

ATTRIBUTIONAL BIASES AND THE INABILITY TO IGNORE RETRACTED INFORMATION

By: Seneca A. Bivens

The purpose of the study was to explore factors that result in one type of distortion in memory. In particular, previous research has shown that people have a difficult time disregarding causal information that has later been retracted (e.g., Johnson & Seifert, 1994). The present investigation was designed to explore whether or not the nature of the experienced event (whether it is personally relevant to a person or not) influences this tendency. Participants were presented with stories about an airplane crash that was either personally relevant to participants (i.e., the plane departed from Milwaukee airport) or not personally relevant (i.e., the plane departed from Paris airport). Participants were given an initial cause for the airplane crash (engine malfunction), that was subsequently discredited in one of two ways. In the Negation Only condition, participants simply learned that the original cause was inaccurate. By contrast, in the Alternative condition, participants were also provided an alternative explanation for why the event occurred. Finally, participants were tested to see how much of their understanding of the events was influenced by the initial causal explanation. Results indicated that participants continued to rely on the initial causal explanation whether they were given a retraction or a retraction with an alternative explanation, which further supported previous research on the continued influence effect. Contrary to expectations, there was no significant effect of personal relevance on the number of inferences made. However, when participants were given a negation only, they were numerically more likely to make inferences based on the original causal explanation when the story was personally relevant. These results are discussed in the context of previous research on the continued influence effect.

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INFORMATION

by

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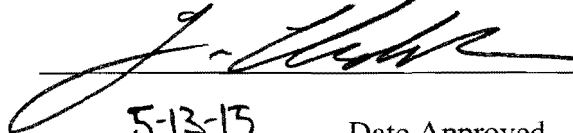
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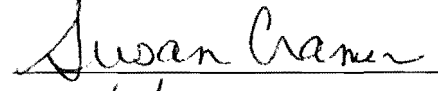
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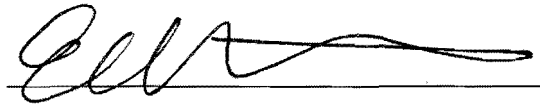
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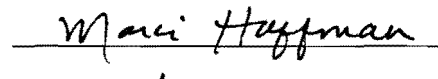
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Attributional Biases and the Inability to Ignore Retracted Information

On August 11, 1939, one of the most seen and recognized American classics was released for testing, *The Wizard of Oz* (Fleming, 1939). The movie depicts a girl, Dorothy, whose house gets uplifted by a tornado. In the events that follow, she is knocked unconscious by flying debris. When Dorothy awakens, she finds she is now in a magical world called Oz, where she embarks on a journey to find the Wizard of Oz who will help her get home. On her journey, Dorothy meets a scarecrow, a tin man and a lion, who help her along the way. During the scene when Dorothy meets the Tin Man, a shadow moves across the background. Speculation began suggesting that the shadow moving was an actor who hung himself due to unrequited love. MGM (Metro-Goldwyn-Mayer) studio explained the shadow as an exotic bird wandering around in the background. They went on to further explain that the actor in question was not on set that day. However, to this day, a significant number of people still continue to believe that an actor killed himself, even though the original explanation was discredited (see, [kx-vids.net](#)). This example illustrates that despite overwhelming evidence to the contrary, people can have difficulty ignoring causal explanations (e.g., the shadow was *caused* by an actor in the background) that have been discredited. The current investigation seeks to explore one specific situation in which it may be particularly difficult to disregard discredited information: one in which the event is personally relevant or important to the individual.

Continued Influence Effect

Previous research has established that people have difficulty ignoring statements that have been subsequently retracted, a finding referred to as the *continued influence effect*. This has been demonstrated in studies that use an experimental method in which participants read a story in which an original cause is given for an event (e.g., volatile chemicals *caused* a fire) (Johnson & Seifert, 1994). Later in the story, that previously provided cause is discredited as inaccurate. The original cause can be discredited in one of two ways: by negation only or by using negation with an alternative explanation. *Negation only* is when the original statement is discredited without providing any additional information about a possible alternative cause (e.g., volatile chemicals did not cause a fire). By contrast, *negation with an alternative explanation* refers to situations in which the original statement is discredited but, in addition, a viable alternative explanation is provided (e.g., volatile chemicals did not cause a fire, but a faulty electrical outlet did).

Of primary interest in such a paradigm is the extent to which participants continue to believe the original causal explanation and thus use it as a basis for understanding the overall event. Assessing this belief is accomplished by asking participants questions which force them to make logical inferences based on their understanding of the events they had read (e.g., “Why did the fire spread so quickly?”). If the participant continues to believe the original misinformation, they are more likely to provide answers that relate to the presence of volatile chemicals. In general, results suggest that negation statements are

not sufficient to eliminate the reliance on the discredited information. However, when alternative explanations are provided, people are able to disregard the discredited information (Johnson & Seifert, 1994).

The aforementioned finding fits with existing experimental research suggesting that people are driven to seek out causal explanations for events (e.g., Weiner, 1985). Thus, in the context of the continued influence effect paradigm, when only a negation is given, it leaves participants seeking a causal explanation. Consequently, they continue to rely on the original cause even though it has been discredited. Seeking out a causal explanation, regardless of its accuracy, allows a person to construct a complete mental representation of the events that were described. This mental representation has been referred to as a *situation model* (Zwaan, Langston & Graesser, 1995; Zwaan & Radvansky, 1998) and it allows the reader to make inferences and causal links between the individual aspects of the event they experienced (Graesser, Singer & Trabasso, 1994).

A real world example helps to illustrate this effect. In early 2003, the United States went to war with Iraq on the belief that Iraq was hiding weapons of mass destruction that were intended to be used in an attack against the U.S. In late 2003, the explanation for the invasion was discredited by the U.S. Government, stating there were no weapons of mass destruction found in Iraq (Baldwin, 2003). This simple negation left Americans without a complete situation model. When it seemed there was a reason to go to war with Iraq, many Americans backed their leaders in hopes of keeping the country safe, but when the original reason disappeared, Americans were left seeking a true cause.

In order to make sense of such events, many fell back on the original cause, weapons of mass destruction, which made their situation model complete regardless of its accuracy (Lewis, 2014).

Attributional Processes

In the continued influence effect paradigm, people are required to make an attribution about why a particular outcome took place (e.g., why the fire started). In doing so, they establish a complete situation model for the event they have experienced. There is a long line of research in the domain of social psychology that has explored how people make attributions as to why various outcomes occur (e.g., Heider, 1944). People are especially prone to make attributions that are in accord with their broader beliefs about the world. In particular, they are likely to make attributions based on the extent to which they believe that good things happen to good people and bad things happen to bad people (i.e., belief in the just world; Lerner & Simmons, 1996).

The extent to which a person's belief in the just world affects their understanding of an experienced event is illustrated by a study conducted by Lerner and Matthews (1967). In this study two participants met in a room and were told that they would be asked to draw a slip of paper out of a container that would state which condition (negative reinforcement condition or positive reinforcement condition) they would be in. The participant who drew first believed that in some way they were responsible for the other participant's fate by designating each participant the positive or negative condition.

Next, they were asked to complete questionnaires that would judge the attractiveness of the participant they had first met. When participants believed they were responsible for another's fate (i.e., drew first, other gets undesirable condition), they tried to find fault in the other person and, as a result, rated them less attractive. Specifically, they attributed negative characteristics to the person in order to justify why they deserved the negative condition (Lerner & Miller, 1978). However, when the other person was responsible for their own suffering (i.e., drew first, gets undesirable condition), participants identified with them; understanding that they could share a similar fate if the situation was reversed. This understanding allowed participants to personally relate to the other person and, in turn, rate them as more attractive.

The aforementioned study is informative in terms of how people make attributions about others. However, people also make attributions about why things happen to themselves. Similar to attributions made about other people, personal attributions can also be made in accord with their belief in the just world - a concept known as the *self-serving attribution bias* (Miller & Ross, 1975). To demonstrate this bias, Miller (1976) asked participants to complete a scale that rated their social perceptiveness. Participants were either told that the assessment measure was valid and a high predictor of positive characteristics or invalid and had not yet been established as a predictor of any characteristics. Next, participants were given false scores that were in no way related to their initial responses and a final questionnaire that assessed their reaction to the social-perceptiveness scale. Results indicated that when participants were told the

scale was a valid measure and were given a failing score, they were more likely to attribute their failure to external factors such as luck. These results demonstrated that people typically seek causal attributions that enable them to remain in control of their lives while continuing to believe the world is just by only producing positive outcomes.

Attributions Based on Memory

As we have seen, people make attributions about the reasons for the events they experience, and this process can be influenced by a variety of factors. However, research also suggests that attributional processes can play a key role in human memory. These types of attributions do not involve determining the causes for experienced events. Rather, they occur when people are asked to make judgments about where information came from in memory. In general, the ability of a person to determine where a piece of information in memory came from is referred to as *source monitoring* (Johnson, Hashtroudi, & Lindsay, 1993). This can be most easily understood in terms of “reality monitoring” – a specific type of source monitoring in which people are required to discriminate between events that actually occurred, as opposed to those that they only imagined or were suggested to them (e.g., Johnson & Raye, 1981). There are no “memory tags” attached to a memory that directly indicate where that information came from. Rather, source information has to be *inferred* based on the characteristics of the memory itself. Specifically, memories for experienced events tend to be richer in contextual, perceptual, and temporal details than memories for information that has not

been experienced (Johnson, 1988). When recalling a specific piece of information, people make an attribution about the source of that memory based on its characteristics.

Research suggests that source monitoring can be biased by the nature of the information and the goals of the individual, as people are more likely to accurately remember the source of information if it follows suit with their desires. For example, Gordon, Franklin and Beck (2005) tested participants' ability to monitor the source of information that came from either a reliable or unreliable source. In particular, they were interested in the extent to which participants attributed "desirable" predictions to a reliable psychic (Anna) as opposed to an unreliable psychic (Candy). Participants were required to read one of two opening statements that were either desirable (e.g., the Sienna Fern is a plant whose leaves can be used to ease allergy symptoms) or undesirable (e.g., the Sienna Fern is a weed to which most people are allergic). Then the participants read a prediction (e.g., this plant, which at present is relatively rare, will begin growing in higher numbers in urban areas). Finally, participants were asked to state which psychic had made the prediction. Results indicated that people were more likely to attribute positive predictions to the more reliable source whereas negative predictions were more likely to be attributed to the unreliable source.

Similarly, Henkel and Mather (2007) explored people's ability to remember information associated with either a chosen or un-chosen option. Participants were presented with a scenario in which they were asked to make a choice between two different vehicles (e.g., red or black car). Each vehicle had a number of positive

characteristics (e.g., good handling on turns) as well as a number of negative characteristics (e.g., no warranty). After a brief delay, participants were asked to indicate which characteristics belonged to their chosen option, and which belonged to the option that they had declined. Results indicated that participants were more likely to attribute positive characteristics to their chosen option. Thus, some people who originally chose the red car would state that it had comfortable seats and a sun roof. Overall, this study further demonstrates the importance of a person's motivation in reconstructing past memories.

The previous two studies demonstrated that memory can be influenced by the extent to which people are personally invested in the events. The notion of personal investment is one that varies across situations and experiences, and may be expressed in a variety of different ways. Maehr and Braskamp (1986) stated that personal investment can be expressed by the choices a person makes, the persistence, continuing motivation and intensity a person shows when performing an activity and finally, the actual performance of a task. Furthermore, these behavioral expressions can be influenced by internal (e.g., thoughts and emotions) and external (e.g., nature of the task, social norms, payoffs, etc.) factors. In the Henkel and Mather (2007) study, participants were more motivated to pick positive attributes for the car of their choice and less desirable attributes for the opposing car – suggesting that they had a continued investment in the initial decision they made. In the study conducted by Gordon, Franklin and Beck (2005), participants were influenced by internal factors (i.e., desirable thoughts and positive

emotions). Specifically, participants showed that it is more desirable to receive a positive prediction from a reliable source versus an unreliable one. Both studies demonstrated that a person's investment can impact their memory and the outcome of the tasks they are involved in.

Attributions and Continued Influence

More recent research has begun to explore how "investment" may influence people's ability to disregard discredited causal information. For example, Lewandowsky, Stritzke, Oberauer and Morales (2005) explored people's ability to disregard retracted information about the war in Iraq. Specifically, they examined the ability of participants from various countries that either supported the war (Australia and the United States) or those from a country that was openly against the war (Germany) to ignore information that was subsequently retracted. Participants were presented with statements that were true about the war (i.e., true), were presented as true and then retracted (i.e., false retracted) and statements that were made up by the researcher (i.e., fictional). Participants were first asked to state whether the statement was true or false. In addition, they were asked to indicate how certain they were the information had been retracted. Results indicated that it was most difficult for American participants to dismiss discredited information, where it was easiest for the German participants – a finding moderated by how suspicious participants from those countries were about the motivation of the war. Presumably, American participants had a greater personal investment in the cause of the

war being just, which reduced their suspicion of the true nature of the war – thus increasing their susceptibility to the continued influence effect.

However, the way in which personal investment (in this case ‘suspicion’) was assessed in this study is potentially problematic. Participants’ suspicion for the motivations for the war was not experimentally manipulated – rather it was derived from other measures that were collected. Specifically, suspicion was derived by reverse coding participants’ agreement that the war was fought to destroy weapons of mass destruction (i.e., a higher score meant more suspicion). Without directly manipulating “suspicion,” the possibility exists that other confounding variables played a role in participants’ ability to dismiss discredited information. For example, the amount of knowledge a person gained about the war could have changed their understanding of the events. If the participants from Germany spent more time reading, watching news reports and having conversations with others about the war in comparison to the American and Australian participants; they would be able to disregard discredited information at a higher rate. Thus, to date, no study has experimentally manipulated the impact of personal relevance on the continued influence effect.

Proposed Research

The current study used the continued influence effect paradigm (e.g., Johnson & Seifert, 1994) to investigate how the relevance of information to an individual influences their ability to disregard retracted causal information. Participants were presented stories

about an airplane crash. In the Personally Relevant (PR) condition, the story was about an airplane crash in which the plane departs from the Milwaukee airport, whereas in the Not Relevant (NR) condition the plane departs from a city in a different country (i.e., Paris). Presumably, participants from a mid-sized Midwestern university will be more invested in the outcome of the characters in the story that originates from a nearby U.S. city, as opposed to a foreign one. Participants were given an initial cause for the airplane crash (i.e., an engine malfunction). However, later in the story, this information was discredited by either a statement of negation or a negation/alternative (i.e., crack in the wing). Participants were later tested to see how much of their understanding of the events was influenced by the initial causal explanation.

There were two primary hypotheses for the current investigation. First, it was predicted that, compared to the NR condition, participants in the PR condition would make more false inferences – but only when they are given a statement of negation alone (Hypothesis 1) (see Table 1). That is, participants in the PR condition would continue to believe the misinformation to a greater extent because it provides a causal explanation (see for example, Chrobak & Zaragoza, 2013) for something that is personally relevant to them. Specifically, when participants identify with the victims in the story lines, they would be more likely to seek an external causal attribution to explain why such a tragedy happened. However, a different prediction was made when participants received an alternative explanation for the original cause. It was predicted that, in comparison to the NR condition, participants in the PR condition would make fewer inferences when they

are given a negation followed by an alternative causal explanation (Hypothesis 2) (see Table 1). That is, participants in the PR condition would believe the alternative explanation to a greater extent because it provided a causal explanation for something that is personally relevant to them. Again, when participants identify with the victims in the story lines, they were more likely to seek an external causal attribution to explain why such a tragedy happened, in turn, relying on the alternative explanation.

It is important to note, in the current study there is also a third condition that participants could have been placed in. Specifically, the third condition was the No Retraction condition in which participants received a story line that did not have a retraction or an alternative explanation for the plane crash. The No Retraction condition was used as a base line to assess whether or not the presence of a retraction reduced the extent to which participants made reference to the original causal information (see Table 1). In addition, it is hypothesized that participants in the No Retraction condition would make more references to the original causal information when the story was personally relevant than when it was not (Hypothesis 3). It is believed that participants in the PR condition will find more relevance in the story lines and, in turn, pay closer attention to the cause of the plane crash leading to greater inferences to the original causal explanation.

Finally, two additional hypotheses are included based on participants' belief in the just world. First, it was predicted that, compared to the NR condition, participants in the PR condition would make more inferences to the original information, but only when

they are given a statement of negation and had a high belief in the just world (e.g., a score of 41 or greater out of 55; which would place participants' scores in the 75th percentile) (Hypothesis 4). Second, it was predicted that, in comparison to the NR condition, participants in the PR condition would make fewer inferences when they are given a negation followed by an alternative causal explanation and had a high belief in the just world (Hypothesis 5).

Table 1. *Hypothetical number of inferences to the original causal explanation as a function of condition*

	No Retraction	Negation	Alternative
<i>Relevance Condition</i>	<i>M</i>	<i>M</i>	<i>M</i>
<i>Personally relevant</i>	5.9	0.8	0.2
<i>Not personally relevant</i>	5.7	0.5	0.3

Note. The numbers presented are hypothetical predictions that show the direction of both hypotheses. They are also in line with past research based on the continued influence effect (Ecker, Lewandowsky & Apai, 2011).

Methods

Participants

One hundred and three general psychology students from a mid-sized Midwestern college were recruited using the SONA system - an online participant management system. Participants received course credit based on participation, and were tested in groups of up to ten. There were 18 participants in the PR Alternative condition, 17 participants in the PR No Retraction condition and 16 participants in the PR Negation condition. There were 18 participants in the NR Alternative condition, 19 participants in the NR No Retraction condition and 15 participants in the NR Negation condition.

Design

A 2 (relevance: personally relevant vs. not personally relevant) x 3 (retraction type: no retraction vs. negation vs. alternative) between-participants design was employed. Personal relevance was defined as a person's ability to identify with another individual and understand that they could share a similar fate. Personal relevance was manipulated by varying the location (Oshkosh, Wisconsin or Paris, France) from which the students in the news story originate and the reporting source (Advanced Titan newspaper or The Connexion newspaper). The Advanced Titan is the newspaper in circulation at the university where the data was collected. The Connexion is a real newspaper distributed in France. The extent to which participants felt personally

connected to the stories was assessed by a questionnaire administered at the end of the experiment.

Retraction type was manipulated by changing the way in which the initial information was retracted (i.e., no retraction, negation or negation with an alternative). Specifically, all participants were given an initial cause of an engine malfunction being the cause of a plane crash. If a participant was in the negation condition, the initial causal explanation was retracted (e.g., the plane crash was not due to an engine malfunction). If a participant was in the alternative condition, the initial casual explanation was retracted and the participant was given an alternative causal explanation (e.g., the plane crash was not due to an engine malfunction but a crack in the wing). Finally, if a participant was in the no retraction condition, the initial causal explanation was not retracted in any way.

Procedure

Upon arrival to the testing room, participants were seated at a testing station with a folder of experiment materials placed in front of them. Folders included a consent form, introduction, and a randomly assigned story line from one of six conditions. To ensure the researcher was blind to the randomly assigned story line, folders were made by three research assistants who did not collect any data. Participants were then asked to open their folders, remove the first two sheets (consent form, see Appendix A), read it to themselves and sign it. Once any questions were addressed, the researcher collected the consent forms.

Participants were then asked to remove the next form in their folder, the introduction to the study (see Appendix B and C). The introduction form gave a more thorough overview of the study. Specifically, participants were instructed that they would have to read a series of newspaper excerpts and that their task was to actively imagine the events being described. In addition, they were told that they would subsequently be asked a series of questions about these events.

Participants then read one of six randomly assigned sets of story materials (see Appendix D, E, F, G, H, and I). Participants were allowed to read at their own pace but were not allowed to go back to previously read passages. There were between 16 and 18 excerpts to the story and each excerpt was on a separate sheet of paper to ensure participants did not return to previous excerpts while reading. Once the story had been read fully, participants completed two filler tasks which took 35 minutes total.

First, a word search was used containing 27 synonyms for the word “imagine” randomly placed throughout the grid (see Appendix J). Participants were told that this task would be used to assess their imagination. Next, participants were asked to watch a movie, *Planet Earth: Deserts* (Fothergill, 2006). After watching the video, they were given a questionnaire that would help assess the effectiveness of different types of teaching tools (see Appendix K). Participants were told that they were performing this task to help with another study.

After the filler tasks, participants were given a questionnaire which asked questions about the plane crash story (see Appendix L). The purpose of the questionnaire

was to assess the extent to which they believed the original causal explanation. The critical questions were designed in such a way that they did not directly ask participants about the cause of the plane crash. Instead, they sought information which would require participants to provide information that could be derived from a logical assessment of the information provided in the story. Consider, for example, the following question: “How could this crash have been avoided?” If a participant provided an answer such as, “By performing a better inspection of the engine,” this would indicate that the participant still believed the initial causal explanation (i.e., engine malfunction) to be true. The number of inference errors a participant made about the misinformation on the questionnaire was the dependent variable and was used to analyze participants’ belief of the initial causal explanation given in each story line.

This initial questionnaire also included a number of questions designed to assess the extent to which the information in the passages were accurately encoded (e.g., Where was the plane headed?). Next, participants were given a questionnaire that was used as a manipulation check to assess the plausibility (e.g., “The events described were believable”) and personal relevance of the story lines with statements (e.g., “I identified with the students in the story”) (see Appendix N). The questionnaire also assessed participants’ ability to imagine the story lines (e.g. “I could picture the events in my mind”) and if they would like further information about the event described (i.e., closure) (e.g., “I want to learn more about the events described”). All items on the questionnaire used as a manipulation check were assessed using a Likert scale (1 = strongly disagree to

5 = strongly agree) (see Appendix N). A final questionnaire was used to assess their belief in the just world (Rubin & Peplau, 1975) (see Appendix O). The questionnaire was a modified version of the Rubin and Peplau (1975) Just World Scale. Specifically, all questions on the Just World Scale that were reverse coded were eliminated for ease of scoring. When all questionnaires were completed, participants were debriefed (see Appendix P) and allowed to leave.

Coding

Each participant answered six inference questions based on the story lines that they read. All written responses were rated by two independent judges in terms of the number of errors made (i.e., references to the original causal information) by condition. For example, when a participant was given the question, “Does any aspect of the incident require further investigation?” and gave the response “Yes, why the engine actually malfunctioned while in the air” received one point for indicating further belief in the initial causal explanation. In contrast, a statement such as “What the actual cause was” did not receive a point because it did not reference the original explanation (see Appendix M for the complete coding scheme). The highest possible number of errors that could be made was six (i.e., one for each of the six different inference questions). When there was a discrepancy between judges, coding was resolved by discussion.

Data Analysis

The primary analyses conducted were two 2 (relevance: personally relevant vs. not relevant) x 3 (retraction type: no retraction vs. negation only vs. negation with an alternative) factorial analysis of variance (ANOVA). The first ANOVA used the number of inferences of misinformation made as the dependent variable. Specifically, this ANOVA was used to test Hypothesis 1 (i.e., compared to the NR condition, participants in the PR condition would make more false inferences – but only when they are given a statement of negation alone) and Hypothesis 2 (i.e., compared to the NR condition, participants in the PR condition would make fewer inferences when they are given a retraction followed by an alternative causal explanation). The second ANOVA used the number of correct answers given by participants' on the fact recall questions as the dependent variable. Again, the answers given to the fact recall questions were designed to assess the extent to which information in the passages was accurately encoded. Based on the assumptions of an ANOVA, this is the best statistical method to show if there was a main effect for relevance or retraction type on the dependent variable. Also, the factorial ANOVA determined if there was an interaction between factors (relevance and retraction type). An ANOVA assumes that the samples are independent, normal and the variance of the population is equal. Also, a separate one-way ANOVA was used to test Hypothesis 3. Specifically, in the No Retraction condition participants would make more references to the original causal information when the story was personally relevant than when it was not. Finally, four separate one-way ANOVAs were used to determine if there was a

difference between the PR and NR conditions in terms of plausibility, relevance, ability to imagine and need for closure of the story lines.

The ANOVAs were followed by two separate, but specific mediations with the participants' belief in the just world score used as the mediator. The first mediation compared the number of inferences made between participants who received a negation only in the PR and NR conditions. Specifically, this mediation was used to explore Hypothesis 4 - compared to the NR condition, participants in the PR condition would make more inferences to the original information, but only when they are given a statement of negation and they had a high belief in the just world. The second analysis compared the number of inferences made between participants who received an alternative explanation in the PR and NR conditions. This mediation was used to explore Hypothesis 5 – compared to the NR condition, participants in the PR condition would make fewer inferences when they are given a negation followed by an alternative causal explanation and they had a high belief in the just world.

Results

References to Initial Misinformation

The first two-way between-groups analysis of variance was conducted to explore the impact of relevance and retraction type on the number of inferences of misinformation made by participants (i.e., dependent variable). Data from the three retraction conditions (i.e., no retraction, alternative and negation) were explored in the first ANOVA. There was a statistically significant main effect for retraction type, $F(2, 97) = 10.86, p < .001$; however, the effect size was small (partial eta squared = .18). The interaction between relevance and retraction type was not statistically significant, $F(2, 97) = 1.07, p = .35$. Post-hoc comparisons using the Tukey HSD test indicated that participants in the no retraction condition ($M = 1.31, SD = 1.37$) made significantly more references to the original causal information than participants in the negation condition ($M = .58, SD = .89, p = .01$) and participants in the alternative condition ($M = .22, SD = .49$) (see Table 2), $p < .001$. However, participants in the negation condition did not differ significantly from participants in the alternative condition, $p = .31$. The main effect for relevance, $F(1, 97) = .18, p = .68$, did not reach statistical significance. That is, participants were no more likely to make inferences based on the original causal explanation when the story was more relevant to them. Furthermore, a one-way ANOVA was conducted to explore the difference between the number of inferences participants made to the original causal explanation in the PR No Retraction condition and the NR No

Retraction condition. The results indicated no significant difference between participants in terms of the number of inferences made to the original causal explanation, $F(1, 34) = 1.05, p = 0.31$. Finally, four t-tests were run to determine if the number of inferences made in each group, individually and the retraction groups combined, were significantly different than zero. These tests were run to investigate whether a true continued influence effect was found. Individually, all means of each of the three groups were significantly larger than zero; no retraction group, $t(35) = 5.70, p < .001$, negation group, $t(30) = 3.60, p < .001$, alternative group, $t(35) = 2.80, p = .01$. Combining the retraction conditions, again, showed that the number of inferences participants made to the original causal explanation were significantly larger than zero, $t(66) = 4.40, p < .001$, thus, demonstrating that participants continued to rely on the initial causal explanation whether they were given a retraction or a retraction with an alternative explanation.

Table 2. Mean number of references made to the original causal explanation

<i>Relevance Condition</i>	No Retraction		Negation		Alternative	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Personally relevant</i>	1.06	1.39	.69	.95	.22	.43
<i>Not personally relevant</i>	1.53	1.35	.47	.83	.22	.55
<i>Overall</i>	1.31	1.37	.58	.89	.22	.49

Note. Number of participants in each cell are as follows: PR No Retraction ($N = 17$), PR Negation ($N = 16$), PR Alternative ($N = 18$), NR No Retraction ($N = 19$), NR Negation ($N = 15$), NR Alternative ($N = 18$), and maximum score was 6.

Although the interaction between relevance and retraction type was not significant, mediations were still run to explore the impact the belief in the just world had on the number of inferences that participants made. In the first mediation, the condition variable (i.e., PR No Retraction, NR No Retraction, PR Negation with an Alternative, NR Negation with an Alternative, PR Negation and NR Negation conditions) was recoded to

test for the difference between the PR Negation condition and the NR Negation condition on the dependent variable and the mediator. The coding for the conditions were as follows: 0 0 0 1 -1 (in order of coding: PR No Retraction, NR No Retraction, PR Negation with an Alternative, NR Negation with an Alternative, PR Negation and NR Negation conditions). The association between the condition variable and the dependent variable, $B = .12$, $SE = .20$, $p = .59$, and the association between the condition variable and the mediator, $B = -.18$, $SE = 1.16$, $p = .87$, were both not statistically significant, thus, not satisfying the first two steps of the mediation. The results from the first mediation showed that Hypothesis 4 was not supported. Furthermore, the belief in the just world theory was ruled out as an influence in the differences between the number of inferences participants made when given a negation only.

In the second mediation, the condition variable was recoded to test for the difference between the NR Alternative condition and the PR Alternative condition on the dependent variable and the mediator. The coding for the conditions were as follows: 1 -1 0 0 0 0 (in order of coding: PR No Retraction, NR No Retraction, PR Negation with an Alternative, NR Negation with an Alternative, PR Negation and NR Negation conditions). The association between the condition variable and the dependent variable, $B = .00$, $SE = .18$, $p = 1.00$, and the association between the condition variable and the mediator, $B = -.14$, $SE = 1.08$, $p = .90$, were both not statistically significant, thus, not satisfying the first two steps of the mediation. Based on the results, both hypotheses were not supported, specifically; there was no difference between the NR and PR conditions

when they were given a retraction followed by an alternative causal explanation or when they were given a negation only. Furthermore, based on both mediations, a person's level of belief in the just world was not a mediating factor on the dependent variable.

Fact Recall

The second 2 x 3 between-groups analysis of variance was conducted to explore the impact of relevance and retraction type on the number of correct answers given by participants on the fact recall questions. There was a statistically significant main effect for retraction type, $F(2, 97) = 4.60, p = .01$; however, the effect size was small (partial eta squared = .09). The main effect for relevance, $F(1, 97) = .86, p = .36$, did not reach statistical significance. The interaction between relevance and retraction type was not statistically significant, $F(2, 97) = .09, p = .92$. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for the no retraction condition ($M = 3.89, SD = .16$) was significantly worse than the negation condition ($M = 4.46, SD = .17$), $p = .05$, and the alternative condition ($M = 4.50, SD = .16$), $p = .02$ (see Table 3). The alternative condition did not differ significantly from the negation condition, $p > .10$.

Table 3. Correct reporting of factual information

	No Retraction		Negation		Alternative	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Relevance Condition</i>						
<i>Personally relevant</i>	3.82	.23	4.31	.24	4.44	.22
<i>Not personally relevant</i>	3.95	.22	4.60	.25	4.56	.22
<i>Overall</i>	3.89	.16	4.46	.17	4.50	.16

Note. Number of participants in each cell are as follows: PR No Retraction ($N = 17$), PR Negation ($N = 16$), PR Alternative ($N = 18$), NR No Retraction ($N = 19$), NR Negation ($N = 15$), NR Alternative ($N = 18$), and maximum score was 5.

Overall, results indicated that participants in the critical alternative and negation conditions were not significantly different in their ability to answer fact based questions. This indicates that participants in these conditions were able to sufficiently encode and recall factual details. It is unclear why participants in the no retraction condition performed worse in their ability to recall factual information. One possible explanation is that the retraction encountered by participants in the negation and alternative explanation conditions caused them to reevaluate the information that they had previously encountered in the story up to that point, resulting in better encoding.

Plausibility, Relevance, Ability to Imagine and Need for Closure

A series of one-way ANOVAs were conducted to see if there was a difference between the PR and NR conditions in terms of the plausibility of the story lines, perceived relevance of the story lines, participants' ability to imagine the story lines, and participants' need for closure of the story lines. There was no difference between conditions on any dependent measure $ps > .10$. This is important for a few reasons. First, the results demonstrated that participants in both conditions found the story lines plausible, were able to imagine the story lines and would like closure. By having no differences between participants in either condition the results found cannot be attributed to these dependent measures. Second, both conditions found the story lines equally relevant. This could explain why there were minimal differences between participants in the personally relevant and not relevant conditions when comparing the number of

inferences made based on misinformation and the number of correct answers given to fact recall questions.

Discussion

The current investigation sought to explore whether or not a person's individual investment in the events that they experienced influenced their ability to ignore previously retracted information. Overall, the results replicated previous findings involving the continued influence effect suggesting that despite the presence of a retraction, participants continued to make inferences based on the initial causal explanation. However, contrary to previous research, the presentation of an alternative explanation did not reduce reliance on the original causal information to a greater extent than the presence of a negation alone. One possible explanation for this latter finding was a lack of differentiation between participants in the retraction conditions (i.e., no retraction, negation and alternative) based on their score on the need for closure question. Specifically, all participants scored a 68% or higher on this question, which would indicate that the story lines did not provide enough information for participants to form a complete situation model (Zwaan, Langston & Graesser, 1995; Zwaan & Radvansky, 1998). With this being the case, it is assumed that although participants thought the story lines were possible (i.e., similar scores on the plausibility questions), the explanations given were not believable. This could explain why participants who were randomly assigned to the no retraction conditions had such low inference scores when they were given complete (e.g., no retraction of any type given) story lines. This could also indicate why there was a lack of differentiation between participants in the negation conditions

and the alternative conditions on a number of indicators (i.e., plausibility, number of inferences to the original causal explanation).

In addition, contrary to the primary hypotheses, participants were no more likely to make inferences in the PR condition than the NR condition – regardless of the retraction type. One possible explanation for this has to do with the personal relevance manipulation itself. Specifically, there was not a significant difference between participants in the PR and NR conditions when asked how relevant the story lines were. With the personal relevance measure only being 3 questions, one possible explanation is that these questions were not sensitive enough to detect a difference in the extent to which participants became invested in the story lines.

Another possible explanation for the lack of differential performance between the PR and NR conditions is that personal relevance was not successfully manipulated. Maehr and Braskamp (1986) suggest that a combination of internal (i.e., thoughts and emotions) and external (i.e., interest in the task and rewards or punishments) factors will determine the amount of investment a person makes. For example, if a person believes that they only need to put in minimal effort to get the maximum reward, they will invest minimal resources towards the task. However, if a person feels they would get punished if they put in minimal effort towards a task, they are more likely to invest more of their resources towards the task.

There were a number of internal and external factors associated with the current experiment that may have outweighed the personal relevance manipulation. First,

students who participated in the study were in the early stages of their college careers (i.e., freshman) and completed the study as a requirement to receive course credit. Since typical college courses require students to perform at certain levels in order to get a passing grade, they may have felt this to be a similar requirement in the study. Thus, when asked to imagine the story lines, they may have done so in a way that allowed them to picture the events regardless of the story line they received. Furthermore, because the story lines revolved around students, participants may have perceived all story lines to be personally relevant. This could explain why both conditions (i.e., personally relevant and not personally relevant) were not significantly different, but the continued influence effect was still found.

Also, recent international events that occurred around the time of data collection could have influenced the level of personal relevance participants felt towards both story lines. On March 8, 2014, a Malaysian airplane flying from Kuala Lumpur, Malaysia to Beijing went missing. At the time, many theories were circulating as to what happened to the plane. They ranged from plausible ideas, such as a missile attack or hijacking to the extreme, alien abduction or disappearance in the Bermuda Triangle (“Flight MH370 conspiracy theories,” 2014). All were explained away with a quick negation but the general public was never given a definitive alternative explanation. With this event being felt around the world, it is possible that participants in the current study were drawn to the story lines regardless of the location described, thus, creating a tie to both story lines regardless of the relevance manipulation.

It is important to note that a similar pattern was found in a recent investigation by Ecker, Lewandosky and Apai (2011) in which they sought to explore the impact of emotion on the continued influence effect. Emotionality can be viewed as similar to personal relevance in that it has been described as an influencing factor in a person's level of investment in a task (e.g., the more emotionally charged a person is the more personally invested they become, Maehr & Braskamp, 1986). In this study, the emotional nature of the story outcome was manipulated, with participants reading about a plane crash: due to bad weather and no fatalities (low emotion), due to bad weather with over 100 fatalities (medium emotion), and due to a terrorist attack with over 100 fatalities (high emotion). Although a typical continued influence effect was found (i.e., more inferences when a retraction was provided without an alternative explanation), results indicated no differences based on emotionality.

It is worth noting that, however, in the current study, there seemed to be a numerical trend in the negation only condition. Specifically, participants in the PR condition made more inferences to the initial information than those in the NR condition (see Table 2). Given the small sample size, there may not have been enough power to fully demonstrate the differences between these two conditions when a negation is given alone. Furthermore, it may be possible that when an alternative explanation is given, participants are able to make a complete mental representation of the story lines (Zwaan, Langston & Graesser, 1995; Zwaan & Radvansky, 1998) and are no longer influenced by a more subtle manipulation (i.e., personal relevance).

Finally, it was found that the belief in the just world did not influence the primary dependent variable (i.e., number of inferences made to misinformation). One possible explanation for this finding was the lack of variability between participants when comparing their scores on the belief in the just world questionnaire. A regression was conducted to explore the difference in participants' scores on the belief in the just world questionnaire. There was no statistical difference between participants in the three retraction conditions based on their scores to the belief in the just world questionnaire. Since the overall sample was homogenous in their scores, this may explain why a participant's belief in the just world may not have influenced their dependency on the misinformation.

In conclusion, few studies to date have investigated the mechanisms that contribute to the continued influence effect. The current study looked at the influence a person's investment may have on their ability to discredit misinformation. Although not significant, there was a numeric trend which suggested that personal relevance may increase the continued influence effect. However, this was only true when participants were provided with a negation, and not an alternative explanation of the original causal information. Future research needs to be conducted in order to fully understand how a person's motivations, beliefs and desires influence their ability to ignore previously retracted information. Finally, it may be beneficial to explore the internal and external factors that influence a person's level of investment in regards to their ability to ignore previously retracted information.

APPENDIX A

UWO Department of Psychology Consent Form

UWO Department of Psychology Consent Form

The Department of Psychology supports the practice of protecting human participants in research. The following information is provided so that you can decide whether you wish to participate in the present study. Your participation is requested but is strictly voluntary.

The purpose of this study is to further understand people's ability to imagine various events. You will be asked to read some information, complete a few tasks that assess your ability to imagine and answer questions based on readings. You will also be asked to watch a movie and answer questions based on the information presented.

Although participation in this study will not directly benefit you, we believe that the information you provide will be useful in our further understanding of human cognition.

If you decide to participate, you will be free to withdraw at any time and will receive credit for your participation. If you decide not to participate in this study, please let the researcher know and she or he will excuse you from the study. You do not need to tell the researcher your reasons for choosing not to participate. If you decide to withdraw from the study, any information collected from you up to that point will be destroyed.

Any responses you provide will be confidential and will not be associated in any way with your name. No information that could identify you will be released in any form.

If you have any questions, please ask or contact:

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If you have any complaints about your treatment as a participant in this study, please contact the following individual:

**Chair, Institutional Review Board for
Protection of Human Participants
c/o Grants Office
UW Oshkosh
920-424-1415**

Although the chairperson may ask for your name, all complaints are kept in confidence.

Consent Statement: I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary, and that I may withdraw at any time.

Name

Date

This research has been approved by the University of Wisconsin Oshkosh IRB for the Protection of Human Participants for a one year period, valid until (date of approval).

APPENDIX B

Personally Relevant Introduction

You will be presented with some edited excerpts of newspaper articles published in the *Advanced Titan* in 1979. Please read through them as you would read any newspaper article. In addition, please try imagining each statement as you read it. In other words, try picturing the events in your head and imagining what it would feel like to have experienced these events. Once you have read a message, turn the page to read the next one, without back-tracking. When all excerpts have been read, you will be asked to complete a few tasks that assess your ability to imagine and your knowledge of the excerpts. After completing a task, please flip over any sheets given and remain seated and quiet for further instruction.

APPENDIX C

Not Personally Relevant Introduction

You will be presented with some edited excerpts of newspaper articles published in the Connexion in 1979. Please read through them as you would read any newspaper article. In addition, please try imaging each statement as you read it. In other words, try picturing the events in your head and imagining what it would feel like to have experienced these events. Once you have read a message, turn the page to read the next one, without back-tracking. When all excerpts have been read, you will be asked to complete a few tasks that assess your ability to imagine and your knowledge of the excerpts. After completing a task, please flip over any sheets given and remain seated and quiet for further instruction.

APPENDIX D

Personally Relevant No Retraction Story

1. A plane departed from Milwaukee Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for New York.
3. Three of the passengers were freshman students from the University of Wisconsin Oshkosh visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Sunville, Pennsylvania.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. Most of the physical possessions of the students were burned beyond recognition.
13. However, a small tote belonging to one of the students was found undamaged.
14. It contained several stuffed animals and a box of family photos.
15. Parents of the deceased students were notified on the morning of December 24th.
16. The investigation was closed exactly one month after the crash occurred.

APPENDIX E

Not Personally Relevant No Retraction Story

1. A plane departed from Paris Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for Germany.
3. Three of the passengers were freshman students from the University of Paris visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Weiler, Germany.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. Most of the physical possessions of the students were burned beyond recognition.
13. However, a small tote belonging to one of the students was found undamaged.
14. It contained several stuffed animals and a box of family photos.
15. Parents of the deceased students were notified on the morning of December 24th.
16. The investigation was closed exactly one month after the crash occurred.

APPENDIX F

Personally Relevant Negation Story

1. A plane departed from Milwaukee Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for New York.
3. Three of the passengers were freshman students from the University of Wisconsin Oshkosh visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Sunville, Pennsylvania.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. A few weeks later, investigation into the plane crash had been completed, and it was concluded that an engine malfunction was not to blame.
13. Most of the physical possessions of the students were burned beyond recognition.
14. However, a small tote belonging to one of the students was found undamaged.
15. It contained several stuffed animals and a box of family photos.
16. Parents of the deceased students were notified on the morning of December 24th.
17. The investigation was closed exactly one month after the crash occurred.

APPENDIX G

Not Personally Relevant Negation Story

1. A plane departed from Paris Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for Germany.
3. Three of the passengers were freshman students from the University of Paris visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Weiler, Germany.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. A few weeks later, investigation into the plane crash had been completed, and it was concluded that an engine malfunction was not to blame.
13. Most of the physical possessions of the students were burned beyond recognition.
14. However, a small tote belonging to one of the students was found undamaged.
15. It contained several stuffed animals and a box of family photos.
16. Parents of the deceased students were notified on the morning of December 24th.
17. The investigation was closed exactly one month after the crash occurred.

APPENDIX H

Personally Relevant Alternative Story

1. A plane departed from Milwaukee Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for New York.
3. Three of the passengers were freshman students from the University of Wisconsin Oshkosh visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Sunville, Pennsylvania.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. A few weeks later, investigation into the plane crash had been completed, and it was concluded that an engine malfunction was not to blame.
13. The actual cause was determined to be a crack in the wing.
14. Most of the physical possessions of the students were burned beyond recognition.
15. However, a small tote belonging to one of the students was found undamaged.
16. It contained several stuffed animals and a box of family photos.
17. Parents of the deceased students were notified on the morning of December 24th.
18. The investigation was closed exactly one month after the crash occurred.

APPENDIX I

Not Personally Relevant Alternative Story

1. A plane departed from Paris Airport at approximately 8:30 a.m.
2. It carried 116 passengers, headed for Germany.
3. Three of the passengers were freshman students from the University of Paris visiting friends during Christmas break.
4. A plane crash was reported in a small, wooded field near the small town of Weiler, Germany.
5. A call came in stating a plane was sighted falling from the sky with debris falling from it.
6. The situation required immediate response from emergency services, the call being made at approximately 9:30 a.m.
7. Emergency services arrived 15 minutes later, working as fast as possible despite all of the damage to the plane, and debris everywhere.
8. After a few hours of rummaging through the crash site, only 7 survivors had been found, 3 of whom were crew members.
9. The investigators on scene went through all possible causes of the crash.
10. The media station reporting live from the crash site reported that an engine malfunction was to blame for the crash.
11. Three crash site workers were taken to the hospital as a precaution after some debris had fallen on them, but they seemed to only suffer minor injuries.
12. A few weeks later, investigation into the plane crash had been completed, and it was concluded that an engine malfunction was not to blame.
13. The actual cause was determined to be a crack in the wing.
14. Most of the physical possessions of the students were burned beyond recognition.
15. However, a small tote belonging to one of the students was found undamaged.
16. It contained several stuffed animals and a box of family photos.
17. Parents of the deceased students were notified on the morning of December 24th.
18. The investigation was closed exactly one month after the crash occurred.

APPENDIX J

Imagination Word Search

Imagination

B L E P T E O E S V T H N F U
 B R L T S H R A P I C A O O N
 Z A A I A U I R W S I R I R W
 N E V I T E O N M U P B S M X
 U E R A N J R E K A E O I C P
 D B E U E S N C M L D R V Y I
 J F X C J V T E H I E E S S C
 A O T F I N N O M Z A B W A T
 I X D S Q A O U R E C C D T U
 E Z I L A E R C R M H L P N R
 V O F I G U R E O T I C F A E
 N I M A G E V N O U U D S F Q
 I M A G I N E X B I L R A T Y
 C O N C E P T U A L I Z E F F
 E V I E C R E P F T N E V N I

BRAINSTORM
 CONJURE
 DEVISE
 FEATURE
 HARBOR
 INVENT
 PICTURE
 REALIZE
 THINK

BUILD
 CREATE
 ENVISION
 FIGURE
 IMAGE
 NURTURE
 PLAN
 SCHEME
 VISION

CONCEPTUALIZE
 DEPICT
 FANTASY
 FORM
 IMAGINE
 PERCEIVE
 PROJECT
 SEE
 VISUALIZE

APPENDIX K

Video Questionnaire

You will now watch a movie that could be used in a classroom as a teaching tool. Please answer the following questions based on the information stated in the movie. Your responses and feedback will be used to further understand the effectiveness of different types of teaching tools that could be used to further a student's understanding on a variety of topics.

1. What fraction on our planet is desert?
2. What do the winds from Siberia carry to the Gobi desert?
3. How much snow should a camel consume?
4. Which desert is the largest in the world?
5. How high can dust be blown during a sand storm?
6. Which type of dune can become 300 meters tall?
7. What is the only constant presence in the desert?
8. What do kangaroos do to keep cool?
9. When are fennec foxes active?
10. Name three creatures that come out at night.
11. Which desert is the driest in the world?
12. How much water can a saguaro cactus stem hold?
13. Did this film interest you? Why or why not?
14. After watching this film, were you interested in learning more about deserts?
Why or why not?
15. After watching this film, were you interested in learning more about our planet?
Why or why not?

APPENDIX L

Test Questions

Test Questions – Recall

1. Where was the plane headed?
2. At what time was the phone call made to emergency services reporting the crash?
3. How many survivors were there?
4. What was initially reported by the media to be the cause of the crash?
5. How many crash site workers were taken to the hospital?

Test Questions - Inference

1. How could this crash have been avoided?
2. Does any aspect of the incident require further investigation?
3. What precautions could be taken in the future to ensure this doesn't happen again?
4. Why did it take so long for the investigations to complete?
5. What aspect of the plane crash should have been focused on during the investigation?
6. What do you think was the true cause of the plane crash?

APPENDIX M

Coding

Recall Questions

1. Where was the plane headed?
 - a. For Personally Relevant stories – New York
 - b. For Not Personally Relevant stories – Germany
2. At what time was the phone call made to emergency services reporting the crash?
 - a. For all stories – 9:30 a.m.
3. How many survivors were there?
 - a. For all stories – 7
4. What was initially reported by the media to be the cause of the crash?
 - a. For all stories – Engine malfunction
5. How many crash site workers were taken to the hospital?
 - a. For all stories – 3

Inference Questions – No Retraction Stories

1. How could this crash have been avoided?
 - a. Answers should reference a better inspection of the engine.
 - b. If a participant answered “Better engine check before flight”, their answer would be counted as a correct answer.
 - c. If a participant answered “Better check of the entire plane before flight”, their answer would be counted as incorrect.
2. Does any aspect of the incident require further investigation?
 - a. Answers should reference a closer inspection of the engine.
 - b. If a participant answered “Yes, why the engine malfunctioned while in the air”, their answer would be counted as a correct answer.
 - c. If a participant answered “Yes, why the plane crashed”, their answer would be counted as incorrect.
3. What precautions could be taken in the future to ensure this doesn’t happen again?
 - a. Answers should reference a better engine check or maintenance.
 - b. If a participant answered “Use a check list to make sure the engine is adequately checked before flight”, their answer would be counted as a correct answer.
 - c. If a participant answered “Use a check list to make sure the plane is adequately checked before flight”, their answer would be counted as incorrect.

4. Why did it take so long for the investigations to complete?
 - a. Answers should reference a further investigation or more thorough investigation of the engine malfunction.
 - b. If a participant answered “They weren’t sure if the engine malfunction was really the cause of the crash”, their answer would be counted as a correct answer.
 - c. If a participant answered “They weren’t sure what caused the crash”, their answer would be counted as incorrect.
5. What aspect of the plane crash should have been focused on during the investigation?
 - a. Answers should reference the engine or engine malfunction.
 - b. If a participant answered “Yes, figuring out why the engine problems had not been resolved before hand”, their answer would be counted as a correct answer.
 - c. If a participant answered “Yes, figuring out why the problems had not been resolved before hand”, their answer would be counted as incorrect.
6. What do you think was the true cause of the plane crash?
 - a. Answers should reference an engine malfunction.
 - b. If a participant answered “Engine trouble”, their answer would be counted as a correct answer.
 - c. If a participant answered “Mechanical error”, their answer would be counted as incorrect.

Inference Questions – Negation Stories

1. How could this crash have been avoided?
 - a. Answers should reference a more thorough investigation into why the crashed happened or checking the entire plane more thoroughly.
 - b. If a participant answered “Better check of the entire plane before flight”, their answer would be counted as correct.
 - c. If a participant answered “Better engine check before flight”, their answer would be counted as an inference.
2. Does any aspect of the incident require further investigation?
 - a. Answers should reference a more thorough investigation into why the crashed happened or checking the entire plane more thoroughly.
 - b. If a participant answered “Yes, why the plane crashed”, their answer would be counted as correct.
 - c. If a participant answered “Yes, why the engine malfunctioned while in the air”, their answer would be counted as an inference.

3. What precautions could be taken in the future to ensure this doesn't happen again?
 - a. Answers should reference a more thorough investigation into why the crashed happened or checking the entire plane more thoroughly.
 - b. If a participant answered "Use a check list to make sure the plane is adequately checked before flight", their answer would be counted as correct.
 - c. If a participant answered "Use a check list to make sure the engine is adequately checked before flight", their answer would be counted as an inference.
4. Why did it take so long for the investigations to complete?
 - a. Answers should reference a further understanding of why the crash happened.
 - b. If a participant answered "They weren't sure what caused the crash", their answer would be counted as correct.
 - c. If a participant answered "They weren't sure if the engine malfunction was really the cause of the crash", their answer would be counted as an inference.
5. What aspect of the plane crash should have been focused on during the investigation?
 - a. Answers should reference a more thorough investigation into why the crashed happened or checking the entire plane more thoroughly.
 - b. If a participant answered "Yes, figuring out why the problems had not been resolved before hand", their answer would be counted as correct.
 - c. If a participant answered "Yes, figuring out why the engine problems had not been resolved before hand", their answer would be counted as an inference.
6. What do you think was the true cause of the plane crash?
 - a. Answers should reference unknown or inconclusive reasons as to why the plane crashed.
 - b. If a participant answered "Unknown", their answer would be counted as correct.
 - c. If a participant answered "Engine trouble", their answer would be counted as an inference.

Inference Questions – Alternative Stories

1. How could this crash have been avoided?
 - a. Answers should reference a better inspection of the wing(s).
 - b. If a participant answered “Better check of the wings before flight”, their answer would be counted as a correct answer.
 - c. If a participant answered “Better engine check before flight”, their answer would be counted as an inference.
 - d. If a participant answered “Better check of the entire plane before flight”, their answer would be counted as incorrect.
2. Does any aspect of the incident require further investigation?
 - a. Answers should reference a closer inspection of the wing(s).
 - b. If a participant answered “Yes, why the wing cracked while in the air”, their answer would be counted as a correct answer.
 - c. If a participant answered “Yes, why the engine malfunctioned while in the air”, their answer would be counted as an inference.
 - d. If a participant answered “Yes, why the plane crashed”, their answer would be counted as incorrect.
3. What precautions could be taken in the future to ensure this doesn’t happen again?
 - a. Answers should reference a better check or maintenance of the wing(s).
 - b. If a participant answered “Use a check list to make sure the wings are adequately checked before flight”, their answer would be counted as a correct answer.
 - c. If a participant answered “Use a check list to make sure the engine is adequately checked before flight”, their answer would be counted as an inference.
 - d. If a participant answered “Use a check list to make sure the plane is adequately checked before flight”, their answer would be counted as incorrect.

4. Why did it take so long for the investigations to complete?
 - a. Answers should reference a further investigation or more thorough investigation of the wing(s).
 - b. If a participant answered “They weren’t sure if the crack in the wing was really the cause of the crash”, their answer would be counted as a correct answer.
 - c. If a participant answered “They weren’t sure if the engine malfunction was really the cause of the crash”, their answer would be counted as an inference.
 - d. If a participant answered “They weren’t sure what caused the crash”, their answer would be counted as incorrect.
5. What aspect of the plane crash should have been focused on during the investigation?
 - a. Answers should reference the wing(s) or crack in the wing.
 - b. If a participant answered “Yes, figuring out why the crack in the wing had not been fixed before hand”, their answer would be counted as a correct answer.
 - c. If a participant answered “Yes, figuring out why the engine problems had not been resolved before hand”, their answer would be counted as an inference.
 - d. If a participant answered “Yes, figuring out why the problems had not been resolved before hand”, their answer would be counted as incorrect.
6. What do you think was the true cause of the plane crash?
 - a. Answers should reference a crack in the wing.
 - b. If a participant answered “Crack in the wing”, their answer would be counted as a correct answer.
 - c. If a participant answered “Engine trouble”, their answer would be counted as an inference.
 - d. If a participant answered “Mechanical error”, their answer would be counted as incorrect.

APPENDIX N**Manipulation Check**

You have just read and imagined an event. We would like you to decide as accurately as possible using the five point scale ranging from 1 (strongly disagree) to 5 (strongly agree) whether you agree or disagree with the statements given based on the event you imagined. When you are finished please turn your questionnaire over to let the experimenter know you are finished and wait for further instructions.

	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree
The events described were plausible.	1	2	3	4	5
I could picture the events in my mind.	1	2	3	4	5
The events described in the story could happen to me.	1	2	3	4	5
The events described could happen in the location described.	1	2	3	4	5
I could visualize the events described.	1	2	3	4	5
The events described were believable.	1	2	3	4	5
I identified with the students in the story.	1	2	3	4	5
I was able to connect with the events depicted in the story.	1	2	3	4	5
I was able to imagine the events described.	1	2	3	4	5
I want to learn more about the events described.	1	2	3	4	5

APPENDIX O

Belief in the Just World Questionnaire

Indicate your degree of agreement or disagreement with each of the following statements.

	Strongly Disagree	Somewhat Disagree	Neither nor Disagree	Agree	Somewhat Agree	Strongly Agree
Basically, the world is a just place.	1	2	3	4	5	5
People who get "lucky breaks" have usually earned their good fortune.	1	2	3	4	5	5
Students almost always deserve the grades they receive in school.	1	2	3	4	5	5
People who keep in shape have little chance of suffering a heart attack.	1	2	3	4	5	5
It is rare for an innocent person to be wrongly sent to jail.	1	2	3	4	5	5
By and large, people deserve what they get.	1	2	3	4	5	5
When parents punish their children, it is almost always for good reasons.	1	2	3	4	5	5
Although evil people hold political power for awhile, in the general course of history good wins out.	1	2	3	4	5	5
In almost any business or profession, people who do their job well rise to the top.	1	2	3	4	5	5
People who meet with misfortune have often brought it on themselves.	1	2	3	4	5	5
Crime doesn't pay.	1	2	3	4	5	5

APPENDIX P

Debriefing

Thank you for participation in the study. I would like to take a few minutes to provide you with some additional information about the purpose of this study. The goal of this study is to examine how people actively process and remember events. Specifically, we are interested whether or not people are able to disregard information that they are told to ignore. Additionally, we are interested in how this ability may differ depending on whether or not the events described were personally relevant to you.

There were three different types of story lines that you may have been exposed to – although all of them were completely fictitious and involved an airplane crash.

1. The first story line contained an original cause for a plane crash that was later retracted (negation only).
2. The second story line contained an original cause for a plane crash that was later retracted and then you were given an alternative cause for the plane crash (negation with an alternative).
3. The third story line contained an original cause for a plane crash but was not retracted or given an alternative cause for the plane crash (control).

Additionally, stories either told about:

1. Students in the airplane crash that were from Oshkosh (Personally Relevant).
2. Students in the airplane crash that were from Paris (Not Personally Relevant).

Ultimately, we were interested in how much information you provided on the assessment test that might indicate that you believed the originally discredited information was actually responsible for the crash.

Finally, I would like to make it clear that we were in no way looking at or assessing your ability to imagine the story lines. You were lead to believe this was our assessment. The reason we did this was to ensure you paid close attention to the story lines that you had read.

Also, you watched a movie about a variety of deserts on our planet. The purpose of watching this movie was to create a time delay between reading the story lines and answering questions about the events described. We were in no way interested in the effectiveness of different types of teaching tools.

Do you understand why we had to lead you to believe we were assessing your ability to imagine events and the effectiveness of different types of teaching tools?

- Yes
- No

If you are ok with being lead to believe that we were assessing your ability to imagine events and the effectiveness of different types of teaching tools when we actually weren't please sign here: _____

All of the information that was collected today will be kept in complete confidentiality. There will be no way of connecting your responses with your identity. We are not interested in any one participant's responses by themselves. Rather, we are interested in the general responses of all participants when they are combined together.

Your participation today was greatly appreciated. It will help in furthering our understanding of how people actively process and interpret events. We ask that you do not discuss this research with anyone else because it could wreck the study for other participants. Also, it can call into question the validity of the research.

If you have any questions or concerns regarding your participation in this study please contact Seneca Bivens or the faculty supervisor for this project, Dr. Quin Chrobak. Both of their contact information is listed on your copy of the consent form.

Do you have any questions about this study or comments that could help me make this study better?

Questions or comments:

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