suggests that personal experience is not necessary for the development of scripts (Holst & Pezdek, 1992).

The existence of autobiographical scripts in memory may interact closely with another factor which affects the creation of a memory, that is, the production of self-relevant information at the time of the memory report. Additional research suggests that the more self-relevant information an individual produces is linked to higher rates of false memory creation (Hyman & Pentland, 1996). These two factors may be linked because the act of producing the self-relevant information can facilitate the connection of suggested information to similar existing autobiographical scripts. Hyman reasons that the act of memory creation is a constructive process combining suggested events with self-knowledge, which could further explain the effects seen when individuals produce more self-relevant information at the time of the memory report.

Memory Creation Model

The current state of memory creation work indicates that memory creation is possible. Further, research suggests that memory creation appears to have some relation to individual differences such as personality characteristics (e.g., hypnotizability and dissociativity). Memory creation is also likely to be subject to constraints of autobiographical memory scripts. A means of consolidating the existing knowledge regarding memory creation has been suggested by Ira Hyman. In his memory creation model, there are three steps which seem to apply to most cases of memory creation. Initially, an individual has to judge presented information as plausible. It appears to be difficult to implant memories that “fly in the face” of an individual’s history. Hyman suggests at least two other elements to memory creation. Individuals have to provide an image and narrative to accompany the memory such that the event has to be elaborated to include details about the event had it occurred. Finally, people must mistakenly believe that the narrative describes a real event that happened to them. Hyman refers to this last element as a source misattribution error. This model suggests that researchers can focus on separate aspects of the memory creation process. One example is provided by studies investigating the role of plausibility in memory creation. Because the proposed study will focus on plausibility, the following discussion provides a review of the research on this aspect of memory creation.

Plausibility

Plausibility studies differ from memory creation studies in that the dependent variable is a plausibility rating rather than a memory judgement. The primary tool used in these studies is the Life Events Inventory (LEI). This scale presents a number of events that

may or may not have happened before the age of ten. Events on this scale range from probable (e.g., got sick at school), to improbable (e.g., felt an earthquake). The scale asks individuals to rate the events from one to eight, with one indicating that the event definitely did not happen and eight indicating that the event definitely did happen. The points in between represent intermediate levels of uncertainty, or plausibility. Therefore, events rated between the end anchors will be events which the subject cannot state with certainty whether they did or did not happen.

Although plausibility is studied in a slightly different manner than memory creation, research does indicate that many factors which affect memory creation also affect plausibility. One similarity between these two types of studies is that they both use endorsement by a credible source (Loftus, 1997, Mazzoni, et al., 1999). Information that a family member reports as true may be seen by individuals as reliable information. Additionally, the same individual differences which affect memory creation have also been implicated to be a factor in plausibility (Heaps & Nash, 1999). Finally, imagining a suggested event is also a primary component of plausibility studies, and may influence plausibility ratings (Garry, et al., 1996).

Recently, the LEI has been used by Garry et al. (1996) to investigate an effect they call imagination inflation. This is the tendency of individuals to inflate plausibility ratings after imagining an event. In their study, participants first completed the LEI and then were asked to imagine four target events (e.g. gave someone a haircut, broke a window with your hand). A brief description of the event was provided, along with prompts about what type of information the subjects might imagine. Finally, the participants were asked questions about what they had imagined. The results of this study show a trend for higher plausibility ratings for imagined than non-imagined events.

Specifically, positive changes in the LEI ratings, collapsed across all subjects, were 9% higher for the imagined events than for the non-imagined events. The magnitude of this change is not large, however, it does indicate that imagining events has an effect on plausibility.

Later studies have examined other factors that affect plausibility. For instance, Mazzoni, et al. (1999) examined whether or not the context of the imagination phase has an effect on plausibility. The method was similar to the previous imagination inflation study in that participants were initially given the LEI, however, in this study the true purpose was masked by requesting participation in an entirely different study. For that study they were asked to record one of their dreams. When they brought in their dream record, they met with a clinical psychologist who suggested to them that the dream was indicative of experiencing a childhood event. The suggested childhood event was one of the target items chosen from the initial administration of the LEI. Follow-up interviews including a second administration of the LEI found that participants rated the suggested event as more plausible on the second LEI than they had on the first. The evidence suggests that a credible source can affect plausibility ratings.

Heaps & Nash (1999) used the imagination inflation paradigm to examine the effect of individual differences on imagination inflation. The results are remarkably similar to Hyman & Billings' (1995) findings regarding memory creation and individual differences. Imagination inflation was more likely to occur in individuals with higher scores on scales of hypnotic suggestibility and dissociation. The authors conclude that imagination inflation effects may be partially due to stable, intrinsic cognitive abilities.

Although these studies all include instruction to imagine an event, generally, the created image involves the individual who is imagining it. Manning, et al. (2000) found

that even when participants were asked to imagine the event happening to someone with whom they closely identified instead of happening to themselves, imagination inflation remained high for imagined events. Furthermore, when participants were asked to imagine events happening to someone with whom they did not identify at all, imagination inflation still remained high for imagined events. These results suggest that a very influential aspect of imagination inflation is the act of imagining the event, and that who is in the imagined event is not important. This may indicate that the information contained within the images is not nearly as important as the creation of those images.

The Present Study

In view of the evidence, the goal of the present study is to determine if plausibility ratings are affected by self-generated information. The previously reported plausibility work suggests that plausibility ratings can be elevated by imagining an event (Garry, et al. 1996), by exposure to suggestion by a credible source (Mazzoni, et al. 1999), or by the presence of certain personality variables (Heaps & Nash, 1999). Memory creation studies indicate that the creation of a memory is a process also affected by the suggestion of a credible source (Loftus, 1997), by guided imagery (Hyman & Pentland, 1996), or by individual differences (Hyman, Billings, & Husband, 1990). Factors which affect plausibility, with the exception of individual differences, are fairly direct suggestive techniques which appear to also affect memory creation. However, the magnitude of the effects found in plausibility studies is not very large. One possible explanation is that in directing individuals to imagine events researchers may provide additional information which bears little or no resemblance to anything the individual has experienced. Participants may also show high plausibility ratings if they are allowed to fill in the

details from similar events they have experienced. Therefore, the present study used a very subtle suggestion. Participants were simply asked to describe a target event with minimal input from the researcher. Rather than being directed to imagine the event, they were instructed to describe the event as it might have happened to them. The type of instruction used in earlier studies is not the only modification in the present study.

A criticism of earlier work is the difficulty of using traditional statistical analysis in the analysis of LEI scores. Because the target items are chosen prior to seeing how people respond to those items, there is no consistency in scores across the sample; for example, pre-chosen target items can receive any score between one and eight. The present study chose target items for each participant after the participant had completed the scale. This allowed target items to be chosen by virtue of the reported score, therefore, the target items were all items which were rated similarly.

Another concern regarding plausibility studies is that the effects seen may arise from familiarity. If familiarity is responsible for higher plausibility ratings, then the results become more difficult to interpret because events may not become more plausible but simply more familiar. To address this problem the present study introduced related but novel items on the second administration of the LEI. The responses to these items should not be affected by familiarity. These related items may also indicate the stability of plausibility. If plausibility is high for items related to but distinct from the target items, it may indicate that plausibility can generalize to similar items.

The purpose of the present study is to investigate the effect of self-generated information on plausibility ratings of events. Participants took the LEI, and after a one-week delay they returned for the plausibility scenario phase and the second administration of the LEI. The instructions to participants were minimal, simply to

describe the event as it might have happened to them. The second LEI included novel yet related events.

Modifying earlier studies in these ways may respond to criticisms or problems of those studies. This study has two hypotheses. First, it is hypothesized that the self-generation of information regarding implausible autobiographical events will lead to an increase in plausibility ratings. Second, it is hypothesized that plausibility ratings will increase for novel, related items as well as for original items. This finding could support the suggestion that memory is a very constructive process, and suggested events may facilitate the acceptance of similar events as possible.

CHAPTER 2

METHOD

Participants

Participants were undergraduate students at the University of Nevada, Las Vegas. Extra course credit was offered for their participation. Sixty-seven individuals completed the first phase of the study, and fifty-five individuals (42 women and 13 men) returned to complete the second phase.

Materials

A 20-item Life Events Inventory (LEI)(Appendix A), developed and modified from the original 40-item scale by Garry, et al. (1996) was used in the first session. The items describe events to which the participant is asked to rate on a scale from one (definitely did not happen) to eight (definitely did happen) whether or not the event happened to them before the age of ten. One item was modified for the purposes of this study. The item originally read "shook hands with the President," and due to the relative infrequency of that event occurring was changed to "shook hands with a famous person." Four target items from the 20-item LEI were chosen for each participant, these items were two low plausibility (ratings of 2 or 3) and two high plausibility items (ratings of 6 or 7).

The post-test LEI (Appendix B) was revised to include one related item for each original item. Five related items for each original item were chosen by the

researcher and pre-tested on a group who were asked to rank the relatedness of those five items to the original item. The related item with the highest average relatedness ranking was chosen for inclusion in the post-test. For example, the original item “got sick while at school” was most closely related to the item “were sent to the nurse’s office,” which was then included on the revised LEI. The 40 items were randomized for the revised LEI, and all original LEI items were included in this version.

Procedure

All participants engaged, individually, in two sessions. During the first session the individual filled out the 20-item LEI and a demographic sheet (e.g., age, gender, student status). After completing the scale, they were scheduled for a second session at least one week later. In the interim, the target items for each participant were chosen by the researcher, dependent upon the individual’s original responses. Two high plausibility and two low plausibility items were used in the plausibility scenario phase of the study.

The plausibility scenario phase took place during the second session, at least one week after the first. Participants were told that four events had been chosen at random from their original LEI. The presentation of high plausibility items and low plausibility items was alternated so that every other participant described both high plausibility items first and both low plausibility items second. This procedure was reversed for the rest of the participants. They were then given instruction that for each event presented to them, they were to describe it as if it had happened to them, though some of the events may have been events they indicated had probably not happened to them. If the participant had difficulty describing an event, they were prompted with additional suggestions

concerning what type of information they could report about the memory. Most of the participants had very little difficulty describing events that did not happen to them.

After the participants described the events, they were given a word puzzle to work on for five minutes. Finally, participants were given the revised LEI and debriefed.

CHAPTER 3

RESULTS

Demographic information about the sample includes age, gender, current college status and marital status. The sample primarily consisted of single females between the ages of 21 and 25 in their junior year of college. Seventy-five percent of the sample listed English as their first language.

Table 1

General Demographic Data

<u>Primary Grouping</u>	<u>Subgroup</u>	<u>N</u>	<u>%</u>
Gender	Male	13	23.6
	Female	42	76.4
Age	16-20	22	40.0
	21-25	26	47.3
	26-30	5	9.1
	36-40	1	1.8
	40+	1	1.8
Year in College	Freshman	4	7.3
	Sophomore	10	18.2
	Junior	25	45.5
	Senior	16	29.1
English as first language	Yes	41	74.5
	No	14	25.5

The results of this study have similarities to other studies of this type using the Life Experiences Inventory (Garry, et al, 1996, Hyman & Pentland, 1996). Individuals who were exposed to the manipulation subsequently showed change in their ratings of those events. A simple examination of means for pre-test and post-test scores on all three conditions indicate that low plausibility items had the highest degree of change, high plausibility items had only a small degree of change, and control items showed almost no change at all. Recall that the high and low plausibility items were chosen because the participants indicated the events probably had or had not happened to them, therefore, the differences in the pre-test scores are expected. However, the most dramatic change did occur in the case of low plausibility items which supports the hypothesis that the plausibility scenario would lead to higher post-test estimations of plausibility.

Further analysis using a repeated measures ANOVA reveals a significant interaction between test and condition, $F(2, 108) = 10.31$, $MSE = 2.739$, $p < .01$. The simple effect for low plausibility items was significant, $F(1, 54) = 16.50$, $MSE = 2.739$, $p < .01$. The high plausibility items and the control items were non significant. These results are as expected, and support the hypothesis that the self-generation of information can cause the same type of effects as more structured imagination exercises.

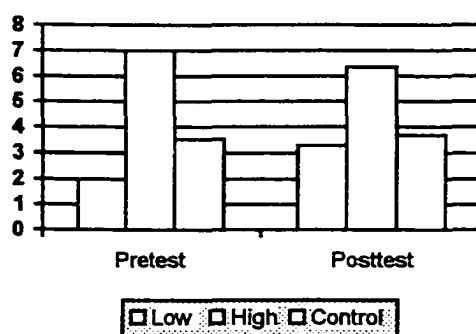


Figure 1. Mean scores on pre-test and post-test for low plausibility, high plausibility, and control items.

The above analyses were run on all items within the three groups with no regard to item. While these results do provide support for the hypothesis, there is much variation in the items chosen as targets, and in the types of movement seen on those items. Further analyses examined these factors. A table showing the low plausibility condition responses indicates that 38% of the responses increased from the pre-test to the post-test, 25% of the responses decreased, and 36% of the responses stayed the same. The average increase was 3.98 points (out of an eight point scale) and the average decrease was 1.55. The above percentages also indicate subgroups in the sample, that is, 38% of respondents increased their rating of plausibility as a result of the manipulation. This finding is slightly higher than the findings of other studies, which typically find 25% of the respondents' ratings increase as a result of imagining the events. One possible explanation for the higher percentage of respondents who view events as more plausible when they generate information about the event themselves is that the information they generate is more likely to fit their autobiographical schemas than information given to them by researchers.

Table 2

Low Plausibility Item Responses

Item	# Sub	# Increase	Ave. Pts.	#Decr.	Ave. Pts.	# Same
Low Pl. 1	2	2	4	-	-	-
Low Pl. 2	2	1	.66	1	.5	-
Low Pl. 3	9	2	4	3	1	4
Low Pl. 4	14	4	3	4	1	6
Low Pl. 5	1	-	-	-	-	1
Low Pl. 6	5	1	4	2	1	2
Low Pl. 7	3	1	6	2	.66	-
Low Pl. 8	1	1	4	-	-	-
Low Pl. 9	11	2	3	3	1.66	6
Low Pl. 10	15	8	3.5	2	1	5
Low Pl. 11	2	1	1	1	5	-
Low Pl. 12	1	-	-	-	-	1
Low Pl. 13	13	6	6.16	3	1.33	4
Low Pl. 14	5	-	-	1	2	4
Low Pl. 15	-	-	-	-	-	-
Low Pl. 16	4	2	5	2	2	-
Low Pl. 17	-	-	-	-	-	-
Low Pl. 18	14	7	3.42	2	2	5
Low Pl. 19	3	2	5.5	-	-	1
Low Pl. 20	5	2	6.5	2	1	1
Totals	110	42	3.98	28	1.55	40

Note. #Sub = how many subjects chose that item as a target item; # Increase = how

many subjects increased their plausibility estimate; # Decrease = how many subjects

decreased their plausibility estimate; # Same = how many subjects showed no change in

their plausibility estimate. Ave. Pts. = the average amount of change on each item.

The same example for control items shows that responses on these items increase for 19% of the responses, decrease for 15% of the responses, and remain the same for 65% of the responses. There is much less movement on the scale for control items, though the average increase was 2.79 points and the average decrease was 2.68. These numbers may simply be the result of a small number of individuals who changed their rating dramatically, however, the most important result is that 65% of the control items

showed no change between pre-test and post-test. This can be contrasted with the finding on low plausibility items where only 38% of the items showed no change between pre-test and post-test.

Table 3

Control Item Responses

Item	# Sub	# Increase	Ave. Pts.	# Decr.	Ave. Pts.	# Same
Control 1	43	6	3.83	8	2.37	29
Control 2	50	12	3.66	11	2.72	27
Control 3	42	8	2.87	7	2.42	27
Control 4	33	9	2.66	4	2.25	20
Control 5	46	8	3.62	9	1.77	29
Control 6	47	11	3.27	6	4	30
Control 7	49	15	3.06	7	2.42	27
Control 8	40	12	4.08	8	2.62	20
Control 9	32	6	2	11	2.90	15
Control 10	38	9	1.88	8	2.62	21
Control 11	53	4	1.25	5	2.80	44
Control 12	46	9	3.88	3	3.66	34
Control 13	33	6	2.83	4	2	23
Control 14	50	8	2.37	5	2.8	37
Control 15	53	8	3	4	3.25	41
Control 16	50	11	2.81	12	2.25	27
Control 17	53	3	1.33	4	3.75	46
Control 18	33	9	2.55	5	1.60	19
Control 19	42	10	2.40	5	1.40	27
Control 20	47	8	2.62	6	4	33
Totals	880	172	2.79	132	2.68	576

Note. #Sub = how many subjects chose that item as a target item; # Increase = how

many subjects increased their plausibility estimate; # Decrease = how many subjects

decreased their plausibility estimate; # Same = how many subjects showed no change in

their plausibility estimate. Ave. Pts. = the average amount of change on each item.

The analysis of low plausibility items and control items reflect not only research findings from previous research but also support the hypothesis of the present study. It is

expected that control items will see little change and low plausibility items will be more susceptible to change. However, this study included high plausibility items and the results for these items is more difficult to explain.

The high plausibility item responses were very similar to the low plausibility responses in that they decreased from pre-test to post-test on 33% of the responses, increased on 28% of the responses, and stayed the same on 38% of the responses. These percentages can be compared to the low plausibility responses, at 38%, 25%, and 36%, respectively. The average increase for these items was 1.77 points, and the average decrease was 3.9 points. This wide difference between the amount of increase and the amount of decrease per item can probably be explained by a ceiling effect. The high plausibility items were chosen because they were rated at a 5 or higher, and on the eight point scale that only allows upward movement of a couple of points. The reason for the decrease may be an unforeseen result of the manipulation.

Table 4

High Plausibility Item Responses

Item	# Sub	# Increase	Ave. Pts.	# Decr.	Ave.Pts.	# Same
High Pl. 1	10	3	1	4	3.25	3
High Pl. 2	3	1	.5	1	6	1
High Pl. 3	4	-	-	3	5.33	1
High Pl. 4	8	2	2	2	3	4
High Pl. 5	8	4	1.5	1	5	3
High Pl. 6	3	2	1	-	-	1
High Pl. 7	3	1	2	1	1	1
High Pl. 8	14	6	1.5	1	3	7
High Pl. 9	12	2	1.5	3	4	7
High Pl. 10	2	1	5	-	-	1
High Pl. 11	-	-	-	-	-	-
High Pl. 12	8	4	1	1	5	3
High Pl. 13	9	1	1	3	3.33	5
High Pl. 14	-	-	-	-	-	-
High Pl. 15	2	1	1	1	5	-
High Pl. 16	1	-	-	1	5	-
High Pl. 17	2	-	-	1	5	1
High Pl. 18	8	5	1.6	2	3	1
High Pl. 19	10	3	1	4	3.75	3
High Pl. 20	3	1	5	2	2	-
Totals	110	37	1.77	31	3.9	42

Note. #Sub = how many subjects chose that item as a target item; # Increase = how

many subjects increased their plausibility estimate; # Decrease = how many subjects

decreased their plausibility estimate; # Same = how many subjects showed no change in

their plausibility estimate. Ave. Pts. = the average amount of change on each item.

The means for related items were all very similar. Low plausibility related items yielded a mean of 4.6, high plausibility related items had a mean of 4.9, and control plausibility related items had a mean of 4.7. These results indicate that the hypothesis concerning related items, primarily the supposition that related item plausibility ratings may also go up as a result of the plausibility scenario is not supported. The hypothesized result would have shown that the post-test related item means were reflecting the same

pattern as the post-test means for all three types of items. The events may not be closely enough related to be highly likely to only occur in conjunction with the original event, or the effect does not spread to related items.

CHAPTER 4

DISCUSSION

Memory serves an important function in defining the individual. A large body of literature supports the fact that memory is not completely stable over time and can be modified as a result of a number of types of events. Most of the time, small modifications go unnoticed. In the case of memory creation, however, modification can have serious ramifications for individuals and their families. The recent surge in literature addressing this memory creation strives to understand how and under what conditions it can occur. A preliminary step to this understanding is the memory creation model, in which Hyman suggests that three steps seems to be present in most cases of memory creation to occur. Plausibility is the first of these three steps.

The existing plausibility literature examines different conditions or characteristics that may affect plausibility judgments. Though only a small number of studies addressing this question have been done, there does seem to be evidence to support the theory that imagining an event can inflate plausibility ratings. The present study found that imagination may not be the only thing which causes plausibility judgments to go up.

The major result of this study is that describing an unlikely autobiographical event changes the plausibility rating of that event. This change in plausibility ratings is likely to be in the form of movement from less plausible to more plausible, though slight movement in the other direction is found. These findings are consistent with those of

previous research. Other studies using the Life Events Inventory indicate that imagining an event increases the plausibility of that event (Garry, et al, 1996; Heaps & Nash, 1999; Manning & Loftus, 2000), or that suggestion from a well-known therapist can increase plausibility of events (Mazzoni, et al, 1999). There is high similarity of results between these previous studies and the present study.

Table 6

Comparison of Present Study to Previous Research

	Present Study	Garry, et al (1996)	Heaps & Nash, (1999)	Manning & Loftus, (2000)
Positive Change in Target Items	38% of subjects	34% of subjects	22.6% of subjects	34% of subjects
Positive Change in Non-Target Items	19% of subjects	25% of subjects	14.5% of subjects	28% of subjects

Earlier studies and the present study share a similar methodology as well as similar results. The basic method involves a pre-test administration of the Life Events Inventory, followed by some type of manipulation, and ending with another administration of the LEI. The procedure typically differs in the type of manipulation. The first study to use the LEI (Garry, et al, 1996) presented participants with instructions to imagine the events and then described the setting and salient aspects of the event to be imagined. Both Heaps & Nash, (1999) and Manning and Loftus, (2000) used this type of manipulation. The present study changed this manipulation to one in which participants were asked to describe the event and they were not given any other information about the course of the event to be described. The concern regarding the imagination instructions is twofold; first, that the additional information given may direct participant away from being able to

interpret the event in the context of their own autobiographical experiences, and second, that the additional information may not be necessary to induce the increase in plausibility ratings. The present study cannot speak to the first concern, because the change in ratings is so similar across all four studies. However, that similarity does indicate that an increase in the likelihood or plausibility of unlikely autobiographical events can take place without strong suggestion to imagine an event that is partially already created.

Another difference between this study and earlier studies is that the target items were chosen as a result of the participants score, that is, low plausibility items began that way, and earlier studies used predetermined target items which means that at least part of the sample had high plausibility ratings for those events. The slightly higher number of participants in the present study who increased their plausibility ratings may be as a result of this manipulation. All the participants began the plausibility scenario with two low rated items, therefore, participants were free to move up the scale as a reflection of the change in plausibility judgment, but restricted in their ability to show negative change due to a floor effect on those items.

The last major difference between the present study and previous work is the addition of novel items that were related to the original items. The hypothesis regarding these items was that the plausibility scenario might affect events closely related to the target events. That result was not found in the present study, and may be due to a flaw in the design. Either the plausibility judgments are not inclined to change for related events, or the related events are too distinct from the original events.

Garry, et al (1996) has suggested that one of the possible explanations for the increase in plausibility ratings may be familiarity to the events. The present study attempted to compensate for familiarity issues by setting a one-week period between pre-test and

post-test and by revising the post-test version of the LEI so that it was different from the pre-test. However, the results of the present study may provide the best evidence contradicting effects of familiarity. Target items show an increase in plausibility and a decrease in plausibility. The increase is more dramatic, but the decrease is present. In fact, means on all types of items showed a small decrease. The question then becomes one of how events become less familiar, and in response to that question another explanation might warrant examination.

Small changes in plausibility ratings could result from problems in the scale itself because the difference in likelihood between two and three or six and seven may be difficult for participants to define. The question would be whether or not participants view a score of six as being very close in plausibility to seven or whether those two points on the scale are seen as being distinct. Therefore, average increases and decreases in plausibility ratings of one or two points might be due to an inability to distinguish between two very close points on the scale. This is a problem which requires further research, however, in the present study the control item responses remain the same for 65% of the sample. It would appear that for some items, difficulty in distinguishing close points on the scale is not a concern. Additionally, the mean positive change for low plausibility items in this study was almost four points, which moves items from the low plausibility end of the scale to the high plausibility end. This amount of change would probably be less difficult for participants to distinguish because the fundamental meaning of the rating changes. Though scaling problems may be a factor in some of the results, they certainly do not explain the high levels of change seen on low plausibility items.

The preliminary nature of this study also needs to be considered. Normative and analytic data has not yet been collected on the Life Events Inventory itself and there may

be other factors or variables not yet understood which affect responses to the ratings. A possible weakness of this study is that plausibility ratings may change as a result of some mechanism other than a change in the perceived plausibility of these events. For instance, if a number of the responses are triggering memory for real events which for some reason cannot be completely reclaimed, the results would not be indicative of a plausibility judgment, but of memory recall.

Research is needed to establish the reliability and validity of this scale. Understanding how normal the events are for a large sample could also assist in interpreting results from the scale, perhaps even lead to modifications which would make it more useful in this type of research. Factor analysis could also be performed and might indicate whether any of the events are connected to each other in ways that are not yet understood.

The relative scarcity of research can be addressed by further studies, and the inherent weaknesses of this study can be controlled through modifications to the design, however, this type of work is important for clarifying the processes involved in memory creation. Regardless of the possible causes, individuals who indicate that something probably did not happen to them can be induced through very simple procedures to claim that the event might have happened to them. Repeated instances of this type of process could be implicated in cases of memory creation.

APPENDIX A

ORIGINAL LIFE EVENTS INVENTORY

Life Events Inventory

Below are some events that may or may not have happened to you before you were 10 years old. For each event indicate how certain you are that the event (or a very similar event) did or did not happen to you by circling one of the numbers on the right. Mark 1 only if you are completely confident that the event did not happen to you. And, mark 8 only if you are completely confident that the event did happen.

Before you were about 10 years old you.....

	Definitely did not happen				Definitely did happen			
1. got sick while at school.....	1	2	3	4	5	6	7	8
2. shook hands with someone famous.....	1	2	3	4	5	6	7	8
3. ran away from home.....	1	2	3	4	5	6	7	8
4. cried when you had to go to the dentist.....	1	2	3	4	5	6	7	8
5. adopted a lost animal.....	1	2	3	4	5	6	7	8
6. kissed a boy or girl at school.....	1	2	3	4	5	6	7	8
7. saw a solar eclipse.....	1	2	3	4	5	6	7	8
8. saw an R-rated movie.....	1	2	3	4	5	6	7	8
9. were lost in a public place for more than an hour.....	1	2	3	4	5	6	7	8
10. found \$10 in a parking lot.....	1	2	3	4	5	6	7	8
11. got in trouble for calling 911.....	1	2	3	4	5	6	7	8
12. felt an earthquake.....	1	2	3	4	5	6	7	8
13. had to go to the emergency room late at night.....	1	2	3	4	5	6	7	8
14. had someone pull you from the water.....	1	2	3	4	5	6	7	8
15. had your house robbed.....	1	2	3	4	5	6	7	8
16. had to have someone help you out of a tree.....	1	2	3	4	5	6	7	8

17. broke a window with your hand.....1 2 3 4 5 6 7 8
18. cheated on a test.....1 2 3 4 5 6 7 8
19. won a prize at a carnival game.....1 2 3 4 5 6 7 8
20. gave someone a haircut.....1 2 3 4 5 6 7 8

APPENDIX B

EXTENDED LIFE EVENTS INVENTORY

[Note: This extended version of the LEI is presented in order to show the original items (O) with the related items (R) following. For use with participants, the items were listed randomly.]

Life Events Inventory

Below are some events that may or may not have happened to you before you were 10 years old. For each event indicate how certain you are that the event (or a very similar event) did or did not happen to you by circling one of the numbers on the right. Mark 1 only if you are completely confident that the event did not happen to you. And, mark 8 only if you are completely confident that the event did happen.

Before you were about 10 years old you.....

- | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--|---|---|---|---|---|---|---|---|
| 1. got sick at school (O)..... | | | | | | | | |
| 2. were sent to the nurse's office (R)..... | | | | | | | | |
| 3. shook hands with someone famous (O)..... | | | | | | | | |
| 4. wrote to a movie star (R)..... | | | | | | | | |
| 5. ran away from home (O)..... | | | | | | | | |
| 6. got yelled at for bad behavior (R)..... | | | | | | | | |
| 7. cried when you had to go to the dentist (O)..... | | | | | | | | |
| 8. felt pain when the dentist filled a tooth (R)..... | | | | | | | | |
| 9. adopted a lost animal (O)..... | | | | | | | | |
| 10. bought a leash and collar for a dog (R)..... | | | | | | | | |
| 11. kissed a boy or girl at school (O)..... | | | | | | | | |
| 12. held hands with your first girl/boyfriend (R)..... | | | | | | | | |
| 13. saw a solar eclipse (O)..... | | | | | | | | |
| 14. were told not to look directly at the sun (R)..... | | | | | | | | |

15. saw an R-rated movie (O).....1 2 3 4 5 6 7 8
16. lied to your parents about what movie you'd seen (R).....1 2 3 4 5 6 7 8
17. were lost in a public place for more than an hour (O).....1 2 3 4 5 6 7 8
18. had someone page your parents over an intercom (R).....1 2 3 4 5 6 7 8
19. found \$10 in a parking lot (O).....1 2 3 4 5 6 7 8
20. turned found money into the authorities (R).....1 2 3 4 5 6 7 8
21. got in trouble for calling 911 (O).....1 2 3 4 5 6 7 8
22. had to apologize to the target of a prank (R).....1 2 3 4 5 6 7 8
23. felt an earthquake (O).....1 2 3 4 5 6 7 8
24. were jostled out of sleep by movement (R).....1 2 3 4 5 6 7 8
25. had to go to the emergency room late at night (O).....1 2 3 4 5 6 7 8
26. woke up feeling very sick (R).....1 2 3 4 5 6 7 8
27. had someone pull you from the water (O).....1 2 3 4 5 6 7 8
28. had trouble learning how to swim (R).....1 2 3 4 5 6 7 8
29. had your house robbed (O).....1 2 3 4 5 6 7 8
30. had something important to you taken away (R).....1 2 3 4 5 6 7 8
31. had to have someone help you out of a tree (O).....1 2 3 4 5 6 7 8
32. got yelled at for getting stuck in a tree (R).....1 2 3 4 5 6 7 8
33. broke a window with your hand (O).....1 2 3 4 5 6 7 8
34. got stitches (R).....1 2 3 4 5 6 7 8
35. cheated on a test (O).....1 2 3 4 5 6 7 8
36. got a good grade you didn't deserve (R).....1 2 3 4 5 6 7 8
37. won a prize at a carnival game (O).....1 2 3 4 5 6 7 8
38. displayed a prize you won in your room (R).....1 2 3 4 5 6 7 8
39. gave someone a haircut (O).....1 2 3 4 5 6 7 8
40. got a lecture about using scissors (R).....1 2 3 4 5 6 7 8

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