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Examining Moderators of the Hindsight Bias in the Context of Civil Legal Decision-Making: Counterfactuals, Causal Proximity, and Self-Referencing

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

EXAMINING MODERATORS OF THE HINDSIGHT BIAS IN THE CONTEXT OF
CIVIL LEGAL DECISION-MAKING: COUNTERFACTUALS, CAUSAL
PROXIMITY, AND SELF-REFERENCING

A dissertation submitted in partial fulfillment of the

requirements for the degree of

DOCTOR OF PHILOSOPHY

in

PSYCHOLOGY

by

Rachel M. York

2008

To: Dean Kenneth Furton
College of Arts and Sciences

This dissertation, written by Rachel M. York, and entitled Examining Moderators of the Hindsight Bias in the Context of Civil Legal Decision-Making: Counterfactuals, Causal Proximity, and Self-Referencing, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Florida International University, 2008

DEDICATION

I dedicate this dissertation to my family and friends, for their loving support and encouragement. I would especially like to thank my parents, who have always been there for me, and Steve, who has constantly provided a patient shoulder to lean on.

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ABSTRACT OF THE DISSERTATION
EXAMINING MODERATORS OF THE HINDSIGHT BIAS IN THE CONTEXT OF
CIVIL LEGAL DECISION-MAKING: COUNTERFACTUALS, CAUSAL
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The current research sought to clarify the diverging relationships between counterfactual thinking and hindsight bias observed in the literature thus far. In a non-legal context, Roese and Olson (1996) found a positive relationship between counterfactuals and hindsight bias, such that counterfactual mutations that undid the outcome also increased participants' ratings of the outcome's a priori likelihood. Further, they determined that this relationship is mediated by causal attributions about the counterfactually mutated antecedent event. Conversely, in the context of a civil lawsuit, Robbennolt and Sobus (1997) found that the relationship between counterfactual thinking and hindsight bias is negative. The current research sought to resolve the conflicting findings in the literature within a legal context.

In Experiment One, the manipulation of the normality of the defendant's target behavior, designed to manipulate participants' counterfactual thoughts about said behavior, did moderate the hindsight effect of outcome knowledge on mock jurors' judgments of the foreseeability of that outcome as well as their negligence verdicts.

Although I predicted that counterfactual thinking would increase, or exacerbate, the hindsight bias, as found by Roese and Olson (1996), my results provided some support for Robbenolt and Sobus's (1997) finding that counterfactual thinking decreases the hindsight bias. Behavior normality did not moderate the hindsight effect of outcome knowledge in Experiment Two, nor did causal proximity in Experiment Three.

Additionally, my hypothesis that self-referencing may be an effective hindsight debiasing technique received little support across the three experiments. Although both the self-referencing instructions and self-report measure consistently decreased mock jurors' likelihood of finding the defendant negligent, and self-referencing instructions decreased their foreseeability ratings in studies two and three, the self-referencing manipulation did not interact with outcome knowledge to moderate a hindsight bias effect on either foreseeability or negligence judgments. The consistent pattern of results across the three experiments, however, suggests that self-referencing may be an effective technique in reducing the likelihood of negligence verdicts.

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Chapter I

Introduction

The current research sought to clarify the diverging relationships between counterfactual thinking and hindsight bias observed in the literature thus far. Counterfactual thinking involves the consideration of how a given outcome may have turned out differently had some antecedent event(s) been altered. Researchers have found that the ease with which jurors are able to undo a given outcome (i.e., an accident) by counterfactually mutating the behavior of the defendant is associated with a greater likelihood of negligence judgments. Hindsight bias involves people's post-outcome overestimation of the a priori likelihood of that outcome. Hindsight bias has been researched in legal contexts, and jurors are often unable to disregard their knowledge of the outcome when making decisions about civil disputes.

In a non-legal context, Roese and Olson (1996) found a positive relationship between counterfactuals and hindsight bias, such that counterfactual mutations that undid the outcome also increased participants' ratings of the outcome's a priori likelihood. Further, they determined that this relationship is mediated by causal attributions about the counterfactually mutated antecedent event. First, mutated events are rated as more causal of the outcome than non-mutated events. Second, the greater the causal link between an antecedent event and the outcome, the more likely participants perceive the outcome to have been given the occurrence of that event, indicating hindsight bias.

Conversely, in the context of a civil lawsuit, Robbennolt and Sobus (1997) found that the relationship between counterfactual thinking and hindsight bias is negative. Specifically, when the defendant's antecedent behavior was normal and expected (thus

not eliciting counterfactual thoughts), mock jurors fell prey to hindsight bias, as was evident in their awarding more compensatory damages when the outcome was known. When the defendant's conduct was abnormal and surprising, however, likely eliciting counterfactuals, the proportion and amount of compensatory damage awards did not differ as a function of whether the outcome was known.

The current research sought to resolve the conflicting findings in the literature within a legal context. Though Robbennolt and Sobus's (1997) research involved legal decision-making, their methodology included several limitations; and Roese and Olson's (1996) more sound methods were not applied to a legal decision. Thus, the present studies generally apply Roese and Olson's design to materials involving a civil lawsuit in order to settle the apparent discrepancy in the counterfactual-hindsight relationship.

Chapter II

Literature Review

Negligence

The law states that negligence is the lack of ordinary care; that is, the failure to do an act which a reasonably careful and prudent person would do, or the doing of an act which a reasonably careful and prudent person would not do, under the same or similar circumstances to protect others from bodily injury (Restatement (Third) of Torts § 3, 2008). In order to prove that a defendant is liable for damages to a plaintiff caused by the defendant's negligence, the plaintiff must prove that the defendant's negligent act was a cause in fact of his or her injury. The but-for rule of causation in fact states, "The defendant's conduct is not the cause of the event if the event would have occurred without it" (Prosser, 1971, p. 239, as cited in Wells & Gavanski, 1989). In addition to causation in fact to prove that a defendant was negligent, a plaintiff must prove by a preponderance of the evidence that the defendant breached a duty owed to the plaintiff by failing to act with the care, skill, and diligence required in light of the risks/consequences that a reasonable person would have foreseen were associated with his or her actions. Finally, the plaintiff must prove that this breach of duty was a proximate, or legal cause of the plaintiff's damages. The definition of proximate cause includes the requirements that there must have been a connection between the conduct of the defendant that the plaintiff claims was negligent and the injury of which the plaintiff complains, and that the event that is claimed to have produced that injury was a natural and probable result of such conduct of the defendant (Falkenstein, 2005). In other words, the phrase proximate cause means an act or failure to act that in natural and probable sequence resulted in the

claimed injury. Essentially, the proximate cause requirement limits legally negligent acts to those for which it is reasonable to hold a defendant liable (Spellman & Kincannon, 2001).

Foreseeability

An additional element of the legal definition of negligence is whether the defendant could or should have foreseen the harm that could or would ultimately result from the questioned behavior. A defendant is negligent if he/she fails to use a reasonable amount of care, skill and diligence that a reasonably careful person would use in similar circumstances to avoid exposing others to a foreseeable risk of harm. Thus, an issue that jurors must consider is whether a reasonable person would or should have foreseen the potentially harmful outcome of that behavior (i.e., the plaintiff's injury).

The importance of foreseeability in negligence law has been recognized in the psychological research into the hindsight bias showing that foreseeability is often overestimated after the harm has already occurred (Harley, 2007; Hastie, Schkade, & Payne, 1999; Kamin & Rachlinski, 1995). The effects of hindsight bias on jurors' judgments about the foreseeability of the harm resulting from a defendant's actions are unfair, in that the defendant did not have the same outcome knowledge the jurors have when considering the potential risks and consequences associated with his or her conduct. Thus, jurors may find the defendant negligent even though a reasonable person would not have foreseen the potential harm resulting from the same behavior in foresight. As such a bias constitutes an injustice to defendants in negligence cases, it is important to determine in what circumstances the hindsight bias will unfairly influence jurors' judgments and to develop debiasing techniques that effectively ameliorate or even eliminate the bias in jury

decision-making. The current research will test the relationships between several variables that may moderate jurors' hindsight bias, including counterfactual thinking, causal proximity, and self-referencing. The primary purpose of this research is to clarify the diverging relationships between counterfactuals and the hindsight bias observed in the literature thus far. An additional purpose of the current research is to explore the moderating roles of causal proximity and self-referencing on the hindsight bias, specifically examining self-referencing instructions as a potentially effective hindsight debiasing technique.

In Chapter III, I will describe the literature on the hindsight bias, particularly that within the context of legal decision-making, followed by a discussion of the various hindsight debiasing techniques researched thus far. In Chapter IV, I will review the literature on the moderators of the hindsight bias explored by the current research. I will discuss counterfactuals, especially the research conducted in the context of legal decision-making. I will also describe two divergent conceptual and empirical integrations of counterfactual thinking, causal attributions, and the hindsight bias. Second, I will describe the causal primacy effect observed in the counterfactual literature as well as the concept of causal proximity as it relates to judgments of foreseeability and responsibility of an antecedent event for an outcome. Third, I will discuss the concept of self-referencing and explain how, as a potential moderator of the hindsight bias, this cognitive process may be employed as an effective debiasing technique by the legal system. Finally, I will integrate the literatures on each of these phenomena to outline and explain my hypotheses for the current research. In Chapter V, I will describe the methods and results of the first experiment included in this research. Chapter VI will include a

description of the methods and results of the second experiment, and I will describe the methods and results of the third experiment in Chapter VII. Finally, Chapter VIII will include a general discussion of the theoretical and practical implications of the results of all three experiments involved in this research.

Chapter III

Hindsight Bias

The hindsight bias involves people's post-outcome overestimation of the a priori likelihood of that outcome (Christensen-Szalanski & Willham, 1991; Guilbault, Bryant, Brockway, & Posavac, 2004; Hawkins & Hastie, 1990). Thus, ratings of the foreseeability of a given outcome based on information about antecedent events are essentially measures of hindsight bias. Research has consistently shown that people are unable to return to their pre-outcome perspectives once they are aware of the outcome. Hawkins and Hastie (1990) have proposed that the cognitive mechanism behind this effect is the process of "rejudgment," by which people attempt to make sense of the past by imposing simplicity and causal structure on their recollections of it. According to Fischhoff (1975), outcome information is quickly and easily assimilated into our representations of the past, thus influencing our perceptions of the causal structure of past outcomes. This cognitive explanation of the hindsight phenomenon is labeled "creeping determinism" and has been found to be the most common mechanism underlying observed hindsight bias effects (Hawkins & Hastie, 1990). The exaggerated belief that a given outcome was highly predictable beforehand results from a process of selective recall and interpretation of antecedent information congruent with the outcome in a backward fashion (Lowe, 1992), which leads to strong casual inferences linking specific antecedent events to the outcome (Wasserman, Lempert, & Hastie, 1991). Due to the automaticity and strength of these after-the-fact causal links, people have difficulty considering the possibility of alternative outcomes (Fischhoff, 1975; Schkade &

Kilbourne, 1991). Thus, in comparison to the uncertainty of future possibilities, past outcomes come to be seen as clear, understandable, and predictable.

Hindsight Bias in Legal Decision-Making

The hindsight bias has been explored by psycholegal researchers in the context of the legal system (Harley, 2007). Jurors in civil trials are asked to render judgments about a defendant's actions prior to a given outcome (i.e., a plaintiff's injury) after the outcome is known. They are supposed to set aside knowledge of the outcome when determining whether the defendant breached a duty to the plaintiff by failing to act with reasonable care, whether the defendant's actions were a cause in fact of the plaintiff's damages, as well as whether those actions were a proximate, or legal, cause of the plaintiff's damages. Jurors' determinations of proximate/legal cause include an assessment of whether the given outcome was, could, or should have been foreseeable at the time of the defendant's actions. In the context of negligence judgments, one could draw the conclusion that the hindsight bias, or exaggerated certainty of the likelihood of an outcome given certain antecedent events, would be accompanied by an increase in jurors' judgments that the outcome was highly foreseeable given those antecedent events (i.e., the defendant's actions). Civil jurors are faced with the task of reaching a liability decision based only on the evidence about events that occurred prior to the outcome, setting aside their knowledge that the given outcome resulted from those antecedent events (Devitt, Blackmar, & Wolff, 1987). Research has shown, however, that jurors are often unable to disregard their knowledge of the outcome when making decisions about civil disputes and that they incorporate this information into their verdicts, falling prey to the hindsight bias.

Much of the research examining the effects of hindsight in the context of legal decisions has focused on civil cases brought against police officers by victims of illegal search and seizure. Specifically, Casper, Benedict, and Kelly (1988) had mock jurors decide such a case, manipulating jurors' knowledge of the outcome of the search. Some participants received no outcome information (whether or not illegal material was found during the search), some were told that the officers did not find any illegal material, and a third group was told that the officers did find illegal material during the search. Those mock jurors who were told that illegal material was found awarded significantly less money in punitive damages than those not informed of the outcome of the search. In a second, similar study by these researchers, mock jurors informed that illegal material was found during the search awarded less compensatory and punitive damages than those told that no illegal material was found. Additionally, there was no evidence of hindsight bias on the damages awarded by those participants not informed of the search's outcome (Casper, Benedict, & Perry, 1989). The influence of knowledge about search outcomes on damage awards was mediated by mock jurors' interpretations and memory of the evidence in both of these studies. Specifically, mock jurors interpreted and remembered/misremembered evidence as being consistent with the outcome of which they were informed (i.e., consistent with illegal material being found and the plaintiff's guilt or consistent with no illegal material being found and the plaintiff's innocence).

Hastie, Schkade, and Payne (1999) also found evidence of the hindsight bias affecting judgments of liability for punitive damages in an environmental damages civil suit. Specifically, participants watched a videotaped summary of the circumstances surrounding the incident, which involved a railroad company who failed to comply with

an order to stop operating on a section of track declared hazardous. Half of the participants made their judgments in the role of a juror rendering a verdict, while the other half participated in the role of a citizen asked for his/her personal opinion. Additionally, one-third of the participants were asked to judge the risk associated with the railroad failing to comply with the order in foresight, while two-thirds assessed the risk in hindsight with the knowledge that a train had derailed on this section of track, spilling a toxic detergent into a river. Half of the participants in the hindsight condition were informed that the train derailment had caused \$240,000 in environmental damages, and the other half were informed that the accident caused \$24,000,000 in damages. The researchers found significant foresight-hindsight differences on almost all of their dependent measures. Specifically, 33% of participants in the foresight condition felt that the railroad should not be allowed to continue operations on the specified section of track whereas 67% of participants in the hindsight condition found that the railroad's actions were reckless enough to warrant punitive damages. The hindsight bias was also observed in participants' estimates of the probability that a serious accident would result from continued operations on the hazardous track, in that probability estimates were almost twice as high in the hindsight versus foresight condition. Additionally, participants were asked whether there is (foresight condition) or was before the accident occurred (hindsight condition) "a grave danger or risk of harm that was a foreseeable and probable effect of the existing condition of the railroad tracks." Again, those participants in the hindsight condition answered affirmatively almost twice as often as those in the foresight condition. Hindsight effects were also observed on participants' answers to questions regarding each of the legal elements underlying judgments of liability for punitive

damages. Interestingly, participants playing the role of jurors demonstrated a slightly smaller hindsight bias when judging liability than those playing the role of citizens. Further, the amount of damages caused by the train derailment had no effect on any of the dependent measures.

Kamin and Rachlinski (1995) conducted a similar experiment in which participants rendered judgments about whether a municipality should take or should have taken precautions to protect a property owner from flood damage. Those participants making decisions in foresight did so in the context of an administrative hearing, while those participating in hindsight did so in the context of a trial. Half of the participants in the hindsight condition also heard debiasing instructions from the judge encouraging them to consider the influence of hindsight on their decisions and to consider alternative outcomes as the municipality had done in foresight. Three-fourths of the foresight participants concluded that a flood was not likely enough to justify the municipality taking further precautions; however, a majority of the hindsight participants found the municipality's failure to take precautions negligent. Additionally, participants in the hindsight conditions estimated the probability of a flood to be significantly higher than those in the foresight condition. Unfortunately, the judgments of the participants in the hindsight debiasing condition did not differ from those in the regular hindsight condition.

Hindsight Debiasing Techniques

Most research has found that techniques designed to ameliorate the hindsight bias are ineffective (Fischhoff, 1982). Specifically, debiasing strategies relying on increasing people's motivation to avoid the bias (Davies, 1987; Fischhoff, 1977), increasing the personal relevance of the task for participants (Connolly & Bukszar, 1990), rewards for

unbiased responses (Hell, Gigerenzer, Gauggel, Mall & Muller, 1988), and alerting people to the influence of hindsight bias on their own judgments (Fischhoff, 1977; Kurtz & Garfield, 1978; Wood, 1978) have all proven ineffective. Some cognitive strategies have been identified that achieve limited debiasing, such as restructuring the decision-making task (Fischhoff, Slovic, & Lichtenstein, 1978) and instructing participants to consider alternative outcomes (Arkes, Faust, Guilmette, & Hart, 1988; Einhorn & Horgan, 1986), but no technique researched thus far has been able to completely eliminate the hindsight bias.

In the context of legal decision-making, Wexler and Schopp (1989) suggested that civil trials be bifurcated so that negligence judgments would not be influenced by outcome information. Although there is some evidence that bifurcation decreases juries' attributions of liability to defendants (Horowitz & Bordens, 1990; Zeisel & Callahan, 1967), it is an imperfect and relatively impractical solution. Although jurors may be kept uninformed as to the details of the outcome (i.e., the type and seriousness of a plaintiff's damages), they would almost inevitably be aware that some accident had occurred when asked to determine negligence. Wexler and Schopp also suggested the use of jury instructions incorporating successful debiasing techniques, such as the consideration of alternative outcomes, expert testimony highlighting the robustness of hindsight bias effects and explaining effective debiasing techniques, as well as attempts by the defense attorney to restructure the case or introduce alternative decision-making heuristics, such as counterfactual thinking, that may be more favorable to the defense.

Following this logic, Stallard and Worthington (1998) attempted to reduce hindsight bias in mock jurors' decisions regarding a commercial litigation case by

including a debiasing message in the defense attorney's closing argument. Specifically, the defense attorney tried to focus mock jurors' attention on the time prior to the occurrence of the outcome. First, the attorney informed participants of the plaintiff's strategy to turn them into "Monday-morning quarterbacks" who would judge the defendants based on the information they had now versus on that which the defendants had at the time of their questioned decisions. Second, the attorney appealed to the mock jurors to not use hindsight when judging the defendants by reminding them not to second-guess the decisions made by the defendants long ago. Stallard and Worthington's defense attorney debiasing technique appears to be successful at reducing the hindsight bias in jurors' judgments about defendants' actions. Mock jurors' judgments in the hindsight debiasing condition were similar to (in fact they did not significantly differ from) those in the foresight condition. Specifically, participants in the foresight and hindsight debiasing conditions were significantly less likely than those in the regular hindsight condition to find the defendants negligent (29% and 37% versus 57%, respectively).

Chapter IV

Other Possible Moderators of the Hindsight Bias

This research identifies three other possible moderators of the hindsight bias: counterfactual thinking, causal proximity, and self-referencing. Since the hindsight bias depends on people's difficulty in considering alternative outcomes, counterfactual thinking may be an effective debiasing technique, because people do consider alternative outcomes when engaging in counterfactual thinking. For example, people may ponder, "if only event X had not occurred, the outcome would have been different." However, when judging the probability of the outcome occurring given the presence of the specific antecedent events that led to that outcome, imagining how things could have turned out differently may prove very difficult. Thus, counterfactual thinking may not ameliorate the hindsight bias, and may even exaggerate it. This is the theory behind Roese and Olson's (1996) conceptual integration of counterfactuals, causal attributions, and the hindsight bias, which is discussed in detail below. Another concept related to the consideration of alternative outcomes, also described below, is self-referencing. Specifically, if people are able to put themselves in the shoes of another at some time prior to the occurrence of the outcome, they may recognize that alternative outcomes would have seemed possible at that antecedent point.

Counterfactuals

Counterfactual thinking involves the consideration of how a given outcome may have turned out differently had some antecedent event(s) been altered. As such, counterfactual thoughts usually include a conditional, if only, statement that mutates an antecedent event, leading to a different, usually more positive, outcome. Counterfactuals

are pervasive in everyday cognitions, and are most often spontaneously generated in response to negative events (Klauer & Migulla, 1995; Roese, 1997; Roese & Olson, 1997; Sanna & Turley, 1996). Counterfactual thinking has also been shown to influence causal judgments (Roese & Olson, 1995) as well as judgments of fault and blame (Wells & Gavanski, 1989).

Although strongly related, it is clear that counterfactual thinking and causal reasoning are not the same, because the most frequently mutated antecedent events are not always those seen as the most causal of the outcome (Spellman & Kincannon, 2001). Specifically, N'gbala and Branscombe (1995) presented participants with a story about a father who did not pick up his son from school, so a neighbor gave the boy a ride, but a drunk driver hit the neighbor's car, injuring the little boy. Although participants most often mutated the father's failure to pick his son up from school when asked to respond how the outcome might have been different "if only...", they rated the drunk driver's actions as most causal of the boy's damages. Similarly, Mandel and Lehman (1996) presented participants with a variation of a car accident scenario first used by Kahneman and Tversky (1982) in which a man who took an unusual route home braked hard to stop at a yellow light, but was killed when a driver high on drugs hit his car after he began to cross the intersection once the light turned green. One group of participants was asked to finish an "if only" thought by the protagonist while another group was asked to describe what the protagonist would think was the cause of the accident. Again, participants most often mutated the protagonist's decision to take an unusual route home but were most likely to list the high driver's actions as the accident's cause. These researchers have concluded that tasks requesting mutations of antecedent events that will undo an

outcome, or for events that could have prevented the outcome, and those that request causal attributions/ratings ask fundamentally different questions. Thus, they maintain that people use different reasoning processes to arrive at the different judgments (Mandel & Lehman, 1996; Spellman & Kincannon, 2001).

Counterfactuals in Legal Decision-Making

Attributions of responsibility and blame are explicitly made in the legal arena on a regular basis, and one might assume that counterfactual reasoning plays a role in many judgments of a defendant's liability or guilt. In fact, tort law actually encourages jurors' use of counterfactual thinking in the *sine qua non*, or but-for rule described above by which they are asked to determine whether a defendant's conduct was a cause in fact of a plaintiff's damages (Wells & Gavanski, 1989).

The jury's task in a civil negligence suit explicitly involves making a judgment about the causal nature of a defendant's allegedly negligent conduct. If the defendant's act (or failure to act) is determined to have caused the plaintiff's injury through some causal sequence, that conduct may be considered both a cause in fact and a proximate cause of the injury. In determining whether a defendant's negligent act caused a given injury, jurors may engage in counterfactual thinking. Specifically, they may mutate the defendant's conduct in order to determine whether the outcome (i.e., injury) would have been different, or non-existent, "if only" the defendant had chosen another path of action. As noted above, such counterfactual thinking can increase people's perceptions of the causal role that the mutated antecedent event (i.e., the defendant's action/inaction) played in a given outcome (Branscombe, Crosby, & Weir, 1993; Branscombe & Weir, 1992; Roese & Olson, 1996, 1997; Wells & Gavanski, 1989). Additionally, research has shown

that counterfactuals have similar effects on judgments of blame and responsibility for mutated antecedent events (Branscombe & Weir, 1992; Macrae, 1992; Macrae & Milne, 1992; Macrae, Milne, & Griffiths, 1993; Miller & Gunasegaram, 1990; Turley, Sanna, & Reiter, 1995).

The counterfactual literature has consistently shown that people most often mutate antecedent events such that abnormal behavior (e.g., not doing something in the usual manner, such as taking a different than usual route home or driving home at a different time than usual), or that which violates social norms and expectations (e.g., a taxi driver refusing to take a paraplegic couple or a boss ordering for an employee at a restaurant), is returned to normality, or to that which meets social norms and expectations (Buck & Miller, 1994; Kahneman & Miller, 1986; Kahneman & Tversky, 1982; Miller, Taylor, & Buck, 1991; Miller, Turnbull, & McFarland, 1990; Wells, Taylor, & Turtle, 1987). McCloy and Byrne (2000) demonstrated that people most often alter inappropriate antecedent behavior (i.e., someone arriving late for an appointment because he stopped to visit his parents (appropriate) versus to eat a hamburger (inappropriate)), and Segura and McCloy (2003) found that participants were more likely to mutate a selfish behavior (reading a magazine) than a number of more selfless behaviors (household chores) in a sequence of antecedent events. In the context of negligence decisions, the normality, inappropriateness, and/or selfishness of a defendant's antecedent conduct may be related to the foreseeability and level of the risk associated with that conduct. For example, if a defendant chooses a course of action with more foreseeable risk of greater harm to others, jurors may view this behavior as abnormal, inappropriate, and/or selfish. Thus, the foreseeability of harm associated with the defendant's conduct may influence whether

jurors spontaneously mutate that behavior with a counterfactual conditional to determine its causality of the plaintiff's negative outcome.

Researchers have specifically examined the influence of counterfactual thinking on mock jurors' judgments of negligence (e.g., Bothwell & Duhon, 1994; Miller & Gunasegaram, 1990; Spellman & Kincannon, 2001). For example, Wiener et al. (1994) had participants review a summary of an appellate case involving a work accident and list all the ways in which the accident could have been undone. Participants' evaluations of the defendant's behavior were influenced by the ease with which they were able to mutate the defendant's behavior, specifically the negligent act. In addition, Wasserman (2000) found that a significant determinant of counterfactual thinking is the abnormality of the antecedent events preceding an outcome. In her first study, Wasserman varied the normality of a defendant's conduct such that either an individual or corporate defendant exhibited compliance with or violation of an interpersonal or social norm. Her results indicated that antecedent abnormality elicited more upward counterfactuals and that participants were most likely to restore a defendant's norm-violating behavior to that of norm compliance. Further, interpersonal norm violation resulted in greater judgments of blame, responsibility, control, and negligence. In Wasserman's second study, participants read a summary of a civil lawsuit in which the interpersonal normality of both an individual plaintiff's and a corporate defendant's antecedent behaviors were varied. With this scenario, she found that interpersonal norm violation resulted in greater judgments of responsibility, blame, control, causality, and negligence on behalf of the individual plaintiff, but not for the corporate defendant.

The results of such research suggest that the ease with which jurors are able to undo a given outcome (i.e., an accident) by counterfactually mutating the behavior of either the defendant or plaintiff will affect their judgments of negligence. Specifically, more mutable defendant actions, those which are seen as abnormal and/or violating social or interpersonal norms (such as those with a highly foreseeable risk of harm to others) and are thus easier to return to the norm, will result in greater judgments of blame, responsibility, control, and ultimately, negligence on behalf of the defendant. Conversely, highly mutable plaintiff actions, which lend themselves to easily accessible counterfactuals, will lead to perceptions of greater plaintiff responsibility and less defendant responsibility for the unfortunate outcome, thus decreasing judgments of the defendant's negligence.

Integrating Counterfactuals, Causal Attributions, and the Hindsight Bias

Roese and Olson (1996) and Williams, Lees-Haley, and Brown (1993) have provided a conceptual integration of counterfactual thinking, causal attributions, and the hindsight bias. Roese and Olson demonstrated, through three studies, that counterfactual thinking actually increases the hindsight bias and that this effect is mediated by causal attributions. In the first study, the researchers manipulated whether an antecedent event (a student taking medication for panic attacks) was frequently or rarely successful. This manipulation was designed to influence whether counterfactual thoughts about the student taking versus not taking the pills would undo the outcome (poor performance on an exam), which the researchers predicted would increase the hindsight bias compared to conditions under which counterfactual manipulations of the antecedent event would not undo the outcome. Roese and Olson also manipulated the outcome in this scenario, such

that the student's performance on the exam was considered neutral and not surprising, mildly negative and surprising, or extremely negative and surprising.

The researchers' hypotheses were supported by the results of this study. They essentially replicated the finding of Wells and Gavanski (1989) in that counterfactual mutations that undid the outcome increased participants' ratings of the causality of that antecedent event relative to counterfactuals that did not undo the outcome. More importantly, Roese and Olson (1996) also found a positive relationship between counterfactuals and the hindsight bias, such that counterfactual mutations that undid the outcome also increased participants' ratings of the outcome's a priori likelihood. Additionally, the counterfactual manipulation had the strongest effect on hindsight ratings when the outcome was extremely negative and unexpected. The researchers concluded that people's desire to make sense out of unexpected and/or undesirable outcomes heightens the positive effect of counterfactual thinking on the hindsight bias.

One criticism of the first experiment was that it did not test the hindsight bias with the traditional paradigm, in that all participants rated the predictability of the outcome after-the-fact, precluding a comparison of predictability ratings for participants exposed and not exposed to outcome information. Thus, in their second study Roese and Olson (1996) manipulated a critical decision made by an actor (a choice between three alternatives) as well as the outcome information provided to participants (no outcome, positive outcome, or negative outcome). The goal of this study was to demonstrate the occurrence of the hindsight bias with a traditional between-subjects paradigm while assessing the mediating role of causal attributions in this effect. Specifically, participants were asked to rate the likelihood of the outcome given the occurrence of the antecedent

event they had read about as well as given alternative circumstances. The researchers' hypothesis was that participants exposed to outcome information would only demonstrate the hindsight bias if they judged the outcome's likelihood given the presence of the antecedent event. Conversely, the researchers predicted that these participants would actually rate the outcome as less probable than no-outcome participants when asked to rate its likelihood given the absence of the antecedent event. Essentially, Roese and Olson propose that the hindsight bias results from the elaboration of a specific antecedent-outcome linkage, and that causal attribution is what leads people to exaggerate their after-the-fact certainty of the outcome. However, because that antecedent-outcome linkage is so strong, when people are asked to consider the a priori likelihood of the outcome given the absence of that antecedent, they are just as certain that the outcome would not have occurred as it did. In other words, the greater a participants' certainty that an outcome was highly likely given a specific antecedent event, the greater his/her certainty that a change in that antecedent would have led to a different outcome.

Roese and Olson (1996) found evidence of the hindsight bias in this experiment both within-participants and for the between-participants exposed to the negative outcome. They also found evidence to support their hypothesis that the hindsight bias would only emerge when the antecedent decision previously read about (and thus incorporated into an antecedent-outcome link) was included as a conditional in the likelihood estimate question. Specifically, participants who read that the protagonist had chosen the second of three options gave higher ratings of the a priori likelihood of the obtained outcome given the protagonist chose the second option than when they were

asked to estimate the probability of the outcome given the protagonist had chosen option three and vice versa. Additionally, participants' agreement with prescriptive statements about what the protagonist "should have done" varied as a function of their beliefs about whether that choice or its alternative resulted in success or failure. Further, in one pairwise comparison, participants who received negative outcome information were significantly more certain than those who did not receive outcome information that the protagonist should have chosen the alternative option (i.e., the one he did not choose in their versions of the story) for a successful outcome.

Finally, Roese and Olson (1996) conducted a third experiment intended to integrate the findings of their first two studies in one experimental design, combining the between-subjects hindsight paradigm (Fischhoff, 1975) with the traditional counterfactual paradigm (Miller & McFarland, 1986). In this experiment, the researchers employed two manipulations of counterfactual availability in the story presented to participants. They manipulated antecedent exceptionality by informing participants that the protagonist took either his usual route or an unusual route on the way to the airport. They also manipulated outcome closeness by informing participants that the protagonist missed his flight by five or 60 minutes. In order to assess the hindsight bias, a control group read the same scenario, including the manipulation of exceptionality, with no outcome information. After participants read the story about a protagonist who takes either a usual or unusual route to the airport and misses his flight by five or 60 minutes (or read no outcome information), the researchers assessed their hindsight likelihood ratings, causality ratings of the antecedent event (route taken), as well as a manipulation check for counterfactual thoughts. They expected participants' causal and hindsight ratings to be higher in the

exceptional antecedent condition but not to be affected by the manipulation of outcome closeness. They also expected the effect of antecedent exceptionality on hindsight bias to be mediated by causal attributions, such that when causal ratings are held constant the effect would become non-significant but that the effect of counterfactual thoughts on causal ratings would remain significant when hindsight ratings were held constant.

The manipulation checks on participants' counterfactual thoughts found that the manipulations of counterfactual availability were successful. Specifically, participants reported more counterfactual thoughts in the exceptional versus routine antecedent condition as well as in the near miss versus far miss condition. Roese and Olson (1996) also observed the traditional hindsight bias, in that participants who received outcome information (near miss and far miss conditions collapsed) rated the outcome as significantly more likely than those who did not receive outcome information. Importantly, the researchers found additional evidence that counterfactuals increase the hindsight bias. Specifically, an exceptional antecedent event increased participants' ratings of the outcome's likelihood only among participants who had received outcome information, and the closeness of the outcome did not influence likelihood ratings for any of the participants. Further, participants attributed greater cause to the protagonist's actions when they were exceptional versus routine, but their causal ratings were unaffected by the closeness of the outcome. Finally, the researchers found modest support for their hypothesis that causal attributions mediate the relationship between counterfactual thoughts and the hindsight bias versus hindsight bias mediating the relationship between counterfactuals and causal judgments. When controlling for causal ratings, the effect of antecedent exceptionality on outcome likelihood ratings was reduced

to a marginal significance level, but when controlling for likelihood ratings, the effect of antecedent exceptionality on causal ratings did not change. The researchers acknowledge that their hypothesized mediational findings were weak and suggest that other, unexamined variables may also mediate the relationship between counterfactual thinking and the hindsight bias. They note, however, that their findings are more consistent with their hypothesis than with the alternative hypothesis that hindsight bias mediates the effect of counterfactuals on causal judgments.

Alternative Relationship between Counterfactuals and the Hindsight Bias

Robbennolt and Sobus (1997) propose that the relationship between counterfactual thinking, elicited by abnormal and surprising outcomes, and the hindsight bias is negative. Specifically, these researchers suggest that information about an expected, normal outcome will elicit the traditionally observed hindsight effect on after-the-fact estimates of the outcome's likelihood. However, they maintain that knowledge of an unexpected, abnormal outcome, which should elicit counterfactual thoughts, will reduce the hindsight bias. These researchers presented mock jurors with vignettes describing a civil suit brought against a police officer who had used a drug courier profile to pull over and search an automobile, injuring two young men in the process of forcefully removing them from the vehicle. Participants learned that the officer was either very successful at employing the drug courier profile (i.e., he uncovered drugs in three out of four searches) or very unsuccessful (i.e., he uncovered drugs in only one out of ten searches). This information was intended to manipulate counterfactual thoughts, such that participants who thought the officer was successful at using the profile would find his success at finding drugs in the plaintiffs' car normal and expected and would therefore

not engage in counterfactual thinking about the incident. Conversely, those who thought the officer was unsuccessful at employing the profile would find his success at finding drugs in the plaintiffs' car abnormal and unexpected and would engage in counterfactual thinking about the search. The researchers did not indicate what those counterfactuals might be and did not actually measure participants' counterfactual thoughts, so it is unclear what specific antecedent events they hypothesized participants would mutate. One could speculate, however, that the thoughts elicited by the abnormal, unexpected scenario might include, "If only the officer had not applied the unreliable drug courier profile, he would not have pulled over the plaintiffs," or "If only the plaintiffs had driven by another police officer, who was more successful at applying the drug courier profile, they would not have been pulled over."

In order to manipulate hindsight bias, Robbennolt and Sobus either did not provide participants with any information regarding the outcome of the officer's search, informed them that the search was unsuccessful, or informed them that the search was successful at uncovering drugs and drug contraband. The researchers predicted that mock jurors' sympathy for the plaintiffs and the amount of damages awarded would exhibit the typical hindsight bias, such that they would be lower when the officer's search was successful versus unsuccessful at uncovering drugs but only when participants thought the officer was effective at using the drug courier profile (so finding drugs was a normal, expected event). When participants thought the officer was ineffective at employing the profile and finding drugs was an abnormal, unexpected event, the researchers did not expect any differences in sympathy for or damages awarded to the plaintiffs as a function

of outcome information. Essentially, the researchers predicted that counterfactual thinking would moderate the hindsight bias effect.

Robbennolt and Sobus's (1997) hypothesis was modestly supported. The expected interaction between profile effectiveness and search outcome was marginally significant, such that more participants awarded compensatory damages and the awards were significantly higher when the officer's search did not turn up any drugs but only when the search was normal and expected based on his effectiveness at using the profile. The compensatory damages awarded by participants who were unaware of the outcome of the officer's search did not significantly differ from those awarded by participants in either of the two outcome conditions. When the search was abnormal and surprising, thus likely eliciting counterfactual thoughts about the plaintiffs' outcome, the proportion and amount of compensatory damage awards did not differ as a function of whether the search did or did not turn up drugs (or whether participants were not informed of the outcome of the search). The measures of punitive damage awards and sympathy for the plaintiffs did not demonstrate this hypothesized interaction, however. Punitive damages were higher when the drug courier profile was ineffective versus effective, but they were not influenced by the outcome of the search. Conversely, sympathy for the young men was not affected by the effectiveness of the drug courier profile, but it was higher when the officer's search was unsuccessful versus successful at finding drugs. Sympathy ratings for those participants with no outcome information were more similar to those of participants in the no-drugs-found outcome condition. Robbennolt and Sobus concluded that counterfactual thinking likely moderates the effects of hindsight on legal decisions about compensation but not those concerning punishment or sympathy.

Further, Robbennolt and Sobus (1997) investigated mediational mechanisms behind the effects of counterfactual thinking and hindsight bias on damage awards as suggested by previous research. Specifically, the counterfactual literature has indicated that affective reactions to an event, sympathy in particular, may mediate the effects of counterfactual thinking on judgments about the event (Gleicher et al., 1990; Kahneman & Miller, 1986; Macrae & Milne, 1992; Macrae, Milne, & Griffiths, 1993). Additionally, Casper, Benedict, and Perry (1989) found that mock jurors' evidence interpretation mediated the effects of hindsight bias on damage awards. Robbennolt and Sobus partially replicated the model advanced by the counterfactuals literature, in that sympathy did mediate the effect of counterfactual thinking on compensatory damage awards but not punitive damage awards. They also replicated Casper, Benedict, and Perry's model of decision-making, in that evidence interpretation mediated the effects of hindsight bias as well as counterfactual thinking on both compensatory and punitive damage awards. With both mediating variables in the model, however, sympathy alone appears to mediate the effects of both hindsight and counterfactuals on compensatory damage awards whereas both sympathy and evidence interpretation mediate the effects on punitive damages, although the indirect path through sympathy appears stronger. The current research will endeavor to reconcile the conflicting relationships between counterfactuals and the hindsight bias observed by Roese & Olson (1996) and Robbennolt & Sobus (1997).

Causal Primacy Effect in Counterfactual Thinking

A consistent finding in the literature on counterfactual thinking is that people most often mutate the first event in a causal sequence of events, a tendency labeled the causal primacy effect (Wells et al., 1987). This effect has been found with both two- and

four-event sequences (Segura & Fernandez-Berrocal, 2002; Wells et al., 1987).

Researchers have proposed that the first event in a causal chain may be perceived as more mutable because people assume that by altering or removing the initial causal event, the subsequent causes and effects in the sequence will also be eliminated, thus undoing the ultimate outcome (Wells et al., 1987). While the causal primacy effect is robust, two- and four-event sequences may not be representative of the lengthy causal chains that occur in everyday life, specifically those that might lead from a defendant's negligent conduct to a plaintiff's injury.

Segura and McCloy (2003) found that the temporal order effect, another robust tendency for people to generate counterfactuals most often for the last event in a sequence of independent events, was only significant in everyday situations when the outcome was preceded by a sufficient number of antecedent events (specifically, nine versus three or six events). Thus, it is possible that the causal primacy effect only emerges when there are sufficiently few events between the first event and final outcome, such that the causal connection between the initial event and outcome remains relatively clear and direct. For example, Miller and Gunasegaram (1990) maintain that the first antecedent event in a sequence will be the one most often mutated if the events form a causal chain, whereas the last antecedent event in a temporal sequence will be the one most often mutated if the events are causally independent. If, as may happen in everyday life, there are several intermediate events between the initial cause and final outcome, the causal chain may become less clear, even distorted. Thus, people may no longer be most prone to mutate that first causal event, because it is no longer clearly seen as the necessary and sufficient initiating cause of the outcome in question. In a parallel

literature, some research has indicated that antecedent events early in a sequence are perceived as more causal of an outcome than those later in the sequence (Johnson et al., 1989; Vinokur & Ajzen, 1982) while some has suggested the opposite (N'gbala & Branscombe, 1995). However, Spellman (1997) demonstrated that the influence of the temporal order of antecedent events on their perceived causality of an outcome is negligible. Rather, the contribution of each antecedent event to the outcome is what determines its relative causality.

Causal Proximity

The causal proximity of an antecedent event to an outcome is also related to the length of the chain of intermediate events leading from the given antecedent to the outcome. Specifically, causal proximity is defined by how long the causal chain is between the initiating event (i.e., the defendant's action) and the outcome (i.e., the plaintiff's injury) (Spellman & Kincannon, 2001). Beginning with the initiating event, a causal chain of events includes all subsequent antecedent events caused by that initial event and those resulting thereafter, culminating in the observed outcome. A causal chain may be relatively short, perhaps including only the initiating event and the outcome. On the other hand, causal chains may be relatively long, including several intermediate antecedent events between the initial event and the outcome. Research on the causal primacy effect in counterfactual thinking as well as that on the effects of an event's causal proximity to an outcome on judgments of that event's causality, foreseeability, and responsibility for the outcome have both manipulated the number of intermediate events between the examined antecedent and outcome to test the limits of perceived causality.

Research by Brickman, Ryan, and Wortman (1975) indicated that causal chains that were relatively long and complicated were sometimes related to lower ratings of the original antecedent event's foreseeability and responsibility for the outcome. However, Brickman et al. did not hold the original event and subsequent outcome constant when manipulating the length and complication of causal chains, so it is unclear whether their findings might be an artifact of the particular sequences used in each condition. Ten years later, in the context of legal decision-making, Johnson and Drobny (1985) manipulated both the temporal and causal, or mechanical, proximity of a critical antecedent event to a given outcome in two experiments examining two case vignettes each. Temporal proximity was manipulated by informing participants that the plaintiff in a civil liability suit suffered his injury either one day or one year after the defendant's allegedly negligent act. Causal proximity was manipulated by presenting participants with either a simple (one mediating event) or complex (three mediating events) chain of mediating events between the defendant's action and the plaintiff's injury. For both vignettes examined in both studies, the more complex causal chain resulted in less certainty that the defendant could have foreseen and should be held liable for the plaintiff's injury. Additionally, in one of the two vignettes used in the first experiment and both vignettes in the second experiment, the complex causal chain was associated with perceptions that the defendant had less control over the events and that the defendant was less negligent. Interestingly, Johnson and Drobny provided participants with State of California civil jury instructions on negligence and liability in both experiments and added the following specific phrase to those presented in the second study: "A person may be liable if his negligence is a substantial factor in causing an injury, and he is not relieved of liability

because of the intervening act of a third person (or persons) if such act was reasonably foreseeable at the time of his negligent conduct” (from BAJI instruction 3.79 from *California Jury Instructions Civil, Book of Approved Jury Instructions, 1977; Vesely v. Sager, 1971*, as cited in Johnson & Drobny, 1985). With the addition of this clause, the researchers hoped to clarify that a defendant is still liable for a negligent act that is a proximate cause of a plaintiff’s injury even if other causal events intervene between the defendant’s action and the injury, so long as those mediating acts were reasonably foreseeable at the time the defendant acted. Even provided this specific instruction, however, participants in their research still found defendants significantly less negligent and less liable and the plaintiff’s injury to be less foreseeable when the causal chain included mediating events (and was thus less causally proximate).

Self-Referencing

An as yet unexplored hindsight debiasing technique involves encouraging jurors to engage in self-referencing when determining whether a reasonable person would have foreseen the risk associated with the defendant’s conduct. When self-referencing, a person keeps his or her own perspective, but puts him or herself in the situation that the other was in. Essentially, a person asks, "How would I feel or react if that happened to me?" Also, if the person had actually experienced the same situation, they could ask, “How did I feel or react when that happened to me?” Some research has considered self-referencing to be a form of empathy (e.g., O’Connor et al., 2004). Further, self-referencing can be cognitive (imagining how oneself would perceive or think) or affective (imagining how oneself would feel). In the context of a trial, attorneys could ask jurors to think about how they would have thought, acted, or felt if they were in the

defendant's place during the time in question. Additionally, there is a possibility that jurors will spontaneously self-reference to one of the parties in a lawsuit. O'Connor et al. (2004) and Wiener and Hurt (2000) have examined the effects of jurors' self-referencing in the context of sexual harassment cases and have found a large relationship between measures of self-referencing and verdicts, such that jurors who self-referenced to the plaintiff's situation were more likely to find the defendant liable for sexual harassment. These researchers maintain that jurors will spontaneously self-reference to resolve questions left unanswered by the evidence in an ambiguous case, subsequently influencing their verdicts and damage awards.

Self-referencing could be applied in a similar manner by the defense in negligence cases. Specifically, the defense attorney could inform jurors of the prejudicial effects of hindsight on their judgments of whether the defendant should have foreseen the consequences of his/her behavior and encourage them to put themselves in the defendant's situation, and consider whether they would have foreseen the risk of harm to the plaintiff. Similarly, a judge could employ the same debiasing strategy in his or her jury instructions. In fact, the State of California civil jury instructions on negligence and liability do suggest that jurors consider the perspective of a "reasonable person" when determining whether the defendant could or should have foreseen the risk of injury to the plaintiff resulting from his/her actions. These instructions state:

One test that is helpful in determining whether or not a person was negligent is to ask and answer whether or not, if a person of ordinary prudence had been in the same situation and possessed of the same knowledge, he would have foreseen or anticipated that someone might have been injured by or as the result of his action

or inaction. If the answer to that question is “yes,” and if the action or inaction reasonably could have been avoided, then not to avoid it would be negligence. BAJI instructions 3.00, 3.10, 3.11, and 3.75 from *California Jury Instructions Civil, Book of Approved Jury Instructions* (1977, as cited in Johnson & Drobny, 1985).

Johnson and Drobny actually provided the full set of California’s instructions to mock jurors in their 1985 experiments exploring the effects of the causal and temporal proximity of a defendant’s allegedly negligent act on legally relevant judgments. The participants in those studies were less likely to find that the defendant had control over the events, could have foreseen the injury suffered by the plaintiff, was negligent, and should be held liable for the plaintiff’s injury when the chain of antecedent events was causally complex. Their findings may indicate that mock jurors believe that they would not have foreseen the risk in the questioned behavior and would not expect to be found negligent or held liable under similar circumstances. Imagining themselves in the defendant’s situation at the time of his/her allegedly negligent decision or action (prior to the occurrence of the outcome) may allow jurors to recognize the possibility of alternative outcomes resulting from the questioned act. Thus, the foreseeability of harm caused by the defendant’s behavior may not seem so obvious and certain, leading jurors to question whether the conduct was in fact negligent.

Chapter V

Experiment One

The first experiment in this research was designed to further examine the moderating role of counterfactual thinking on the hindsight bias, as well as to explore another potential moderator, self-referencing. As Roese and Olson (1996) and Robbennolt and Sobus (1997) found divergent effects of counterfactuals on the hindsight bias, this research sought to determine whether counterfactual thinking in fact increases or decreases the hindsight bias. This study closely followed the methods employed by Roese and Olson in their third experiment. Specifically, I initiated mock jurors' counterfactual thinking with manipulations of the normality/exceptionality of the target antecedent event as well as outcome closeness in addition to the traditional hindsight bias manipulation of outcome information.

Hypotheses

First, I hypothesized that I would replicate the consistent findings in the counterfactual literature that participants would be more likely to counterfactually mutate the target event when that event was exceptional versus normal (see Figure 5) and when the outcome described was nearly avoided versus not nearly avoided. Second, I expected to replicate the consistent finding in the hindsight literature that mock jurors would rate the outcome as more foreseeable and probable and would be more likely to find the defendant's target behavior negligent when they were explicitly aware versus unaware of the outcome of the scenario (see Figures 1 and 3).

The principal hypothesis of Experiment One was that I would replicate the relationship observed by Roese and Olson (1996), in that counterfactual thinking about

the target defendant behavior would increase mock jurors' hindsight bias in the form of foreseeability, probability, and negligence judgments through causal attributions linking that behavior to the plaintiff's damages. This hypothesized relationship is represented in the tested model by the paths from the normality by outcome interaction to causality, foreseeability, probability, and negligence (see Figure 9). I hypothesized the effect found by Roese and Olson and not Robbennolt and Sobus, because participants' counterfactual thinking about the defendant's behavior should increase the explanatory clarity of how exactly that behavior led to the given outcome, which research shows increases people's certainty that the outcome was inevitable (N'gbala & Branscombe, 1995; Roese & Olson, 1996; Wasserman, Lempert, & Hastie, 1991).

Additionally, in accordance with the mediational relationship observed in the literature described above (Branscombe, Crosby, & Weir, 1993; Branscombe & Weir, 1992; Roese & Olson, 1996, 1997; Wells & Gavanski, 1989), I hypothesized that mock jurors' causal judgments would be influenced by their tendencies to generate counterfactual alternatives for the defendant's behavior. This hypothesis is represented by the path from the counterfactual measure to causality (see Figure 9). Spellman and Kincannon (2001) also support this hypothesis, as they note empirical evidence that several of the characteristics of antecedent events known to affect the likelihood of their counterfactual mutation also influence judgments of their causality of the outcome.

Further, I predicted that mock jurors' increased judgments of the causality of the defendant's behavior, influenced by their counterfactual thoughts about that behavior, would subsequently translate into higher ratings of the foreseeability and probability of the outcome as well as a greater likelihood of negligence verdicts (see Figure 9). I

hypothesized that causal attributions about the target defendant behavior would directly and indirectly affect negligence verdicts through both foreseeability and probability ratings, as I expected that increased judgments of the foreseeability and probability of the outcome would also translate into a greater likelihood of mock jurors finding the defendant negligent (see Figures 3 and 9).

Finally, I hypothesized that both exceptional defendant behavior and outcome knowledge would decrease the extent of self-referencing to the defendant that participants reported (see Figure 11). Additionally, I predicted that mock jurors' increased self-referencing to the defendant would decrease their likelihood of counterfactually manipulating the target defendant behavior, their ratings of the causality of that behavior, their judgments of the probability and foreseeability of the outcome, as well as their likelihood of finding the defendant negligent (see Figure 11).

Method

Participants

A total of 668 jury-eligible students from the FIU psychology experiment participant pool completed this experiment through Sona Systems. Though students may not be as representative a sample as jury eligible community members, research has shown that the results of juror simulation studies are not significantly affected by sample type (Bornstein, 1999). The sample was 68% female and 38% male. Eighty percent of the sample was between the ages of 18 and 21, and 15% were between the ages of 22 and 25, with the remaining 6% of the participants aged 26 and over. The sample was 67% Hispanic, 14% Caucasian, 9% African American, 2% Asian, 6% identified themselves as "Other," and 2% preferred not to provide their race/ethnicity. Sixty-one percent of the

sample spoke English as their first language, and 89% described their skill with the English language as “very good” or “excellent.”

Design

Experiment one involved a three (no outcome information versus outcome nearly avoided versus outcome not nearly avoided) by two (defendant’s behavior normal versus exceptional) between subjects factorial design.

Materials and Procedure

After providing informed consent to participate in the study (see Appendix A), mock jurors read a case summary involving a negligence suit (see Appendix B). The materials were adapted from those used by Hastie, Schkade, and Payne (1999), which were based on the fact situation from a 1990 environmental damage accident in which a Southern Pacific train derailed and dumped toxic herbicide into the Sacramento River near Dunsmuir, California. The approximately 1,300 word summary described a chain of events leading up to (and including, in the hindsight conditions) a train derailment off of a steep, sharply curved bridge crossing over the Durango River. Upon its derailment, a train car carrying a hazardous herbicide was punctured by rocks in the river bed, causing the pesticide to leak into the water and leading to severe damage of the nearby Durango River Fish Hatchery. The hatchery was suing the Chicago Western Railroad company for negligence, alleging that its actions were responsible for the (in the hindsight conditions) or could lead to a (in the foresight conditions) train derailment, herbicide spill, and subsequent damage to the fish hatchery and surrounding environment. Two-thirds of the participants were provided with outcome information describing the train derailment and subsequent damage, and one-third were not told whether a train derailment and/or

environmental damage occurred as a result of the events leading up to the train's scheduled journey across the Durango River bridge. Half of those mock jurors provided with outcome information learned that the derailment was nearly avoided, as the train had almost completely made it around the bridge's curve when some of the cars derailed (close outcome). The other half of participants in the hindsight condition did not learn that the derailment was nearly avoided, as they simply read that some of the cars derailed as the train was making its way around the bridge's curved track (normal outcome). This manipulation of outcome closeness was designed to influence counterfactual thinking, such that the nearly avoided derailment should initiate more counterfactual mutations of the defendant's behavior than the not-nearly avoided derailment. Additionally, the exceptionality of the defendant's behavior was manipulated in order to influence mock jurors' propensity to counterfactually manipulate that event. Specifically, participants were told that Chicago Western railroad either had (normal behavior) or had not (exceptional behavior) followed standard protocols for the arrangement of loaded and empty as well as long and short cars on the train in order to avoid the "stringlining" effect that can lead to derailments off of curved tracks such as the one crossing the Durango River.

After reading the case scenario, mock jurors were asked to provide counterfactual thoughts about how the scenario described could have been different (Roese & Olson, 1996). Specifically, participants were told to fill in the blank: "The train derailment and herbicide spill into the river below would not have happened if only:" (hindsight condition) or "Chicago Western and other railroads can avoid train derailments that cause serious harm to the surrounding environment if only:" (foresight condition). On the next

page of the study (see Appendix C), participants rated the extent to which the defendant's actions were causal of the/a potential train derailment on a Likert-type scale from one (*not at all causal*) to five (*completely causal*). The participants were also asked to provide a percentage probability rating that the/a train derailment would have occurred given the defendant's actions (ignoring what they knew about the actual derailment, in the hindsight conditions). Additionally, the mock jurors rated how foreseeable the/a potential train derailment was given the defendant's conduct on a Likert-type scale from one (*not at all foreseeable*) to five (*completely foreseeable*), again, ignoring what they knew about the actual outcome in the case of hindsight participants.

Also, after reading standard jury instructions that described the appropriate burden of proof and provided the legal definition of negligence, mock jurors rendered a verdict, determining whether the defendant was negligent and should be held liable for its actions. In the hindsight condition, participants were told, "The plaintiff, Durango River Fish Hatchery, alleges that the defendant, Chicago Western Railroad, was negligent in its actions with regard to one of its trains, which traveled a dangerous section of track that included a bridge over the Durango River, where the plaintiff's fish hatchery was located, on September 17, 2006. Specifically, the plaintiff claims that Chicago Western negligently and irresponsibly loaded a tank car containing a potentially hazardous herbicide (weed killer) onto this particular train, which traveled the specified section of track over the Durango River and the hatchery on the day in question" and asked, "Do you find from a preponderance of the evidence that Chicago Western Railroad was negligent in its actions on September 17, 2006 with regard to the train that derailed on the specified section of track that evening?" Participants in the foresight condition were told,

“The plaintiff, Durango River Fish Hatchery, alleges that the defendant, Chicago Western Railroad, was negligent in its actions with regard to one of its trains, which was scheduled to travel a dangerous section of track that included a bridge over the Durango River, where the plaintiff's fish hatchery was located, on September 17, 2007. Specifically, the plaintiff claims that Chicago Western negligently and irresponsibly loaded a tank car containing a potentially hazardous herbicide (weed killer) onto this particular train, which was to travel the specified section of track over the Durango River and the hatchery on the day in question” and asked, “ Do you find from a preponderance of the evidence that Chicago Western Railroad was negligent in its actions on September 17, 2007 with regard to the train that was scheduled to travel the specified section of track that evening?”

Finally, in order to explore what influence self-referencing may have on hindsight bias, I collected direct measures of the extent of mock jurors' self-referencing to the defendant as well as measures of their perceived relevance to the defendant (see Appendix C). The three self-report self-referencing measures, which asked how much participants had thought about what they would have thought, felt, and done had they found themselves in the defendant's situation, became the three indicators for a latent self-referencing measure in the tested model (see Figure 11). According to some research (e.g., Jones & Nisbett, 1972; Krebs, 1975; Olsen-Fulero & Fulero, 1997), jurors' perceived situational and personal relevance to the actors involved in a trial will influence whether and to what extent they take the perspective of and self-reference to those actors. Personal relevance is defined as the perceived similarity between the observer and another person, and situational relevance is defined as the probability that "the observer

will find himself someday in similar circumstances" (Chaiken & Darley, 1973, p. 269). Shared demographic variables such as ethnicity and gender can influence the personal and situational relevance jurors feel toward the actors in a trial (Kerr, Hymes, Anderson, & Weathers, 1995).

Results

Preliminary Analyses

Participants' open-ended responses to the counterfactual "...if only..." prompt given at the end of the case summary were coded for whether they mentioned the target defendant behavior manipulated by the normality variable, namely, whether the defendant had (normal) or had not (exceptional) followed standard protocols for the arrangement of loaded and empty as well as long and short cars on the train. A list of the frequencies and percentages of all responses to the counterfactual prompt can be found in Table 1. If a participant's counterfactual statement did not manipulate that target behavior, the response was coded as "0," or "no counterfactual manipulation." If, on the other hand, a participant's response did specifically reference the target behavior, the counterfactual statement was coded as "1," or "counterfactual manipulation."

I coded specifically for manipulation of the target defendant behavior, because the normality variable specifically manipulated that behavior. I could not simply code for the presence of any counterfactual statement, as the prompt directly asked mock jurors to provide a counterfactual manipulation to satisfy the "...if only..." thought. Therefore, all participants necessarily engaged in counterfactual thinking immediately after reading the case summary, but only the effects of those thoughts that manipulated the defendant's key, or target, behavior on participants' judgments about the causality and negligence of

that behavior in the context of a negligence lawsuit were of interest for purposes of testing the hypothesized model. It is likely that mock jurors' counterfactual thoughts about other aspects of the actual/a potential train derailment affected their judgments about the causality and negligence of those events/behaviors, but for the purposes of the current study, I was only interested in participants' judgments related to the defendant's behavior and its contribution to and responsibility for the/a derailment.

This treatment of counterfactuals is common in the literature, and both prior studies examining the relationship between counterfactual thinking and hindsight bias discussed in the literature review used a similar method. Specifically, rather than analyzing the effects of any counterfactual thoughts participants in their research might have had regarding the stimulus scenario, Roese and Olson (1996) also focused on whether participants would have mutated a target antecedent behavior or decision in order to undo the given outcome. Additionally, although Robbennolt and Sobus (1997) did not actually measure participants' counterfactuals, their manipulation of the defendant's antecedent behavior was specifically designed to influence whether mock jurors engaged in counterfactual thinking about the target incident. Further, Wells and Gavanski (1989) did not manipulate the target antecedent event itself, but they manipulated other details of the stimulus scenario in an attempt to specifically affect whether participants counterfactually mutated the target event.

Preliminary analyses also indicated that the manipulation of outcome closeness, which was solely designed to influence counterfactual thinking, did not significantly affect mock jurors' counterfactuals or any other dependent measures. Therefore, to improve the model's parsimony, the "nearly avoided" and "not nearly avoided" outcome

information conditions were collapsed into a single outcome knowledge condition for all analyses. So, the outcome variable included in the tested model only had two conditions: no outcome information versus outcome information provided.

Note that there were additional paths actually tested in the full model that I did not specifically hypothesize. These paths were added to the model as a result of preliminary model fit statistics provided by MPlus, specifically, modification indices indicating that adding these paths would significantly improve model fit. Such paths were added to the originally hypothesized model (as illustrated by the component hypothesized models in Figures 1, 3, 5, 7, 9, and 11) one at a time, in accordance with the modification indices, until I achieved good global and focused model fit.

Finally, as hypothesized, the measures of the foreseeability and probability of a train derailment were significantly positively correlated ($\beta = .31, p < .01$). As these measures were conceptualized as essentially two indicators of the single theoretical construct of hindsight bias, it was appropriate and expected that they were positively correlated with one another. The foreseeability and probability measures were originally included in the model as two indicators of the same latent variable, but this resulted in poor model fit. Good model fit was only achieved when these two measures were included in the model separately. The reason for this becomes clear throughout the results, as the effects involving foreseeability and probability were often completely different from one another. For example, in some instances an effect was significant involving one measure, but the same path involving the other measure was not significant. In other instances, the paths to both measures were significant, but the effects went in opposite directions (one positive, one negative).

Model Fit

The full model comprised of the component models illustrated by Figures 1, 3, 5, 7, 9, and 11 was tested using Structural Equation Modeling with MPlus Version 5.0, using the default probit (mean structure) analysis with the WLSMV estimator and bootstrapping to correct for any non-normality in the data. The model yielded an excellent fit to the data. The overall Chi-Square test of model fit was statistically non-significant ($X^2(10) = 9.09, p = .52$) and the Comparative Fit Index (CFI) was 1.00, both indicating good global model fit. There were no modification indices above the minimum value of 3.84, indicating good focused model fit. The factor loadings for each of the three self-referencing indicators described above (see Appendix C) onto the latent self-referencing variable were relatively high ($\beta = .68, \beta = .80, \beta = .84$), confirming that they were in fact appropriate measures of the latent variable. The significant paths found in the tested model are illustrated by the component models in Figures 2, 4, 6, 8, 10, and 12.

Manipulation Checks

First, the manipulation of the normality of the defendant's behavior had the intended effect on participants' counterfactual thinking (see Figure 6). Specifically, mock jurors were more likely to counterfactually manipulate the target defendant behavior when that behavior was exceptional versus normal (Total effect: $B = 1.28, \beta = .52, p < .01$; $M = .78, M = .34$, respectively).

Second, the manipulation of outcome information had the intended effect on participants' ratings of the foreseeability of a train derailment (see Figure 4). Specifically, participants who were told the outcome, and were thus making judgments in hindsight, thought that a derailment was more foreseeable than participants who were not told the

outcome, and were thus making judgments in foresight (Total: $B = .31$, $\beta = .08$, $p = .04$; $M = 6.48$, $M = 6.14$, respectively). In other words, I observed the traditional hindsight bias in this study, as evidenced by the effect of outcome information on mock jurors' foreseeability ratings. However, outcome information had an unexpected effect on participants' ratings of the probability of a/the train derailment (see Figure 4), such that participants who were aware that the derailment had occurred felt that it was actually less probable than those who were unaware of the derailment (Total: $B = -.49$, $\beta = -.10$, $p < .01$; $M = 54.59\%$, $M = 58.95\%$, respectively).

Effects of Manipulations on Negligence Verdicts

For all tested effects of the manipulations on negligence, see Figure 1; for all significant effects of the manipulations on negligence, see Figure 2. The hindsight bias did not extend to participants' negligence verdicts (Total: $B = -.06$, $\beta = -.02$, $p = .64$). The normality of the defendant's behavior had an effect on negligence verdicts, such that participants were more likely to find the defendant negligent when its behavior was exceptional versus normal (Total: $B = 1.17$, $\beta = .51$, $p < .01$; $M = .91$, $M = .56$, respectively). The effects of the outcome knowledge by behavior normality interaction on negligence verdicts are discussed below.

Foreseeability/Probability as Mediators

For all tested effects involving foreseeability and probability, see Figure 3; for all significant effects involving foreseeability and probability, see Figure 4. The total effects of the outcome manipulation were described above. In addition, mock jurors rated a potential/the actual derailment as more foreseeable (Total: $B = .68$, $\beta = .18$, $p < .01$; $M = 6.69$, $M = 6.00$, respectively) and more probable (Total: $B = .93$, $\beta = .19$, $p < .01$; $M =$

6.06, $M = 5.15$, respectively) when the defendant's behavior was exceptional rather than normal. The effect of the outcome information by behavior normality interaction was not significant on participants' probability ratings (Total: $B = -.07$, $\beta = -.30$, $p = .17$), and the effects of the interaction on mock jurors' foreseeability ratings are discussed below. Also, the more foreseeable (Total: $B = .12$, $\beta = .20$, $p < .01$) and probable (Total: $B = .04$, $\beta = .08$, $p = .04$) participants felt a/the derailment was, the more likely they were to find the defendant negligent.

Counterfactuals as a Mediator

For all tested effects involving counterfactuals, see Figure 5; for all significant effects involving counterfactuals, see Figure 6. As noted above, mock jurors were more likely to counterfactually manipulate the target defendant behavior when that behavior was exceptional versus normal. Also, the total effect of counterfactual thoughts on negligence verdicts was significant ($B = .25$, $\beta = .27$, $p < .01$). I reserve all tests of mediation and indirect effects for the section below describing the effects involving all measured endogenous variables (*Counterfactuals, Causality, & Foreseeability/Probability as Mediators*), but counterfactual thinking was clearly an important mediating variable in the tested model.

In addition, one unexpected effect of the outcome manipulation showed that when participants were aware of the outcome, they were less likely to counterfactually manipulate the target defendant behavior than when they were not given any outcome information (Total: $B = -.58$, $\beta = -.22$, $p < .01$; $M = .50$, $M = .68$, respectively). This effect was qualified by an interaction between outcome information and the behavior normality manipulation, however (Total: $B = .24$, $\beta = .19$, $p < .01$), such that outcome

knowledge only significantly decreased the likelihood that participants would counterfactually manipulate the target defendant behavior when that behavior was normal ($B = -1.74, p < .01$; no outcome knowledge: $M = .57$, outcome knowledge: $M = .19$). Outcome information did not significantly affect mock jurors' propensity for counterfactually thinking about the defendant's behavior when that behavior was exceptional ($B = -.13, p = .64$; $M = .80, M = .78$). Another way to interpret this interaction is that exceptional defendant behavior was associated with more counterfactual mutations of that behavior regardless of outcome knowledge, but the effect of behavior normality was significantly stronger in the hindsight (outcome knowledge) condition (normal: $M = .19$, exceptional: $M = .78$) than in the foresight (no outcome knowledge) condition (normal: $M = .57$, exceptional: $M = .80$).

Counterfactuals & Foreseeability/Probability as Mediators

For all tested effects involving counterfactuals, foreseeability, and probability, see Figure 7; for all significant effects involving counterfactuals, foreseeability, and probability, see Figure 8. Considering Roese and Olson's (1996) finding that counterfactual thinking increased the hindsight bias, I hypothesized that counterfactuals mutating the target defendant behavior would increase participants' ratings of the foreseeability and probability of the outcome. Mock jurors who counterfactually manipulated the target defendant behavior did in fact rate that behavior as more foreseeable (Total: $B = .30, \beta = .20, p < .01$) and more probable (Total: $B = .28, \beta = .14, p = .02$) than those who did not engage in counterfactual thinking about the target behavior.

Counterfactuals, Causality, & Foreseeability/Probability as Mediators

For all tested effects involving counterfactuals, causality, foreseeability, and probability, see Figure 9; for all significant effects involving counterfactuals, causality, foreseeability, and probability, see Figure 10. Following Roese & Olson's (1996) model, I now present the results adding causality as a mediator of the relationship between counterfactuals and the hindsight bias, as measured by mock jurors' foreseeability and probability ratings. First, participants rated the defendant's behavior as more causal of a potential/the actual train derailment when the target behavior was exceptional versus normal (Total: $B = 1.61$, $\beta = .31$, $p < .01$). This effect on causality was partially mediated by participants' counterfactual thoughts about that behavior (Indirect: $B = .58$, $\beta = .11$, $p < .01$; Direct: $B = 1.05$, $\beta = .20$, $p < .01$), as mock jurors who counterfactually manipulated the target defendant behavior rated that behavior as more causal of a potential/the actual train derailment (Total: $B = .45$, $\beta = .21$, $p < .01$). Next, as hypothesized, causality mediated the relationship between counterfactual thinking and foreseeability and probability judgments (Indirect effects: $B = .11$, $\beta = .07$, $p < .01$; $B = .17$, $\beta = .08$, $p < .01$, respectively). Specifically, the more causal participants rated the defendant's behavior, the more foreseeable (Total: $B = .25$, $\beta = .35$, $p < .01$) and probable (Total: $B = .37$, $\beta = .39$, $p < .01$) they found a potential/the actual train derailment. Causal attributions about the defendant's behavior were also strongly related to negligence verdicts, such that the more causal mock jurors found the defendant's behavior, the more likely they were to find the defendant negligent (Total: $B = .23$, $\beta = .52$, $p < .01$).

Finally, as all of the component paths described above were significant, the complete hypothesized indirect path from the normality manipulation to mock jurors'

counterfactual thoughts about the defendant's behavior, to their ratings of the causality of that behavior, to their judgments of the foreseeability of a/the train derailment, and finally to their negligence verdicts was significant ($B = .02, \beta = .01, p < .01$). The similar indirect path from normality to counterfactuals, to causality, to participants' probability ratings, to negligence was marginally significant ($B = .01, \beta = .003, p = .07$).

Moderation of the Hindsight Bias by Counterfactuals

Hindsight Represented by Foreseeability Judgments

The interaction between the normality of the defendant's behavior and participants' knowledge of outcome information interacted to influence foreseeability judgments (Direct: $B = -.16, \beta = -.09, p = .02$; see Figure 4). However, contrary to my hypothesis and the finding of Roese and Olson (1996), exceptional defendant behavior reduced rather than increased the hindsight bias. The traditional hindsight bias was observed when the defendant's behavior was normal, such that participants felt that the train derailment was more foreseeable when they were aware of the outcome than when they were unaware of the outcome ($\beta = .11, p = .057; M = 6.17, M = 5.74$, respectively). However, when the defendant's behavior was exceptional, the hindsight bias was not observed in mock jurors' foreseeability ratings ($\beta = .05, p = .34; M = 6.76, M = 6.57$). This interaction supports the finding of Robbenolt and Sobus (1997) that counterfactual thinking about a given outcome decreases hindsight bias about the likelihood or predictability of that outcome. In fact, these results suggest that the hindsight bias only manifests itself when people do not engage in counterfactual thinking about the given outcome.

It is important to note, however, that there was not a significant total effect of the normality by outcome interaction on participants' foreseeability ratings (Total: $B = -.06$, $\beta = -.23$, $p = .11$). This is because the negative direct effect was offset by three positive indirect effects involving paths through mock jurors' counterfactual thoughts about the defendant's behavior ($B = .02$, $\beta = .02$, $p = .07$; see Figure 8) and their causal attributions about that behavior ($B = .03$, $\beta = .01$, $p < .01$; see Figure 10), as well as their reported extent of self-referencing to the defendant ($B = .02$, $\beta = .02$, $p = .03$; see Figure 12). The indirect path through both counterfactuals and causality also extended to a significant positive indirect effect on participants' negligence verdicts ($B = .02$, $\beta = .01$, $p = .01$; see Figure 10), as did the indirect path involving mock jurors' reported self-referencing to the defendant ($B = .004$, $\beta = .004$, $p = .04$).

Hindsight Represented by Negligence Verdicts

A similar pattern of results emerged on mock jurors' negligence verdicts. The interaction of outcome information and the normality of the defendant's behavior had a marginally significant total effect and a significant direct effect on participants' negligence verdicts (Total: $B = -.08$, $\beta = -.24$, $p = .07$; Direct: $B = -.12$, $\beta = -.10$, $p = .04$; see Figure 2). Outcome information had the predicted hindsight bias effect on negligence verdicts when the defendant's behavior was normal (no information: $M = .54$, outcome information: $M = .58$), but when the target behavior was exceptional, thus eliciting counterfactual thoughts, outcome information actually decreased negligence verdicts (no information: $M = .93$, outcome information: $M = .89$). This pattern of results lends some support to Robbenolt and Sobus's (1997) finding that counterfactual thinking decreases the hindsight bias, as the hindsight effect was only observed on negligence verdicts when

participants were least likely to engage in counterfactual thinking about the defendant's behavior (i.e., when that behavior was normal versus exceptional).

There were also several indirect effects involving the normality by outcome interaction on mock jurors' negligence verdicts. The effect was mediated by participants' foreseeability judgments ($B = -.02, \beta = -.02, p = .04$; see Figure 4) and counterfactuals ($B = .03, \beta = .03, p = .08$; see Figure 6) both individually and together ($B = .01, \beta = .01, p = .07$; see Figure 8). Additionally, the effect of the normality by outcome interaction on negligence verdicts was mediated by the path from counterfactuals to causality ratings ($B = .02, \beta = .02, p = .01$; see Figure 10), the path from counterfactuals to causality to foreseeability ($B = .003, \beta = .003, p = .01$; see Figure 10), and the similar path from counterfactuals to causality to probability ratings ($B = .002, \beta = .001, p = .09$; see Figure 10).

Effects Involving Self-Referencing

I have not yet mentioned the significant effects involving self-referencing, because the main purpose of Experiment One was to explore the relationship between counterfactual thinking and the hindsight bias. However, there were several notable effects of the self-report self-referencing measure in this study that shaped the designs of Experiments Two and Three. For all tested effects involving self-referencing, see Figure 11; for all significant effects involving self-referencing, see Figure 12. First, the latent self-referencing variable was affected by marginally significant negative effects of the normality and (combined) outcome manipulations. Mock jurors reported engaging in less self-referencing to the defendant when the target behavior was exceptional versus normal (Total: $B = -.22, \beta = -.07, p = .10$; Direct: $B = -.22, \beta = -.07, p = .10$) and when they were

aware versus unaware of the outcome (Total: $B = -.26$, $\beta = -.09$, $p = .06$; Direct: $B = -.26$, $\beta = -.09$, $p = .06$). These effects were qualified, however, by a significant interaction between the normality and outcome manipulations on participants' reported self-referencing (Total: $B = .16$, $\beta = .11$, $p < .01$; Direct: $B = .16$, $\beta = .11$, $p < .01$). The effect of the behavior normality manipulation was significant when participants were unaware of the outcome ($\beta = -.22$, $p < .01$) but not when they were aware of the outcome ($\beta = -.01$, $p = .90$).

Second, the more participants reported engaging in self-referencing, the more probable (Total: $B = .18$, $\beta = .11$, $p = .02$; Direct: $B = .16$, $\beta = .10$, $p = .03$) and foreseeable (Total: $B = .22$, $\beta = .17$, $p < .01$; Direct: $B = .21$, $\beta = .17$, $p < .01$) they found a/the train derailment. Third, there was a positive indirect effect of participants' reported self-referencing on their negligence verdicts through their judgments of the foreseeability of a/the derailment ($B = .03$, $\beta = .03$, $p < .01$). Specifically, the more self-referencing mock jurors reported engaging in, the more foreseeable they felt a/the train derailment was, and, subsequently, the more likely they were to find the defendant negligent. The direct effect of participants' self-referencing on negligence was marginally significant but negative, such that the more they reported engaging in self-referencing to the defendant, the less likely they were to find the defendant negligent ($B = -.06$, $\beta = -.08$, $p = .07$). Due to the conflicting direct and indirect effects, the total effect of self-referencing on negligence verdicts was non-significant.

Discussion

In Experiment One, I replicated the consistent finding in the counterfactual literature that exceptional behavior leads to significantly more counterfactual thoughts

about that behavior than normal behavior (see Figure 6). Additionally, outcome information had the expected hindsight effect on mock jurors' judgments of the foreseeability of the outcome, but not on their ratings of the probability of the outcome or their negligence verdicts (see Figure 4). Outcome knowledge actually had the opposite of the hypothesized effect on probability ratings, such that participants who were aware that a train derailment had occurred actually rated the probability of a derailment lower than those who were unaware of the derailment. While I am generally at a loss to explain this unexpected effect, there is a possibility that the particular fact pattern of the case scenario I used in this study affected mock jurors' probability ratings in an atypical manner. Specifically, participants in the hindsight condition who learned of the details of the train derailment read about a relatively unlikely sequence of events that led not only to a derailment but specifically to the derailment and eventual herbicide spill into the river below the bridge. Conversely, participants in the foresight condition read about the possibility of a derailment, but did not learn of the specific (and relatively lengthy, unlikely) sequence of events that would have to occur in order for the train to derail off of the bridge, into the river, and for the train car containing poisonous herbicide to rupture, spilling the herbicide into the river. Thus, in light of the chain of events the hindsight participants were considering when making their judgments of the probability of a train derailment, the fact that they found a derailment less probable than the foresight participants who were only considering the vague possibility of a derailment becomes more explicable. As will be seen below, this explanation for the unexpected effect of outcome knowledge on probability ratings received some support from the results of Experiment Three. Specifically, the longer the sequence of events from the initiating

event to the outcome that mock jurors read about in the third study, the less foreseeable they found the eventual outcome (a flood). This effect did not hold for probability ratings, however, so empirical support for my speculative explanation regarding the negative effect of outcome knowledge on probability ratings is minimal.

Another potential explanation for the negative effect of outcome knowledge on mock jurors' probability ratings is that it may be an artifact of slight differences in the wording of statements about the probability of a train derailment and herbicide spill into the river in the hindsight and foresight case scenarios. Namely, participants in the no outcome knowledge condition read that an expert had testified that a derailment and subsequent herbicide spill was "highly unlikely," whereas mock jurors in the outcome knowledge condition read that an expert had testified that a derailment and herbicide spill was "truly an improbable event." It is possible that the hindsight participants asked to rate the probability of a derailment/spill were led to provide lower ratings after reading that it was truly improbable, versus the foresight participants who simply read that it was highly unlikely. While I doubt that this subtle variation in wording was enough to cause a significant effect on mock jurors' probability ratings, it is the only other difference in the scenarios of the two outcome knowledge conditions specifically relevant to probability judgments.

My principal hypothesis regarding the moderation of the hindsight bias on participants' foreseeability and negligence judgments by their counterfactual thoughts about the target defendant behavior was not supported. The normality by outcome interaction did not have a significant total effect on mock jurors' foreseeability or negligence judgments, and although the interaction did have significant direct effects on

both foreseeability and negligence, the effects were not in the hypothesized direction (see Figures 2 and 4). Specifically, the hindsight bias was only observed in this study when the target defendant behavior was normal rather than exceptional. Thus, although I expected to replicate Roese and Olson's (1996) finding that characteristics of a scenario that encourage counterfactual thinking, such as antecedent behavior normality, exacerbate the hindsight bias, the results of Experiment One lend some support to Robbenolt and Sobus's (1997) finding that such characteristics decrease the hindsight bias.

My hypothesis that counterfactual thinking about the target defendant behavior would increase participants' attributions of the causality of that behavior in the outcome was confirmed (see Figure 10). In addition, my hypotheses regarding the positive relationships between mock jurors' causal attributions and their foreseeability, probability, and negligence judgments were also confirmed (see Figure 10), as were my predictions about the positive effects of foreseeability and probability ratings on negligence verdicts (see Figure 4). These expected positive relationships indicate that mock jurors in this research did consider the legally relevant factors of proximate cause and foreseeability when determining the negligence of the defendant's behavior.

Finally, although the behavior normality and outcome information manipulations both had the hypothesized negative effects on participants' reported self-referencing to the defendant, more self-referencing unexpectedly increased mock jurors' foreseeability and probability ratings, and it only marginally directly decreased their likelihood of finding the defendant negligent (the total effect was non-significant; see Figure 12). Therefore, the results of Experiment One suggest that self-referencing is not an effective

debiasing technique, as hypothesized. However, these effects only involve a self-report measure of self-referencing, not a manipulation. Experiments Two and Three incorporate a manipulation of instructions to self-reference to the defendant in order to further explore the potential debiasing effects of self-referencing on mock jurors' legally relevant judgments of the foreseeability and probability of a given outcome as well as on their negligence verdicts.

Chapter VI

Experiment Two

As my hypothesis about the moderation of the hindsight bias by counterfactual thinking was not supported in Experiment One, Experiment Two was designed to further explore this relationship. Another purpose of Experiment Two, due to the unexpected and inconclusive effects of the self-referencing measure in Experiment One, was to experimentally test the moderating effect of self-referencing on the hindsight bias as well as self-referencing's independent effect(s) on the legally relevant judgments in the model.

Hypotheses

My hypotheses for Experiment One remained the same for Experiment Two regarding all variables in the tested model, with the addition of hypotheses for the effects of the new self-referencing manipulation (see the component tested models for Experiment Two in Figures 13, 15, 17, 19, 21, 23, and 24). As described in Chapter IV, I predicted that encouraging jurors to self-reference, or essentially to become more empathetic, to the defendant would prove to be a moderately successful hindsight debiasing technique. In this second study, I directly manipulated mock jurors' self-referencing by including explicit instructions to self-reference to the defendant when making judgments about the case. One-third of the participants received these self-referencing instructions prior to reading the case scenario, one-third received the instructions immediately after reading the case scenario, and the final third did not receive any self-referencing instructions.

First, I hypothesized that mock jurors who received self-referencing instructions would report self-referencing to the defendant to a greater extent than those who did not

receive such instructions (see Figure 23). Second, I predicted that self-referencing instructions would have the same negative effects on all of the endogenous variables in the model (counterfactuals, causality, foreseeability, probability, and negligence) hypothesized for the self-report self-referencing measure (see Figure 23).

Additionally, I hypothesized an interaction between self-referencing instructions and outcome knowledge (see Figure 24), such that among those not provided with outcome information the self-referencing instructions would not affect mock jurors' counterfactual thoughts, judgments of the foreseeability or probability of the outcome, or negligence verdicts.. However, among jurors provided with outcome information, the traditionally observed hindsight bias, measured by foreseeability, probability, and negligence judgments, would be reduced when mock jurors received instructions to self-reference to the defendant. I also expected self-referencing to moderate, specifically to increase, the effect of the behavior normality manipulation on participants' counterfactual thoughts, judgments of foreseeability and probability, and negligence verdicts (see Figure 24). In other words, I hypothesized that the differences in these thoughts/judgments between mock jurors in the normal versus exceptional defendant behavior conditions would be even greater among those participants asked to self-reference to the defendant.

Method

Participants

A total of 474 jury-eligible students from the FIU psychology experiment participant pool completed this experiment through Sona Systems. The sample was 66% female and 34% male. Seventy-seven percent of the sample was between the ages of 18 and 21, and 17% were between the ages of 22 and 25, with the remaining 7% of the

participants aged 26 and over. The sample was 68% Hispanic, 14% Caucasian, 10% African American, 2% Asian, 4% described themselves as “Other,” and 2% preferred not to provide their race/ethnicity. Sixty-one percent of the sample spoke English as their first language, and 90% described their skill with the English language as “very good” or “excellent.”

Design

This study followed a two (outcome versus no outcome information) by two (defendant’s antecedent conduct normal versus exceptional) by three (no self-referencing instructions versus instructions before or after the case summary) between subjects factorial design.

Materials and Procedure

The materials and procedure used in this experiment were identical to those used in the first study with three exceptions (see Appendix F). First, the outcome closeness manipulation was dropped, so the outcome variable had only two levels: outcome information provided versus not provided, and counterfactual thinking was only manipulated through antecedent exceptionality.

Second, the manipulation of self-referencing instructions was added to the scenario in an attempt to increase mock jurors’ self-referencing to the defendant. Specifically, participants were instructed, “As you read the following summary/As you are answering the questions that follow on this page and the next page, try to put yourself in the shoes of the defendant, Chicago Western Railroad. Specifically, think about what you would have thought, felt, or done had you found yourself in the same or similar situation as that described below/above. Putting yourself in Chicago Western's shoes,

take into account your own reactions (i.e., thoughts, feelings, and what you would have done in this situation) when providing your opinions and making judgments about the case.” The dependent measures gauging the extent of participants’ self-referencing to the defendant served as a manipulation check for the instructions manipulation and also allowed for analyses examining the hypothesized effects of self-referencing on the dependent measures of foreseeability, probability, causality, and negligence.

Third, the normality of the defendant’s target behavior was manipulated with a different fact regarding the appropriate make-up of trains. Specifically, participants in the normal behavior condition read, “The train was made up of four locomotives and 97 freight cars. Of the 97 freight cars, 86 were empty and 11 were loaded. It was normal for a train to be made up of so many empty freight cars, and similarly long and largely empty Chicago Western trains had made many trips over this section of track in the past, so this scheduled trip was no exception to the norm.” Participants in the exceptional behavior condition read, “The train was made up of four locomotives and 97 freight cars. Of the 97 freight cars, 86 were empty and 11 were loaded. It was not normal for a train to be made up of so many empty freight cars, and similarly long and largely empty Chicago Western trains had not made many trips over this section of track in the past, so this scheduled trip was an exception to the norm.” I modified this manipulation, because the results of study one indicated that the original defendant behavior normality manipulation was so compelling that it significantly affected all of the dependent variables in the model (causality, foreseeability, probability, and negligence) independently of its intended effect through counterfactual thoughts. I hoped that the new normality manipulation would only influence mock jurors’ counterfactual thinking about the defendant’s behavior and not

introduce an additional, independent factor that would also affect participants' judgments about the case as the original manipulation had done in the first study.

Results

Preliminary Analyses

First, preliminary analyses indicated that there was no difference in effects involving self-referencing instructions given at the beginning versus at the end of the case summary, so the “before” and “after” conditions of this variable were collapsed into a single “self-referencing instructions given” condition for all analyses. Next, for the Experiment Two analyses, I began with the full tested model from Experiment One, including the non-hypothesized paths added based on the MPlus modification indices to reach good model fit, and added the hypothesized paths for the self-referencing manipulation as well as the interactions between self-referencing instructions and the normality and outcome manipulations. With these additions, the same model that achieved good model fit with the data from Experiment One data also achieved excellent model fit with the Experiment Two data on the first analysis. Thus, no adjustments were made to the tested paths in Experiment Two based on modification indices or any other model fit criteria.

Model Fit

The full model comprised of the component models illustrated by Figures 13, 15, 17, 19, 21, 23, and 24 was tested using Structural Equation Modeling with MPlus Version 5.0, using the default probit (mean structure) analysis with the WLSMV estimator and bootstrapping to correct for any non-normality in the data. The model yielded an excellent fit to the data. The overall Chi-Square test of model fit was statistically non-

significant ($X^2(28) = 40.74, p = .06$), the Comparative Fit Index (CFI) was 0.99, the Root Mean Square Error of Approximation (RMSEA) was 0.03, the p-value for the test of close fit was non-significant at .94, and the Standardized Root Mean Square Residual (SRMR) was 0.03, all indicating good global model fit. There were no modification indices above the minimum value of 3.84, indicating good focused model fit. The factor loadings for each of the three self-referencing indicators onto the latent self-referencing variable were relatively high ($\beta = .60, \beta = .76, \beta = .83$), confirming that they were in fact appropriate measures of the latent variable. The significant paths found in the tested model are illustrated by the component models in Figures 14, 16, 18, 20, 22, and 25.

Manipulation Checks

First, the manipulation of the normality of the defendant's target antecedent behavior had the predicted effect on participants' counterfactual thinking (see Figure 18), such that they were more likely to manipulate the target defendant behavior when that behavior was exceptional versus normal (Total: $B = .63, \beta = .30, p < .01; M = .36, M = .16$, respectively). A list of the frequencies and percentages of all responses to the counterfactual prompt can be found in Table 2. Second, the manipulation of outcome information did not have the intended effect on participants' ratings of the foreseeability or probability of a train derailment in the second experiment (see Figure 16). In other words, I did not observe the traditional hindsight bias in this study. Third, the self-referencing manipulation was successful, in that it had the intended effect on the latent measure, such that participants who were given self-referencing instructions reported engaging in significantly more self-referencing to the defendant than those who were not given such instructions (Total: $B = .55, \beta = .21, p < .01; M = 6.44, M = 5.77$,

respectively). Finally, as with Experiment One and as hypothesized, the measures of the foreseeability and probability of a train derailment were significantly positively correlated ($\beta = .43, p < .01$).

Effects of Manipulations on Negligence Verdicts

For all tested effects of the manipulations on negligence, see Figure 13; for all significant effects of the manipulations on negligence, see Figure 14. Although I did not observe the traditional expression of hindsight bias in Experiment Two, as reflected by participants' judgments of the foreseeability and/or probability of the outcome, my results did suggest a form of hindsight bias as reflected in mock jurors' negligence verdicts. Participants were significantly more likely to find the defendant negligent when they were aware of the train derailment than when they were not told that the train actually derailed (Total: $B = .41, \beta = .20, p < .01$; $M = .83, M = .71$, respectively).

Foreseeability/Probability as Mediators

For all tested effects involving foreseeability and probability, see Figure 15; for all significant effects involving foreseeability and probability, see Figure 16. First, outcome knowledge did not significantly affect participants' foreseeability judgments, and it had the opposite of the expected effect on their probability ratings. Specifically, participants who were given outcome information, and were thus making judgments in hindsight, actually thought that a train derailment was less probable than participants who were not given outcome information, and were thus making judgments in foresight (Total: $B = -.83, \beta = -.17, p < .01$; $M = 5.01, M = 5.82$, respectively). Second, as predicted and as prescribed by the law, the more foreseeable mock jurors felt that a/the

derailment was, the more likely they were to find the defendant negligent (Total: $B = .12$, $\beta = .22$, $p < .01$).

Counterfactuals as a Mediator

Normality was the only manipulation that significantly affected participants' counterfactual thoughts (see Figure 18). Contrary to my hypotheses, mock jurors' counterfactual mutations of the target defendant behavior did not affect any of the other endogenous variables in the model.

Counterfactuals & Foreseeability/Probability as Mediators

Mock jurors' counterfactuals did not significantly affect their ratings of the foreseeability or probability of a/the train derailment in the second study (see Figures 19 and 20).

Counterfactuals, Causality, & Foreseeability/Probability as Mediators

For all tested effects involving counterfactuals, causality, foreseeability, and probability, see Figure 21; for all significant effects involving counterfactuals, causality, foreseeability, and probability, see Figure 22. First, as hypothesized and as found in study one, the more causal participants rated the defendant's behavior, the more foreseeable (Total: $B = .27$, $\beta = .34$, $p < .01$) and probable (Total: $B = .35$, $\beta = .34$, $p < .01$) they found a potential/the actual train derailment. Second, as predicted by the model in Figure 21 and as prescribed by law, there was a significant positive effect of participants' causal attributions about the defendant's behavior on their negligence verdicts (Total: $B = .22$, $\beta = .50$, $p < .01$), which was partially mediated by their foreseeability judgments (Indirect: $B = .03$, $\beta = .08$, $p < .01$). The more causal of a/the train derailment mock jurors felt the defendant's behavior was, the more likely they were to find the defendant negligent.

Effects Involving Self-Referencing

For all tested effects involving self-referencing, see Figures 23 and 24; for all significant effects involving self-referencing, see Figure 25. First, the latent self-referencing measure was negatively affected by the outcome information manipulation, as in study one. Mock jurors reported engaging in less self-referencing to the defendant when they were aware of the outcome than when they were not given outcome information (Total: $B = -.27$, $\beta = -.11$, $p = .03$; $M = 6.06$, $M = 6.40$, respectively).

As hypothesized, self-referencing instructions decreased participants' judgments of the foreseeability of a/the train derailment (Total: $B = -.49$, $\beta = -.12$, $p = .01$; $M = 6.52$, $M = 6.04$). Additionally, the results suggested that mock jurors' self-referencing affected their negligence verdicts in the predicted direction. Self-referencing instructions had a total effect on negligence verdicts, such that participants who received the instructions were less likely to find the defendant negligent than those who did not receive the instructions (Total: $B = -.39$, $\beta = -.39$, $p = .01$; $M = .74$, $M = .84$, respectively). The direct effect of self-referencing instructions on negligence verdicts was not significant. Furthermore, the latent self-referencing measure had a negative effect on negligence verdicts. The more participants reported actually self-referencing to the defendant, the less likely they were to find the defendant negligent (Total: $B = -.12$, $\beta = -.15$, $p < .05$). The combination of effects of self-referencing instructions and mock jurors' reported self-referencing on their foreseeability and negligence judgments suggests that although self-referencing may not be an effective hindsight debiasing technique per se, it may prove useful in reducing the likelihood of negligence verdicts.

Finally, my hypotheses concerning the interactions between self-referencing instructions and both outcome knowledge and defendant behavior normality on mock jurors' counterfactual thoughts and foreseeability, probability, and negligence judgments were not supported. None of the tested interactions involving self-referencing instructions were significant.

Discussion

There were fewer significant effects in Experiment Two than in Experiment One. As the materials and procedure were almost identical between the two studies, this could be due to the smaller sample size in Experiment Two (474 versus 668 in Experiment One). The new normality manipulation also clearly contributed to the decrease in significant effects in the second study, as behavior normality only affected counterfactuals in Experiment Two (as intended), whereas it had six significant effects on the endogenous variables in Experiment One. Also likely due to the change in the normality manipulation, participants in the second study were much less likely to counterfactually mutate the target defendant behavior (Experiment One: 57%, Experiment Two: 25.2%). I purposefully changed the exceptional defendant behavior from something that was likely perceived as highly causal of a/the train derailment and almost obviously negligent in the first study, failing to abide by the established industry protocols for the arrangement of loaded/empty and long/short train cars to avoid the “stringlining” effect that causes derailments, to a behavior that was less salient and probably perceived as less causal and flagrantly noncompliant/negligent in the second study, travelling with an unusually large number of empty train cars. Thus, the decrease in counterfactual thoughts about the target defendant behavior from Experiments One to

Two may have been an inadvertent side effect of my intentional shift in the quality of that behavior itself.

First, as intended, the new defendant behavior normality manipulation used in this study only affected participants' counterfactuals, in the expected direction (see Figure 18). Second, outcome knowledge had the predicted hindsight effect on mock jurors' negligence verdicts (see Figure 14), but not on their judgments of the foreseeability or probability of the outcome (see Figure 16). In fact, outcome information had the same unexpected negative effect on participants' probability ratings in this study as in Experiment One. Again, although not a very compelling explanation, the same possibility exists in this study as in Experiment One that the slight difference in wording of an expert's statement about the probability of a train derailment and herbicide spill between the foresight ("highly unlikely") and hindsight ("truly an improbable event") case scenarios led to this unanticipated relationship between outcome knowledge and probability ratings. Finally, also unexpectedly, my hypotheses regarding the moderation of the hindsight (outcome knowledge) effect on mock jurors' foreseeability, probability, and negligence judgments by the normality manipulation were not supported in Experiment Two (see Figures 14 and 16).

My hypothesis that mock jurors who counterfactually mutated the target defendant behavior would rate that behavior as more causal of the outcome than those who mutated another antecedent event was not supported in the second study as it was in Experiment One (see Figure 22). In fact, although counterfactuals affected all of the other endogenous variables in the first study (see Figure 10), they did not significantly influence any of the endogenous variables in Experiment Two (see Figure 22). The

effects of participants' causal attributions about the defendant's behavior were consistent with my hypotheses and the results of Experiment One, however, in that as mock jurors found the defendant's behavior more causal of the outcome, they also found the outcome more foreseeable and probable and were more likely to find the defendant negligent (see Figure 22). The predicted mediation of the relationship between causality and negligence by foreseeability and probability ratings was only supported with foreseeability, as foreseeability, but not probability, positively affected negligence verdicts as hypothesized (see Figure 16).

Finally, the self-referencing instructions were an effective manipulation, as they did increase participants' reported self-referencing to the defendant (see Figure 25). Additionally, as hypothesized and found in Experiment One, participants who were aware of the outcome reported engaging in less self-referencing than those who were unaware of the outcome (see Figure 25). Also as found in the first study and as hypothesized, participants who received self-referencing instructions and/or who reported more self-referencing to the defendant were less likely to find the defendant negligent (see Figure 25). Self-referencing instructions also had the predicted negative effect on foreseeability judgments in this study, as opposed to the unexpected positive effect found in Experiment One (see Figure 25). Although the results of Experiment Two did not support my hypothesis about self-referencing's moderation, specifically debiasing, of the hindsight bias, they do suggest that self-referencing instructions may be an effective technique in reducing mock jurors' judgments of the foreseeability of the plaintiff's outcome (and therefore one criteria for finding the defendant negligent) as well as in directly decreasing the likelihood of negligence verdicts. Due to the conflicting effects of

self-referencing found in Experiments One and Two, however, I continued to examine self-referencing both as a general and specifically hindsight debiasing technique with the same instructions manipulation in Experiment Three.

Chapter VII

Experiment Three

Experiment Three was designed to examine the interactive effects of hindsight (outcome knowledge) and the causal proximity of an initiating event to the outcome on mock jurors' counterfactual mutations of the initiating event and judgments of the causality, foreseeability/probability, and negligence of the initiating event. Specifically, the purpose of this study was to determine whether the presence or absence of outcome information affects these thoughts/judgments for causal sequences of varying lengths. Additionally, as in Experiment Two, the third experiment employed an instruction manipulation to examine self-referencing as a potential moderator of the hindsight bias and as a foreseeability/probability and negligence debiasing technique.

Hypotheses

The tested model in Experiment Three was the same as that tested in Experiment Two, only with causal proximity (number of intermediate events between the initiating event and the outcome) replacing defendant behavior normality as the manipulation of participants' counterfactual thoughts (see the component tested models for Experiment Three in Figures 26, 28, 30, 32, 34, 36, and 37). As the models tested in Experiments Two and Three were the same, my hypotheses for the third study were identical to those for Experiment Two, with the exception of those involving the new causal proximity manipulation, which are described below. These differences are not theoretical in nature, however, and are simply an artifact of the manner in which I coded the behavior normality and causal proximity manipulations. Essentially, the behavior normality manipulation in Experiments One and Two was expected to have a positive effect on

mock jurors' counterfactuals about the target defendant behavior, as exceptional behavior was expected to invoke more counterfactuals than normal behavior. Conversely, the causal proximity manipulation in Experiment Three was expected to have a negative effect on participants' counterfactuals about the target event, as counterfactuals about the event were hypothesized to decrease as the number of intermediate events between that initiating event and the outcome increased. Regardless of the direction of the effects of the manipulations on participants' counterfactuals, however, the predicted relationships between counterfactuals and the other endogenous variables in the model (causal attributions, foreseeability and probability judgments, and negligence verdicts) remain consistent across the three experiments.

Based on the findings of Roese and Olson (1996) and Johnson and Drobny (1985), I predicted that the causal proximity of the antecedent-outcome chain would affect the likelihood that mock jurors would counterfactually mutate the initiating event more often than the other mediating events to undo the given outcome (see Figure 30). In particular, I hypothesized that the traditionally observed causal primacy effect (the first causal event in a sequence is the one most often mutated to undo the outcome) would not hold as the number/complexity of intermediate events increased and, subsequently, causal proximity decreased. To test these propositions, I manipulated the number/complexity of events occurring in a causal sequence between the initiating event (a City's decision regarding employment of a drawbridge operator) and the outcome (a flood) as did Johnson and Drobny. Based on their findings, I predicted that as more intermediate events occurred between the first event and the negative outcome, the causal proximity/connection between the initial event and outcome would become less clear to

participants. As a result, I hypothesized that the typically robust causal primacy effect would be less strong, even eliminated, as the number of intermediate events increased. Specifically, with an increasing number of intermediate events, mock jurors would become less prone to spontaneously generate counterfactuals for the first event in the sequence (see Figure 30). Then, if the initiating event was no longer most often mutated to undo the unfortunate outcome, then it would no longer be perceived as the most causal event of the outcome (see Figure 34). Rather, if another, perhaps intermediate, event was most often altered with counterfactual conditionals, then that event would be perceived as most causal of the outcome. In other words, when applying the but-for rule described above to determine whether the City's initiating decision was a cause in fact of the flood and subsequent damage, an increase in the number of intermediate events would reduce the likelihood that mock jurors would conclude that but for the initiating event, the outcome would not have occurred. Instead, mock jurors would deduce that the intermediate event for which they generated a counterfactual conditional was the most causal of the outcome. Therefore, they may conclude that this critical intermediate event would have caused the outcome anyway, regardless of the initiating event. According to the but-for rule then, in this case jurors must decide that the defendant's behavior was not a cause in fact of the plaintiff's damages.

In addition to its influence on participants' counterfactual mutations of the initiating event, the length and complexity of an outcome's causal chain should also affect their perceptions of the foreseeability and probability of that outcome (see Figure 28). Johnson and Drobny (1985) found evidence that causal proximity, or the causal "closeness" of a defendant's action to the plaintiff's outcome was significantly related to

mock jurors' perceptions of the foreseeability of the outcome as well as other legal judgments, such as negligence and liability. Brickman et al. (1975) also demonstrated that long, complicated causal chains were sometimes associated with ratings of less foreseeability and responsibility of the original antecedent event than shorter, more simple and direct chains.

Further, I hypothesized that participants' outcome knowledge would interact with the number/complexity of intermediate events to affect their likelihood of counterfactually mutating the initiating event, their ratings of the causality of the event, their judgments of the foreseeability and probability of the outcome, and their likelihood of finding the City negligent (see Figure 34). Specifically, I predicted that participants who were aware of the outcome would be more likely to generate counterfactuals for the initiating event, rate the event as more causal of the outcome, judge the outcome as more foreseeable and more probable, and find the City negligent regardless of how many events occurred between the initial event and the outcome. In other words, I expected to always observe the causal primacy effect among those participants provided with outcome information. I predicted that the hindsight bias resulting from outcome knowledge would override the effect of the number of intermediate events, because hindsight bias inherently establishes a causal connection between the initiating event and the outcome without the need for causal proximity. Thus, in order to undo the known outcome, participants would likely mutate what they perceived to be the highly causal and negligent initiating event more than any other event in the causal sequence. Conversely, I predicted that the causal primacy effect would only emerge when there were relatively few intermediate events between the initiating event and the outcome

among those participants not provided with outcome information. In other words, I hypothesized that as the number of intermediate events increased, the likelihood that participants would counterfactually mutate the initial event would decrease in favor of mutations of the subsequent intermediate events. This hypothesis was based on the notion that without a hindsight bias to establish a causal connection between the initial event and the outcome, participants would rely on the relative causal primacy of the antecedent events to determine which event to most effectively mutate to undo the outcome and subsequently, which event was most causal of the outcome. Concomitantly, I expected participants' explicit judgments about the causal role of the initiating event in the outcome as well as their judgments of the foreseeability and probability of the outcome and negligence of the initiating event to follow this same interactive pattern.

Finally, I hypothesized that the self-referencing instructions would interact with the other two manipulations to affect participants' thoughts and judgments about the case (see Figure 37). Specifically, I predicted that the self-referencing instructions manipulation would not affect participants' counterfactuals, ratings of the foreseeability or probability of the outcome, or negligence verdicts among those not provided with outcome information. However, among participants provided with outcome information, the traditionally observed hindsight bias, measured by foreseeability, probability, and negligence judgments, would be reduced when participants were instructed to self-reference to the City Chairperson. In other words, the more self-referencing mock jurors provided with outcome information did, the less foreseeable and probable they would find the outcome and the less likely they would be to find the City negligent. I also expected self-referencing to moderate, specifically to increase, the effect of the number of

intermediate events (i.e., causal proximity) on counterfactuals as well as judgments of foreseeability, probability, and negligence (see Figure 37). When the participants were instructed to self-reference to the City Chairperson, I predicted that those in the longer causal chain condition(s) would find the outcome even less foreseeable and probable and would be even less likely to find the City negligent, regardless of outcome information.

Method

Participants

A total of 224 jury-eligible students from the FIU psychology experiment participant pool completed this experiment through Sona Systems. The sample was 75% female and 25% male. The participants ranged in age from 18 to 50, the mean age was 23 years old, and the median age was 21 years old. The sample was 77% Hispanic, 12% Caucasian, 5% African American, 1% Asian, 3% described themselves as “Other,” and 2% preferred not to provide their race/ethnicity. Fifty-nine percent of the sample spoke English as their first language, and 89% described their skill with the English language as “very good” or “excellent.”

Design

The third experiment followed a two (outcome versus no outcome information) by three (one, three, or five intermediate events) by two (no instructions versus self-referencing instructions) between subjects factorial design.

Materials and Procedure

The procedure followed in this study was very similar to that of the first and second experiments, but I used a new set of case materials (see Appendix G). The case summary for Experiment Three was a slightly modified version of the transcripts of the civil trial simulations used by Kamin and Rachlinski (1995). The 5,740-5,971 word hindsight version of the materials involved a city being sued by a local bakery that had been severely damaged by flooding of a nearby river that was caused by the construction of a new drawbridge over the river. The bakery alleged that the city council's decision not to employ a bridge watchman during the winter and spring months, when the river was usually frozen, was negligent. This contested decision was the target defendant behavior in both the hindsight and foresight conditions of study three. The plaintiffs presented evidence that flooding and subsequent damage to the bakery and surrounding areas was a foreseeable event due to the probability of early spring thawing causing ice and/or debris to lodge under the bridge, forming a dam and leading to flooding of the river upstream. Had the city employed a bridge watchman, the plaintiffs argued, the drawbridge could have been raised in a matter of minutes after thawing began, preventing any backlog of ice or debris under the bridge and, subsequently, preventing the river from flooding upstream. Mock jurors in this condition were asked to determine whether the events leading up to the flood were probable or foreseeable enough to warrant the

expense of employing a full-time bridge watchman. If so, participants were instructed to find the city negligent. If, however, mock jurors determined that the likelihood of such flooding was so small that the expense of a watchman was not warranted, they were instructed to find the city not negligent.

In the 4,621-4,843 word foresight condition, the case involved the same issues and included the same evidence, but in the context of the city council trying to decide whether or not to hire a bridge watchman for the winter and spring months in foresight, before any actual flooding had occurred. Again, this critical decision served as the target defendant behavior for purposes of data analysis. The participants played the role of council committee members who were asked to settle the dispute among an evenly divided council. Again, if they determined that flooding as a result of the new bridge was foreseeable/probable enough to warrant the expense, participants were told that they should vote for the city council to hire a full-time bridge watchman for the winter and spring months. On the other hand, if participants determined that the probability of such a flood was low enough or that such an event was not foreseeable enough to warrant the expense of a full-time bridge watchman, they were instructed to vote that the council should not hire a watchman for the winter and spring months.

Counterfactual thinking was manipulated in this study through the varying lengths of the causal chain of (possible) antecedent events described in the case summary rather than through the manipulation of defendant behavior normality as in the first two studies. To collect a measure of participants' counterfactual thoughts about the target defendant behavior, mock jurors in the hindsight condition were asked to fill in the blank, "The flood described above could have been prevented if only: _____." Participants in the

foresight condition filled in the blank, “Floods such as the potential one described above can be prevented if only: _____.”

The additional dependent measures collected in Experiment Three (see Appendix H) were almost identical to those used in studies one and two, with the exception of the events and parties’ names being modified to reflect the new case materials. Participants in the hindsight condition read standard jury instructions describing the appropriate burden of proof as well as the legal definition of negligence, and were asked, “Do you find from a preponderance of the evidence that the City of Duluth was negligent when it decided not to employ a bridge operator during the winter?” with response choices of either, “No, the City of Duluth was not negligent.” or “Yes, the City of Duluth was negligent.” Participants in the foresight condition did not read any jury instructions, as they were simply prompted with the statement, “I find that the City of Duluth should:” and responded with either, “Not employ the bridge operator during the winter” or “Employ the bridge operator during the winter.”

As in studies one and two, participants were also asked to provide foreseeability, probability, and causality ratings, as well as one measure of their perceived personal relevance to the Chairperson of the City of Duluth and three measures of the extent of their self-referencing to the Chairperson of the City of Duluth (see Appendix H). The dependent measures gauging the extent of participants’ self-referencing served as a manipulation check for the self-referencing instruction manipulation in addition to allowing for analyses examining the hypothesized effects of self-referencing on the dependent measures of foreseeability, probability, causality, and negligence.

I also included three manipulation check questions for the causal proximity variable, to verify that the manipulation of the number of intermediate events between the target defendant behavior, or the decision about whether to employ a bridge operator during the winter, and the (potential) outcome, or the flood on the Miniwapa River, had the intended effect on participants' perceptions of the case summary. Specifically, participants were asked whether they agreed with the following three statements on a Likert-type scale from one (strongly disagree) to nine (strongly agree): "I can easily explain how the flood on the Miniwapa River occurred/could occur," "Broken ice on the Miniwapa River caused/could cause a lot of damage to boats and barges tied up at docks on the shore," and "The chain of events that caused the/could cause a flood on the Miniwapa River was/would be long and complicated."

Results

Preliminary Analyses

Preliminary analyses indicated that there were no significant differences in the effects of the three and five event conditions of the intermediate events variable, but there were some differences between the one and three event conditions as well as the one and five event conditions. Therefore, for purposes of data analysis, I combined the three and five event conditions into a single "complex causal chain" condition, and the one event condition remained as the "simple causal chain" condition. Thus, the originally three-level causal proximity variable became a two-level variable in the tested model. Again, the same model that achieved good model fit in Experiment Two also achieved excellent model fit with the data from Experiment Three on the first analysis, so no paths were altered or added to the originally tested model.

Model Fit

The full model comprised of the component models illustrated by Figures 26, 28, 30, 32, 34, 36, and 37 was tested using Structural Equation Modeling with MPlus Version 5.0, using the default probit (mean structure) analysis with the WLSMV estimator and bootstrapping to correct for any non-normality in the data. The model yielded an excellent fit to the data. The overall Chi-Square test of model fit was statistically non-significant ($X^2(15) = 15.16, p = .44$), the Comparative Fit Index (CFI) was 1.00, and the Root Mean Square Error of Approximation (RMSEA) was 0.007, all indicating good global model fit. There were no modification indices above the minimum value of 3.84, indicating good focused model fit. The factor loadings for each of the three self-referencing indicators onto the latent self-referencing variable were high ($\beta = .79, \beta = .83, \beta = .90$), confirming that they were in fact appropriate measures of the latent variable. The significant paths found in the tested model are illustrated by the component models in Figures 27, 29, 31, 33, 35, and 38.

Manipulation Checks

Although the number of intermediate events included in the scenario between the initiating target behavior (not hiring a bridge operator for the winter) and the outcome (the flood) did not affect whether participants felt they could easily explain how a flood could occur/the flood occurred, it did have the expected effects on the other two manipulation checks. Specifically, the more intermediate events, the more mock jurors agreed that broken ice caused/could cause a lot of damage to boats and barges on the river ($\beta = .21, p < .01; M = 5.26, M = 6.48$). Also, the more intermediate events they read about, the more participants agreed that the chain of events leading up to a/the flood was

long and complicated ($\beta = .12, p = .08; M = 4.78, M = 5.23$). In general, the results of these manipulation checks indicate that participants did perceive the appropriate differences between the three increasing intermediate event conditions.

Despite the apparent effectiveness of the manipulation of the number of events occurring between the City's initiating decision not to employ a full-time drawbridge operator during the winter and a potential/the actual flood on the Miniwapa river, however, the manipulation did not have the intended effect on mock jurors' counterfactual mutations of the target decision. This is most likely due to a lack of variance in the counterfactual measure, as 80.4% of the participants mentioned the employment of a bridge operator during the winter months in response to the "...if only..." prompt following the scenario. A list of the frequencies and percentages of all responses to the counterfactual prompt can be found in Table 3.

Furthermore, knowledge of the outcome, in this scenario, a flood on the Miniwapa River causing one million dollars in damage to a nearby bakery, had no effect on any of the measures in this study. I did not observe the traditional hindsight bias in participants' ratings of the foreseeability or probability of a flood nor in their judgments of the City's negligence (hindsight) or requisite decision (foresight) regarding the employment of a full-time drawbridge operator during the winter.

Additionally, as found in Experiment Two, the self-referencing manipulation had the intended effect on the latent measure, such that participants who were given self-referencing instructions reported engaging in significantly more self-referencing to the Chairperson of the City of Duluth than those who were not given such instructions (Total: $B = .42, \beta = .14, p < .05; M = 7.14, M = 6.71$, respectively). Finally, as in the first two

experiments and as hypothesized, the measures of the foreseeability and probability of a flood were significantly positively correlated ($\beta = .42, p < .01$).

Effects of Manipulations on Negligence Verdicts

With the exception of the marginal effect of self-referencing instructions described below, none of the manipulations, including the outcome knowledge by intermediate events interaction, affected mock jurors' negligence verdicts (see Figure 27).

Foreseeability/Probability as Mediators

For all tested effects involving foreseeability and probability, see Figure 28; for all significant effects involving foreseeability and probability, see Figure 29. First, the intermediate event manipulation affected mock jurors' judgments of the foreseeability of a flood on the Miniwapa River as hypothesized, such that the more intermediate events participants read about, the less foreseeable they found a flood (Total: $B = -.59, \beta = -.15, p = .04$; $M = 4.90, M = 4.38$). Second, outcome knowledge interacted with the number of intermediate events to affect mock jurors' probability ratings (Total: $B = .30, \beta = .12, p = .052$; Direct: $B = .33, \beta = .14, p = .03$). When they were unaware of the outcome, participants' ratings of the probability of a flood decreased as the number of intermediate events described increased ($B = -.46, \beta = -.17, p = .08, M = 2.87, M = 2.06$), but when they were aware of the outcome, the number of intermediate events had no influence on participants' probability ratings ($B = .29, \beta = .09, p = .35, M = 2.18, M = 2.83$). Third, as predicted, the more probable mock jurors felt that a flood was, the more likely they were to find the City negligent (hindsight) or recommend that the City hire a bridge operator for the winter (foresight) (Total: $B = .25, \beta = .58, p < .01$). Finally, probability ratings mediated a marginally significant effect of the outcome knowledge by intermediate

events interaction on participants' negligence verdicts (Indirect: $B = .08$, $\beta = .08$, $p = .07$).

Counterfactuals as a Mediator

As found in study one, mock jurors who counterfactually manipulated the City's decision regarding the employment of a full-time bridge operator for the winter in response to the "...if only..." prompt following the scenario were significantly more likely to find the City negligent or recommend that the City hire a full-time operator (Total: $B = .32$, $\beta = .32$, $p < .01$; $M = .81$, $M = .64$; see Figure 31).

Counterfactuals & Foreseeability/Probability as Mediators

Incongruent with the results of Experiment One and my hypotheses, counterfactual thoughts about the City's decision actually decreased participants' ratings of the foreseeability (Total: $B = -.30$, $\beta = -.17$, $p = .12$; $M = 4.95$, $M = 4.45$) and probability (Total: $B = -.40$, $\beta = -.17$, $p = .07$; $M = 3.00$, $M = 2.37$) of a flood in this study (see Figure 33). The negative effect of counterfactual thinking on probability judgments also extended to a marginally significant negative effect on negligence verdicts/recommendations (Indirect: $B = -.11$, $\beta = -.11$, $p = .10$; see Figure 33).

Counterfactuals, Causality, & Foreseeability/Probability as Mediators

For all tested effects involving counterfactuals, causality, foreseeability, and probability, see Figure 34; for all significant effects involving counterfactuals, causality, foreseeability, and probability, see Figure 35. First, as hypothesized and as found in the first two experiments, the more causal participants rated the City's decision, the more foreseeable (Total: $B = .15$, $\beta = .23$, $p < .01$) and probable (Total: $B = .16$, $\beta = .19$, $p < .01$) they found a flood. Second, as predicted by the model in Figure 34 and as prescribed

by law, there was a significant positive effect of participants' causal attributions about the City's decision on their negligence verdicts/recommendations, which was partially mediated by their probability judgments (Total: $B = .13$, $\beta = .34$, $p < .01$; Indirect: $B = .04$, $\beta = .11$, $p = .01$). The more causal of a flood mock jurors felt the City's decision was/would be, the more likely they were to find the City negligent or recommend that the City hire a bridge operator for the winter.

Effects Involving Self-Referencing

For all tested effects involving self-referencing, see Figures 36 and 37; for all significant effects involving self-referencing, see Figure 38. First, the latent self-referencing measure was negatively affected by the outcome information manipulation, as in the first two studies. Mock jurors reported engaging in less self-referencing to the Chairperson of the City of Duluth when they were told that a flood had occurred than when they were considering a flood in foresight (Total: $B = -.75$, $\beta = -.25$, $p < .01$; $M = 6.57$, $M = 7.32$, respectively). Second, self-referencing instructions interacted with the number of intermediate events to marginally affect mock jurors' reported self-referencing to the Chairperson (Total: $B = -.17$, $\beta = -.11$, $p = .09$). Specifically, when participants did not receive instructions, there was a non-significant negative trend such that as the number of intermediate events increased, mock jurors' self-referencing increased ($M = 6.41$, $M = 6.76$). When they did receive instructions to self-reference to the City Chairperson, however, participants' reported self-referencing decreased as the number of intermediate events described increased ($M = 7.51$, $M = 6.83$).

The self-referencing manipulation and participants' reported self-referencing had conflicting effects on their attributions of the causality of the City's decision not to

employ a bridge operator during the winter on a/the flood. The more they reported self-referencing to the Chairperson of the City of Duluth, the more causal mock jurors rated the City's decision not to hire a bridge operator (Total: $B = .32$, $\beta = .18$, $p = .02$).

However, those participants who received instructions to self-reference to the Chairperson rated the City's decision as less causal, on average, than those who did not receive self-referencing instructions (Total: $B = -.92$, $\beta = -.17$, $p = .02$; $M = 6.02$, $M = 7.03$, respectively). Additionally, mock jurors' causal attributions about the City's decision fully mediated the marginal negative effect of self-referencing instructions on foreseeability judgments (Total: $B = -.46$, $\beta = -.12$, $p = .06$; $M = 4.73$, $M = 4.37$; Indirect: $B = -.17$, $\beta = -.05$, $p = .07$) as well as the effect of instructions on probability ratings (Indirect: $B = -.18$, $\beta = -.04$, $p = .09$).

Finally, as found in Experiment Two, self-referencing instructions had a marginally significant negative total effect on participants' negligence verdicts/recommendations, such that those mock jurors who were instructed to self-reference to the City Chairperson were less likely to find the City negligent in hindsight and recommend that the City employ a full-time bridge operator during the winter in foresight (Total: $B = -.36$, $\beta = -.18$, $p = .08$; $M = .83$, $M = .72$). Again, the combination of effects of self-referencing instructions on participants' causal attributions, foreseeability and probability judgments, and negligence verdicts/recommendations suggests that self-referencing may be an effective debiasing tool for civil defendants.

Discussion

Unfortunately, I did not observe a hindsight bias on participants' foreseeability, probability, or negligence judgments in Experiment Three (see Figures 27 and 29). In

fact, outcome knowledge did not significantly affect any variables in the model other than its consistent negative effect on participants' reported self-referencing to the defendant. Additionally, the causal proximity manipulation did not influence participants' counterfactual thoughts as hypothesized, though it did have a significant effect on foreseeability judgments. Specifically, as the number of (potential) intermediate events between the City's decision and the (potential) flood increased, participants found a flood less foreseeable (see Figure 29). Further, none my hypotheses regarding the effects of the interaction of hindsight (outcome knowledge) and causal proximity (number of intermediate events) were supported in Experiment Three (see Figure 35).

Also unexpectedly, participants' counterfactual thoughts about the City's decision did not influence their attributions about the causality of that decision in the (potential) flood (see Figure 35), but they did decrease foreseeability and probability judgments, contrary to my hypotheses and the results of Experiment One (see Figure 33). Those participants who counterfactually mutated the City's decision not to hire a bridge operator for the winter felt that a flood was less foreseeable and less probable than participants who mutated another event.

The only set of effects, other than those involving self-referencing instructions, that supported my hypotheses and was consistent with the first two studies was that of causal attributions on foreseeability, probability, and negligence judgments/recommendations (see Figure 35). Of the two hypothesized indirect effects of causality on negligence/recommendations through foreseeability and probability, only that involving probability was significant, as participants' increased ratings of the probability of a flood, but not their ratings of a flood's foreseeability, were associated

with an increased likelihood of their finding the City negligent (hindsight) or recommending that the City hire a full-time bridge operator (foresight; see Figure 29). Again, this consistent pattern of results indicates that mock jurors in my research did use legally appropriate and relevant factors in making negligence judgments as well as recommendations for a City Council's critical decision.

Finally, the effects of self-referencing instructions in this study provide additional support for my proposition that while self-referencing is not necessarily an effective hindsight debiasing technique in particular, it may prove successful in reducing the likelihood that jurors find a defendant negligent. The instructions were again successful at increasing participants' reported self-referencing to the defendant, which was also negatively affected by outcome information, as mentioned above (see Figure 38). While the self-report measure did not have any of the hypothesized negative effects on the other endogenous variables in the model, self-referencing instructions did decrease participants' causal attributions regarding the City's decision, judgments of the foreseeability of a flood, and likelihood of finding the City negligent (hindsight)/recommending that the City hire a full-time bridge operator for the winter (foresight; see Figure 38).

Chapter VIII

General Discussion

Hindsight Bias

I observed the traditional hindsight bias in Experiment One, meaning that participants who were aware of the outcome of the sequence of events described rated that outcome as more foreseeable (predictable) than those who were not aware of the outcome. This effect was not replicated in Experiments Two or Three, however. Although outcome information had no effect on mock jurors' foreseeability judgments in the second study, the hindsight bias was reflected in their negligence verdicts. Participants who were aware that the train had actually derailed were significantly more likely to find the defendant negligent for the same behavior it exhibited prior to the train's departure in both conditions. If defendants are to be judged solely on the appropriateness of their behavior, regardless of what outcome that behavior may have led to, these findings suggest a flaw in jurors' decision-making in the form of hindsight bias.

Though the outcome information manipulation had the predicted effects on foreseeability and negligence judgments in Experiments One and Two, respectively, it also had an unexpected negative effect on mock jurors' probability ratings in both experiments. Participants who were aware of the outcome actually rated that outcome as less probable than those who were unaware of the outcome. As foreseeability and probability were conceptualized as similar indicators measuring the same underlying construct of predictability and were highly correlated in both studies, the opposite effect of outcome information on each variable is curious. In fact, the effects involving these two variables were discrepant a number of times between the two experiments.

Specifically, many significant effects involving foreseeability judgments were either non-significant involving probability ratings or were significant but in the opposite direction. This pattern of results indicates that participants in this research considered foreseeability and probability to be two distinct and different concepts. . Although both measures were designed to assess hindsight bias, my results suggest that only mock jurors' foreseeability judgments did so and that their probability ratings more accurately measured some other construct.

Moderation of the Hindsight Bias

Counterfactual Thinking

Experiments One and Two: Normality of Behavior

The manipulation of the normality of the defendant's target behavior, designed to manipulate participants' counterfactual thoughts about said behavior, did moderate the hindsight effect of outcome knowledge on mock jurors' judgments of the foreseeability of that outcome as well as their negligence verdicts as predicted. However, the direction of this moderation was not as hypothesized. The hindsight bias effect was observed when the defendant's behavior was normal, eliciting significantly fewer counterfactual thoughts about the behavior, but not when it's behavior was exceptional, thus effectively encouraging counterfactual thinking. I predicted that counterfactual thinking would increase, or exacerbate, the hindsight bias, as found by Roese and Olson (1996), but my results supported the finding of Robbenolt and Sobus (1997) that counterfactual thinking decreases the hindsight bias. In fact, the hindsight bias only manifested itself on foreseeability judgments and negligence verdicts in Experiment One when participants

were least likely to engage in counterfactual thinking (i.e., when the defendant's behavior was normal).

One potential explanation for the pattern of results observed in this particular study involves the normality manipulation itself. As stated earlier, participants in the exceptional behavior condition read that the defendant had violated accepted industry protocols when loading and arranging the train cars for travel. It is possible that mock jurors reading this information assumed a negative outcome such as a derailment as a result of such a violation, as protocols are generally established because they are the safest, most efficient ways of doing things, and most people realized that not following safety guidelines can and often does lead to accidents and negative outcomes. So, if most participants in the exceptional behavior condition assumed or at least considered the possibility of a train derailment, the effect of the outcome information manipulation would become essentially irrelevant, because participants would already believe they knew what the outcome was whether or not they were explicitly told the train derailed. A closer look at the mean foreseeability ratings and percentage of negligence verdicts for each cell in the normality by outcome interaction lends some support to this speculation. When the defendant's behavior was normal, and participants would not necessarily assume a negative outcome, outcome knowledge significantly increased their ratings of the foreseeability of a/the derailment (no outcome knowledge: $M = 5.74$, outcome knowledge: $M = 6.17$) as well as the likelihood that they found the defendant negligent (no outcome knowledge: $M = .54$, outcome knowledge: $M = .58$). This is the traditionally observed hindsight bias. When the defendant's behavior violated accepted protocols, and participants may have automatically assumed a negative outcome, however, their

foreseeability ratings and likelihood of finding the defendant negligent were high regardless of actual outcome knowledge (foreseeability - no outcome knowledge: $M = 6.57$, outcome knowledge: $M = 6.76$; negligence - no outcome knowledge: $M = .93$, outcome knowledge: $M = .89$). Thus, the exceptional behavior condition may have effectively provided mock jurors with outcome information, or at least put the high possibility of such an outcome in their minds, such that their foreseeability and negligence judgments were not affected by actual outcome information because they already reflected a hindsight bias.

Another plausible explanation for the unexpected effects of the behavior normality manipulation is that something other than counterfactual thinking was driving the effects. Namely, the fact that the defendant's exceptional behavior also involved violating standard protocols, essentially breaking the rules, could very likely have confounded this variable. Therefore, it may be that the defendant's rule-breaking behavior rather than participants' tendency to counterfactually mutate the defendant's normal versus exceptional behavior affected mock jurors' attributions about the various variables in the model. Specifically, the hindsight effect of outcome knowledge on participants' foreseeability and negligence judgments may have been moderated by whether the defendant violated protocols or broke the rules rather than whether the defendant's behavior was exceptional. Thus, although my hypothesis regarding the exacerbation of the hindsight bias by counterfactual thinking was not supported in Experiment One, it may not have necessarily been disconfirmed either, if the normality manipulation actually represented rule-breaking versus exceptional behavior. Although the behavior normality manipulation had the intended effect on participants'

counterfactual thinking, due to the number of unintended effects it had on other variables in the model and likely unavoidable confounds associated with this kind of indirect manipulation, in future research I will directly manipulate counterfactual thinking about a target event simply by asking half of the participants to counterfactually mutate that event and not counterfactually prompting the other half.

As I did not observe a hindsight bias effect on mock jurors' foreseeability judgments in Experiment Two, there could be no moderation of such an effect by counterfactual thinking. Further, the normality, or counterfactual, manipulation did not moderate the hindsight effect of outcome information on negligence verdicts in the second study.

Experiment Three: Causal Proximity

I did not observe the traditional hindsight bias on either participants' foreseeability or probability judgments or their negligence verdicts/recommendations in the third study. Thus, there could be no moderation of such an effect by counterfactual thinking. Furthermore, the causal proximity manipulation of the number of intermediate events between the initiating event and the outcome did not have the hypothesized effect on participants' counterfactual thoughts in the first place, so any test of moderation of the hindsight bias using this manipulation would have been irrelevant.

Self-Referencing

My hypothesis that self-referencing may be an effective hindsight debiasing technique received little support across the three experiments. Although both the self-referencing instructions and self-report measure consistently decreased mock jurors' likelihood of finding the defendant negligent, and self-referencing instructions decreased their foreseeability ratings in studies two and three, the self-referencing manipulation did not interact with outcome knowledge to moderate a hindsight bias effect on either foreseeability or negligence judgments. Additionally, participants' reported self-referencing to the defendant was actually related to increased foreseeability and probability ratings in the first experiment as well as higher causality ratings in the third experiment, indicating that self-referencing was not an effective debiasing technique in those instances. Regardless of its lack of moderation of the hindsight bias, however, the consistent pattern of results across the three experiments suggests that self-referencing may be an effective technique in reducing the likelihood of negligence verdicts, at least when considering negligence alone. When considering the indirect path jurors may travel to arrive at negligence decisions through judgments of foreseeability, though, the beneficial effect of self-referencing is less clear. Self-referencing had conflicting effects on foreseeability ratings in studies one and two, so further research is needed to clarify this relationship. Thus, any conclusions regarding the potential for self-referencing as a hindsight debiasing technique or even as a defense strategy against negligence allegations await further study.

Though self-referencing instructions did not interact with the outcome information manipulation, the self-report measure of participants' self-referencing to the

defendant was negatively affected by outcome information. Specifically, mock jurors reported engaging in less self-referencing when they were aware of the outcome in all three experiments. This may be because the focus of participants' attention was shifted from the defendant's behavior leading up to the train's scheduled departure or the flood in foresight to the train derailment or flood itself in hindsight. Naturally, thoughts about the outcome of a sequence of events will trump those about events leading up to that outcome, both because the outcome is the latest event processed by participants in the sequence and because thinking about what the defendant did prior to the train's departure or the flood becomes less important than considering the derailment or flood and subsequent damage to the surrounding environment once known. Thus, with this shift of focus from the defendant in foresight to the derailment or flood in hindsight, it seems natural that mock jurors would spend less time self-referencing to the defendant, or considering what they would have done in the defendant's situation, when provided with outcome information to consider instead.

Counterfactuals, Causality, Foresseeability/Probability, and Negligence

The set of direct and indirect hypothesized paths from causality ratings to foreseeability judgments to negligence verdicts were consistently significant across Experiments One and Two, and to a lesser extent, in Experiment Three. Specifically, as predicted and as prescribed by law, causality (studies one, two, and three) and foreseeability (studies one and two) directly affected negligence, such that higher ratings of both were associated with a higher likelihood of negligence verdicts. Also as hypothesized, the effect of mock jurors' causality ratings on their negligence verdicts was partially mediated by their foreseeability judgments in Experiments One and Two. In

studies one and three, probability ratings also significantly increased the likelihood of negligence verdicts, and the causality to negligence relationship was partially mediated by probability. Further, the complete set of hypothesized paths from the normality manipulation to participants' counterfactual manipulations of the defendant's behavior, to causal attributions about that behavior, to foreseeability and probability ratings, to negligence verdicts was significant in the first study. I predicted that the relationship between mock jurors' counterfactual thoughts about the defendant's behavior and their foreseeability and probability ratings would be fully mediated by their causal attributions about that behavior. This hypothesis was supported in Experiment One with the path involving probability judgments, but causal attributions only partially mediated the path from counterfactuals to foreseeability judgments.

Conclusions, Practical Applications, and Future Research

As previously demonstrated in the literature and as found in the current research, providing jurors with information about a plaintiff's outcome may cause a hindsight bias that translates into higher ratings of the foreseeability of that outcome and/or a greater likelihood of negligence verdicts. The ideal solution to this problem would be not exposing jurors to any outcome information, but in the context of a civil trial, this is next to impossible. The bifurcation of negligence suits is an option, but as Wexler and Schopp (1989) noted, the theoretical and practical limitations associated with this debiasing method preclude its efficient and effective implementation in today's courts. Thus, effective debiasing techniques must be conceived, tested, and employed to prevent this unfair prejudice from affecting civil jury decisions against defendants. For example, the results of the current research suggest that although they may not effectively ameliorate

the hindsight bias itself, strategies that induce self-referencing to the defendant among jurors may be able to counteract such bias by decreasing jurors' judgments of the foreseeability of the outcome as well as their likelihood of finding the defendant negligent. Self-referencing is a particularly attractive pro-defense technique, as there are several ways in which jurors may be encouraged to put themselves in the defendant's shoes in a relatively unintrusive, efficient, and effective manner.

Additionally, awareness of the relationship between counterfactual thinking and judgments of causality, foreseeability (and to a lesser extent probability), and negligence observed in Experiment One may prove useful for attorneys involved in negligence litigation. Specifically, plaintiffs' attorneys would be wise to induce jurors' counterfactual thinking about the defendant's conduct that would undo their clients' unfortunate outcomes. To do so, attorneys might stress the fact that the defendant's behavior violated social norms of appropriate, ethical conduct, or was otherwise exceptional in some way, particularly if the potential harm resulting from that behavior was highly foreseeable. Furthermore, attorneys might take advantage of the causal primacy effect and encourage counterfactual thinking about the defendant's conduct by explicitly highlighting the causal connection between that initiating event and the plaintiff's outcome. This type of counterfactual thinking may then increase jurors' likelihood of finding that the defendant's conduct was negligent and was a proximate cause of the plaintiff's damages. Subsequently, these increased judgments of norm violation, causality, and foreseeability may translate into higher damage awards for the plaintiff, especially if the jurors wanted to punish the defendant for what they perceived to be egregious conduct.

On the other hand, defense attorneys might discourage jurors' perceptions that the plaintiff's damages were or should have been foreseeable by the defendant by enumerating the many intermediate events between the defendant's action (or inaction) and the plaintiff's outcome in a lengthy sequence of events. By obscuring the causal connection between the defendant's behavior and the plaintiff's damages, possibly even highlighting a more salient cause in one of the intermediate events, the results of the current research suggest that attorneys might decrease the likelihood that jurors will conclude that a reasonable person could/should have foreseen the negative outcome resulting from the defendant's behavior. Eliminating counterfactual thinking about the defendant's behavior and encouraging such thoughts about another intermediate causal event may also significantly reduce the likelihood that jurors will find the defendant's conduct negligent. Therefore, strategies that discourage jurors from engaging in counterfactual thinking about the defendant's behavior may also prove to be unintrusive and effective pro-defense techniques.

Finally, because my hypothesis regarding the relationship between mock jurors' counterfactual thinking and their judgments of the causality, foreseeability, and negligence of the defendant's behavior was only supported in one out of three studies, future research should further explore the mechanisms behind this relationship. As found in Experiments Two and Three, prior research has found that counterfactual thinking does not necessarily translate into judgments of increased causality, responsibility, or blame (Byrne et al., 2000; Mandel & Lehman, 1996; N'gbala & Branscombe, 1995, 1997; Roese & Olson, 1995; Spellman & Kincannon, 2001; Walsh & Byrne, 2004). Other research, however, has demonstrated that counterfactual thinking does influence

judgments of causality (Wells & Gavanski, 1989) and subsequently foreseeability (Roese & Olson, 1996) as found in Experiment One. Future research is necessary in order to determine under what circumstances counterfactual thoughts do and do not influence the legally relevant judgments of causality, responsibility, and blame; foreseeability and probability; as well as negligence and liability.

Limitations

The participants in this research were not actual jurors exposed to real, full-length trials whose decisions would impact the lives of real people, which is a recognized limitation of all mock juror/jury research. Moreover, the use of brief case summaries/transcripts over the internet was not as ecologically valid as live or videotaped trial/hearing stimuli would have been, although some research indicates that neither the mode of stimulus presentation (live/videotaped mock trial versus written case summary/transcript presented in person or via the internet) nor sample type (jury-eligible community members versus college students) significantly influence the results of mock juror/jury studies (Bornstein, 1999; Kerr & Bray, 2005; Krantz & Dalal, 2000; O'Neil & Penrod, 2001; Smith & Leigh, 1997).

Additionally, the findings reported here only reflect the judgments and decision-making of individual jurors and not deliberating juries. It is possible that the cognitive mechanisms that influence the decision-making of juries as groups are quite different than those operating for individual jurors prior to deliberation. Future research should examine the roles of counterfactual thinking, hindsight bias, and judgments of causality and foreseeability in the negligence decisions of deliberating juries. It is important to note, however, that the use of individual juror participants versus deliberating juries as

the unit of analysis still provides valuable information about the likely decisions of deliberating groups. Specifically, the literature indicates that the decisions of mock jurors and juries are often similar and that they differ in predictable ways (Bornstein, 1999; Kerr & Bray, 2005). Mock juror/jury research has consistently demonstrated that the initial opinions of individual jurors prior to deliberations have a significant impact on the group's final verdict, such that the jury is most likely to unanimously decide in favor of the majority opinion at the outset of deliberations (Kalvin & Zeisel, 1966). Thus, even in the absence of deliberations, the judgments of mock jurors can be quite informative about the likely decisions of juries as groups.

Furthermore, the results of the current research are limited to the particular stimulus materials and manipulations used in each study. Despite the similarities in results across the three experiments, there were also several important differences between them. These discrepancies may have been an artifact of idiosyncrasies in the specific stimulus materials utilized or of the manner in which the manipulations and/or measures were operationalized. As such, additional research is needed to replicate and expand upon the present findings using still different and better refined materials, manipulations, and measures. It is important to note, however, that it is very likely, if not given, that different cognitive processes will operate for jurors/juries evaluating different cases. Specifically, different fact patterns involve very different parties and situations, present evidence that is more or less equitable in strength against both sides, and differ in their tendencies to engage jurors in processes such as counterfactual thinking and self-referencing to one or both sides of the case. Thus, my finding that the model, or pattern, of mock jurors' decision-making differed across three sets of stimulus materials is not

necessarily a limitation, as it may reflect the variability in operations of these processes present in the real world.

Table 1.
Frequencies and Percentages of Counterfactual Statements Provided by Participants in Response to the “...If Only...” Prompt in Experiment One

Hindsight: “The train derailment and herbicide spill into the river below would not have happened if only:” Foresight: “Chicago Western and other railroads can avoid train derailments that cause serious harm to the surrounding environment if only:”	Frequency of Response	Percentage of Participants that Provided Response
the train cars had been properly arranged/the loaded cars had been up front and the empty cars in back, shorter cars in front and longer cars in back. ** Target Defendant Behavior**	334	48.8%
the train operator or railroad had been more careful/taken precautions/trained properly/had followed guidelines/rules/regulations.	71	10.4%
the driver or train had been going slower or slowed down/been more careful when approaching or going around the curve.	71	10.4%
the ratio of lateral to vertical force (the L/V ratio) was under the .08 limit.	61	8.9%
the train had taken an alternate or safer route or track/had avoided the dangerous area/hadn’t taken the curve.	34	5.0%
the curve at this location wasn’t so sharp/this location wasn’t so dangerous.	29	4.2%
the track had been fixed or straightened out/the track was built correctly, safer, with more planning, or more carefully/there were warning signs or safety rails around the track.	21	3.1%
the weight, cargo, or herbicide was evenly distributed throughout the train/the weight of the train cars was regulated/the cars or the tank car containing the herbicide weren’t so full or heavy.	18	2.6%
stringlining had not occurred.	10	1.5%
the train was not carrying harmful chemicals or herbicide/the railroad company did not carry harmful chemicals or herbicide on freight trains.	8	1.2%
the tank car containing the herbicide would have fallen on the ground next to the track and not into the river.	7	1.0%
the railroad spent a lot of money or put a lot of time into investigating safety on railroads/expensive safety measures were put in place.	6	.9%
the railroad had secured the train cars/secured the herbicide inside the train car.	4	.6%
the train had shorter or fewer cars.	3	.4%
the railroad company stopped operating trains altogether.	1	.1%
No counterfactual provided/The accident could not have been prevented/It was no one’s fault/It was a highly unlikely event.	6	.9%

Table 2.
Frequencies and Percentages of Counterfactual Statements Provided by Participants in Response to the “...If Only...” Prompt in Experiment Two

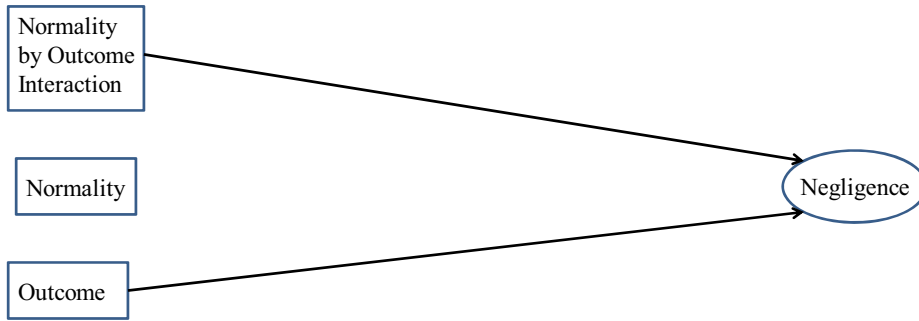
Hindsight: “The train derailment and herbicide spill into the river below would not have happened if only:” Foresight: “Chicago Western and other railroads can avoid train derailments that cause serious harm to the surrounding environment if only:”	Frequency of Response	Percentage of Participants that Provided Response
the train had fewer empty cars/the railroad would have removed the empty cars/the weight of the cargo was distributed more evenly across all the train cars/all of the train cars had been full. ** Target Defendant Behavior**	121	25.3%
the ratio of lateral to vertical force (the L/V ratio) was under the .08 limit.	77	16.1%
the driver or train had been going slower or slowed down/been more careful when approaching or going around the curve.	72	15.1%
the train operator or railroad had been more careful/taken precautions/trained properly/had followed guidelines/rules/regulations.	54	11.3%
the train had taken an alternate or safer route or track/had avoided the dangerous area/hadn’t taken the curve.	38	7.9%
the curve at this location wasn’t so sharp/this location wasn’t so dangerous.	33	6.9%
the track had been fixed or straightened out/the track was built correctly, safer, with more planning, or more carefully/there were warning signs or safety rails around the track.	30	6.3%
the train was not carrying harmful chemicals or herbicide/the railroad company did not carry harmful chemicals or herbicide on freight trains.	16	3.3%
the railroad spent a lot of money or put a lot of time into investigating safety on railroads/expensive safety measures were put in place.	14	2.9%
the herbicide was evenly distributed throughout the train/the tank car containing the herbicide weren’t so full or heavy.	6	1.3%
stringlining had not occurred.	5	1.0%
the railroad had secured the train cars/secured the herbicide inside the train car.	5	1.0%
the tank car containing the herbicide would have fallen on the ground next to the track and not into the river.	3	.6%
the railroad company stopped operating trains altogether.	2	.4%
No counterfactual provided/The accident could not have been prevented/It was no one’s fault/It was a highly unlikely event.	2	.4%

Table 3.
Frequencies and Percentages of Counterfactual Statements Provided by Participants in Response to the “...If Only...” Prompt in Experiment Three

Hindsight: “The flood described above could have been prevented if only:” Foresight: “Floods such as the potential one described above can be prevented if only:”	Frequency of Response	Percentage of Participants that Provided Response
the City of Duluth would have hired a bridge operator for the winter months. **Target Defendant Behavior**	180	80.4%
the City of Duluth would have taken better precautions and/or measures against flooding when building the bridge.	7	3.1%
the City of Duluth were more cautious about potential flooding./the river and all of its activities were monitored cautiously./everyone were informed about the potential for flooding and subsequent damage.	6	2.7%
the bridge were built higher.	4	1.8%
the embankments were higher.	4	1.8%
the bridge were not built in the first place./the bridge were taken down or closed to drivers in the winter and alternate routes of transportation across the river were found.	3	1.3%
the drawbridge was raised as the water levels rose or when boats and/or debris were in the river.	2	.9%
the boats docked upstream were tied up tight enough so that they would not brake loose during the winter.	2	.9%
water containment dams were built as well as proper drainage paths to direct overflowing water away from causing harm to the surrounding area.	2	.9%
there was someone from the city checking in on the bridge from time to time if there wasn't a full-time employee./there was a device on the bridge to alert someone from the city when the bridge needed to be raised in the winter.	2	.9%
the ice in the river did not melt down too quickly and the water level was not too high.	1	.4%
there were not potential blockages located upstream.	1	.4%
the predictions and measurements are realistic and resources are used to prevent, not to foresee events.	1	.4%
boats were not allowed to pass under the bridge during times of flooding.	1	.4%
No counterfactual provided/Floods and other natural disasters cannot be prevented./Hiring a bridge operator for the winter is/was unnecessary, because the likelihood of a flood is too small.	8	3.6%

Figure 1.

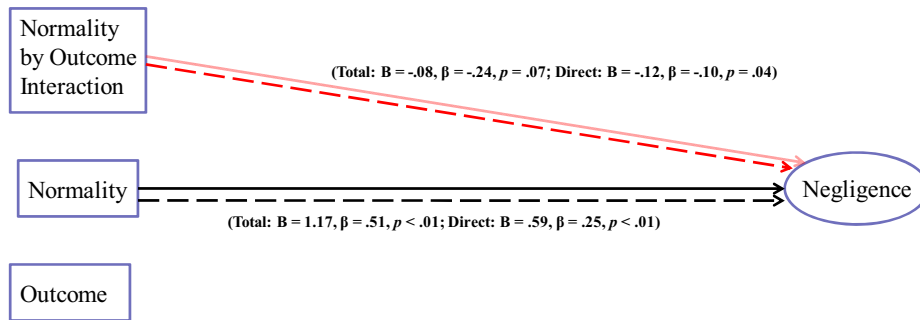
Experiment One: Hypothesized Effects of Manipulations on Negligence



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 2.

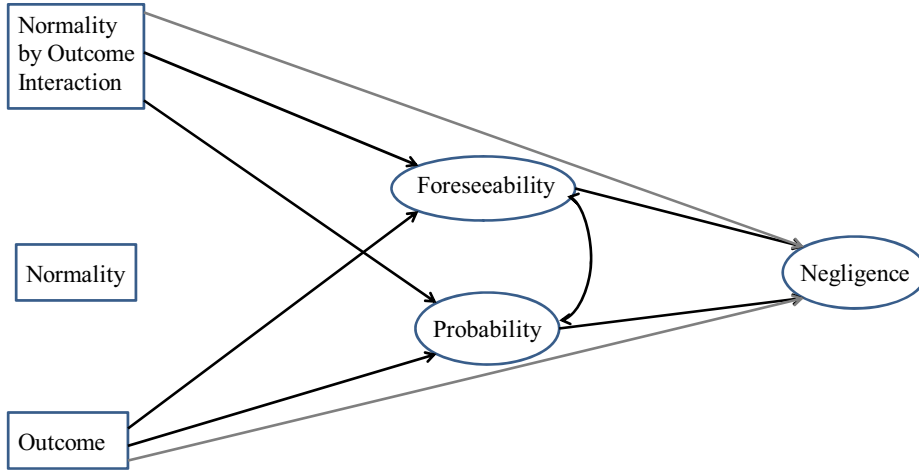
Experiment One: Significant Effects of Manipulations on Negligence



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 3.

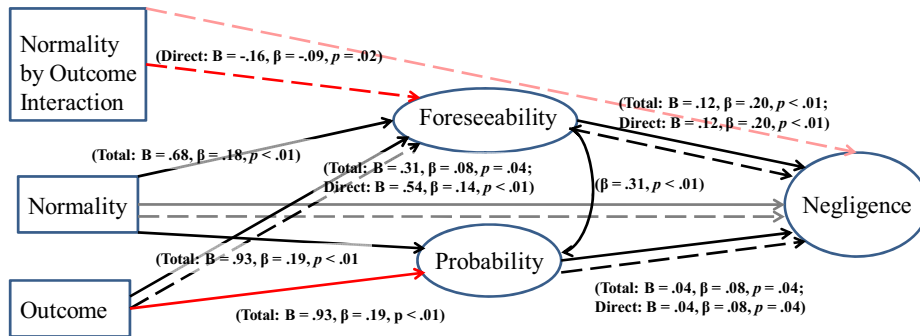
Experiment One: Hypothesized Effects Involving Foreseeability and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 4.

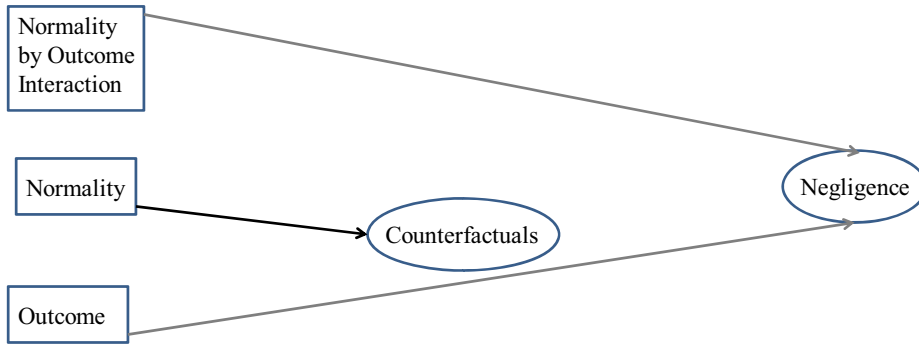
Experiment One: Significant Effects Involving Foreseeability and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 5.

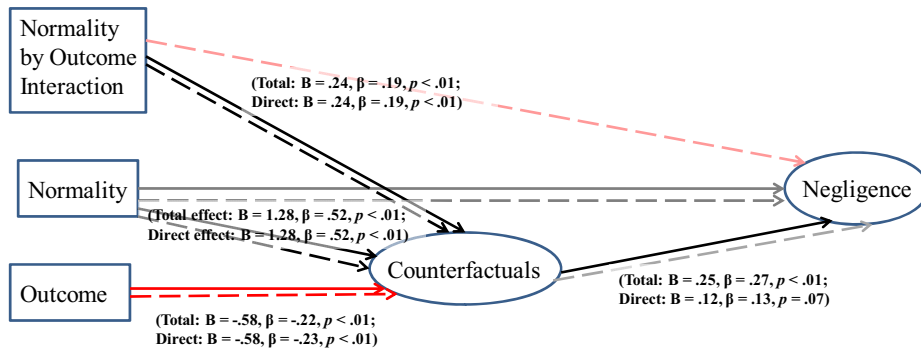
Experiment One: Hypothesized Effects Involving Counterfactuals



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 6.

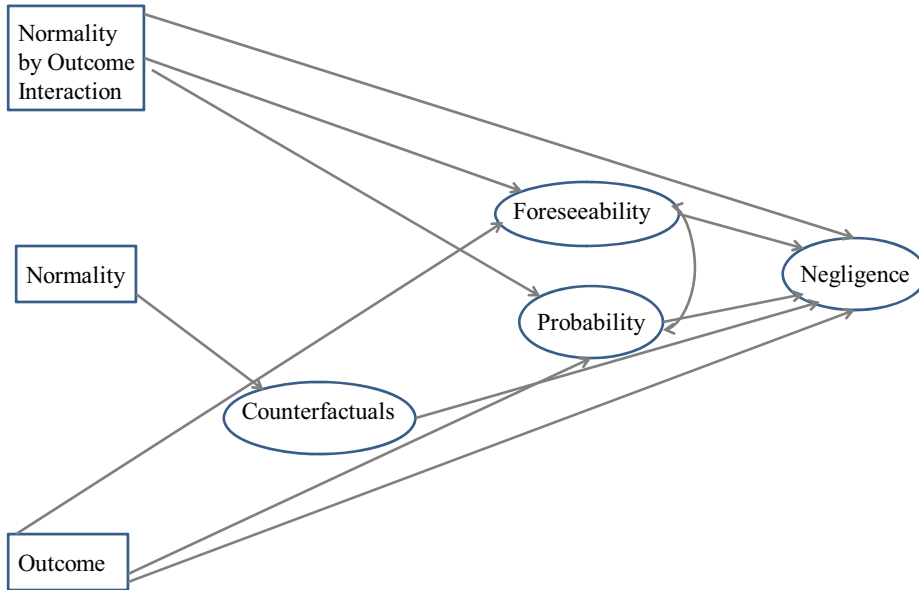
Experiment One: Significant Effects Involving Counterfactuals



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 7.

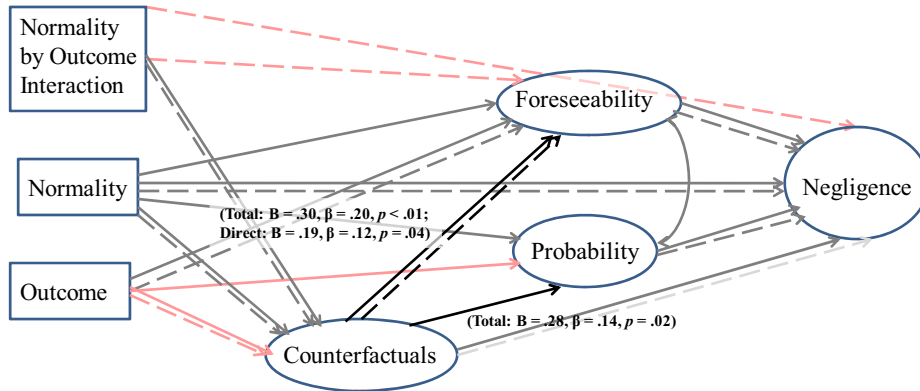
Experiment One: Hypothesized Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 8.

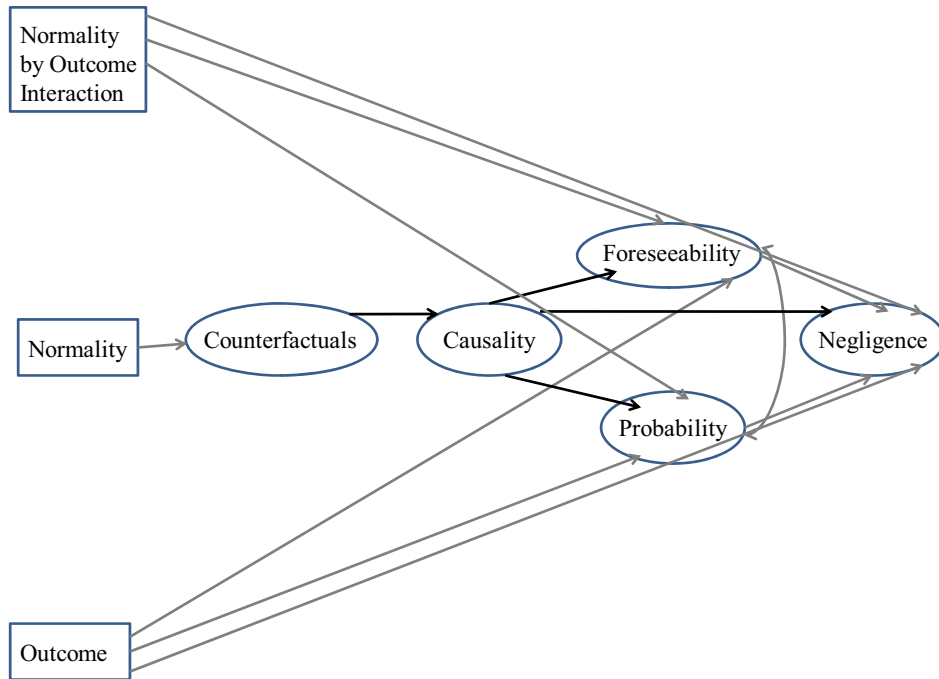
Experiment One: Significant Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 9.

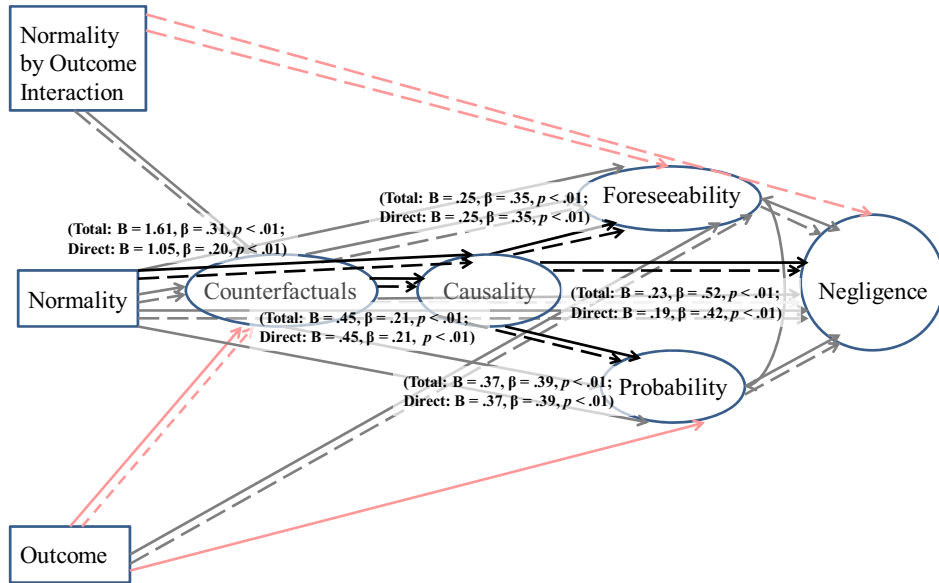
Experiment One: Hypothesized Effects Involving Causality



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 10.

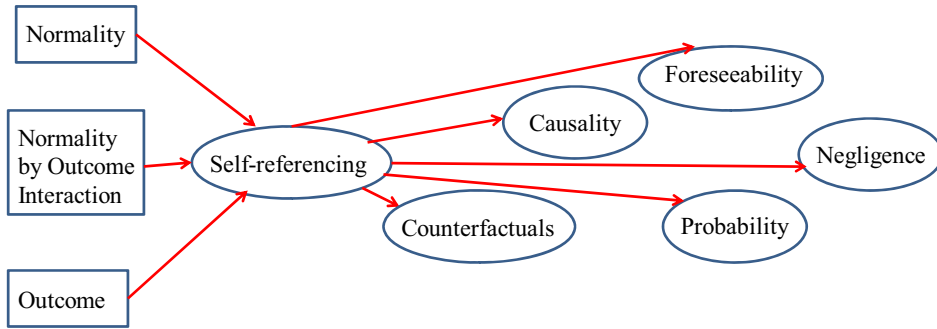
Experiment One: Significant Effects Involving Causality



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 11.

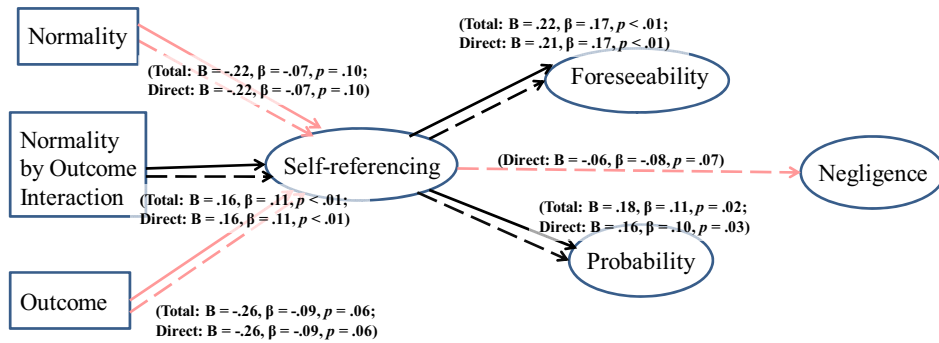
Experiment One: Hypothesized Effects Involving Self-Referencing



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 12.

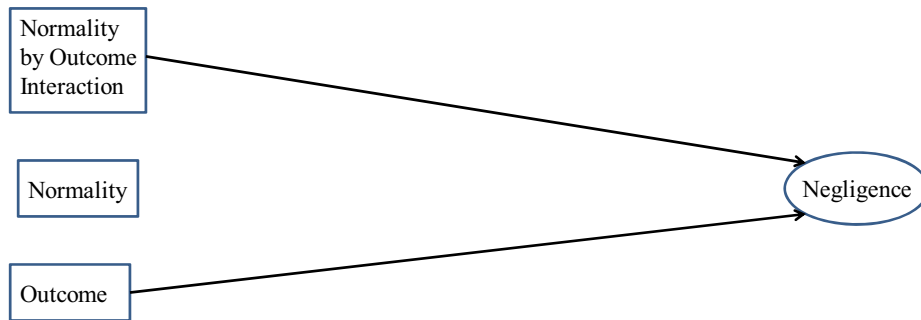
Experiment One: Significant Effects Involving Self-Referencing



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 13.

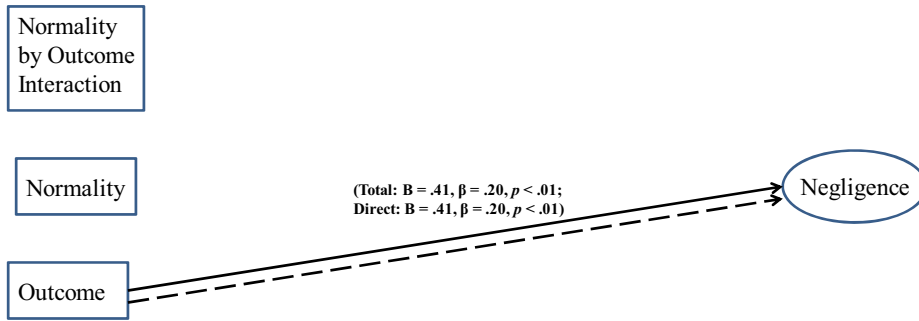
Experiment Two: Hypothesized Effects of Manipulations on Negligence



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 14.

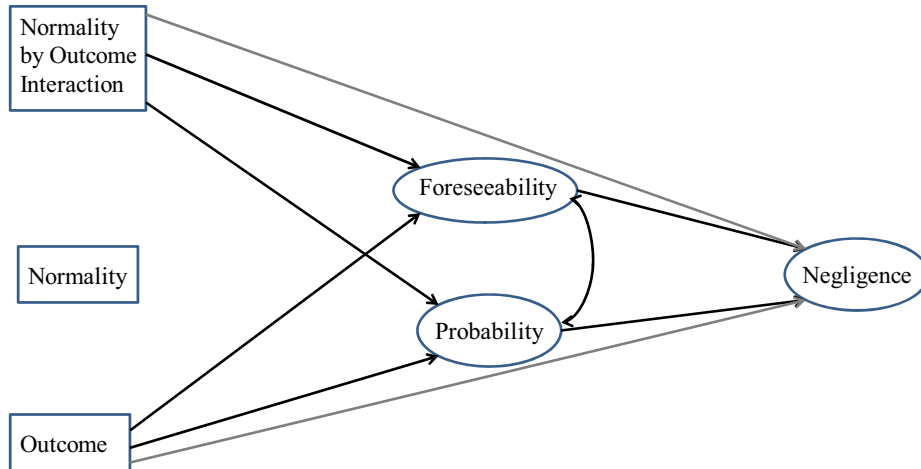
Experiment Two: Significant Effects of Manipulations on Negligence



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 15.

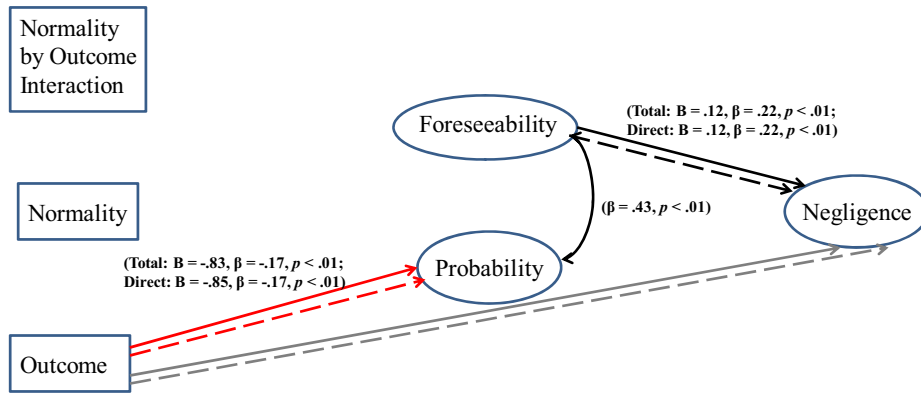
Experiment Two: Hypothesized Effects Involving Foreseeability and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 16.

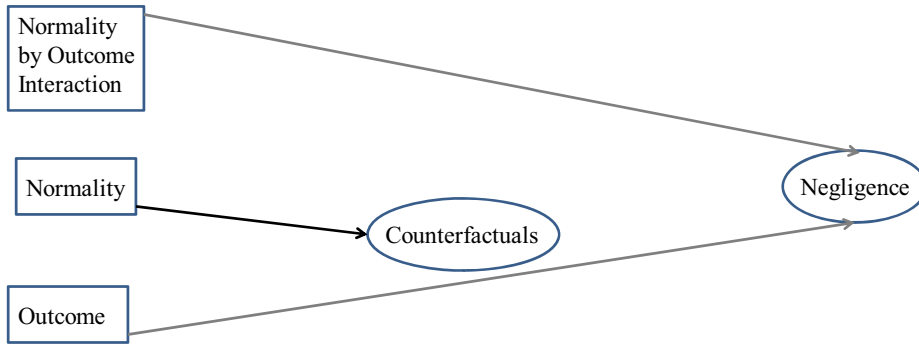
Experiment Two: Significant Effects Involving Foreseeability and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 17.

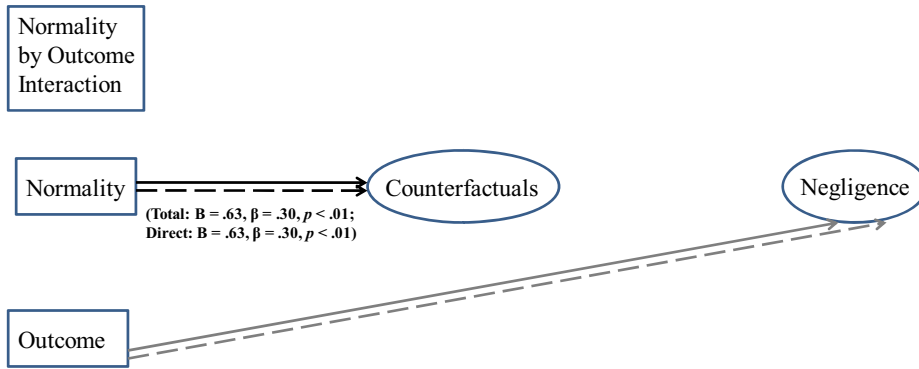
Experiment Two: Hypothesized Effects Involving Counterfactuals



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 18.

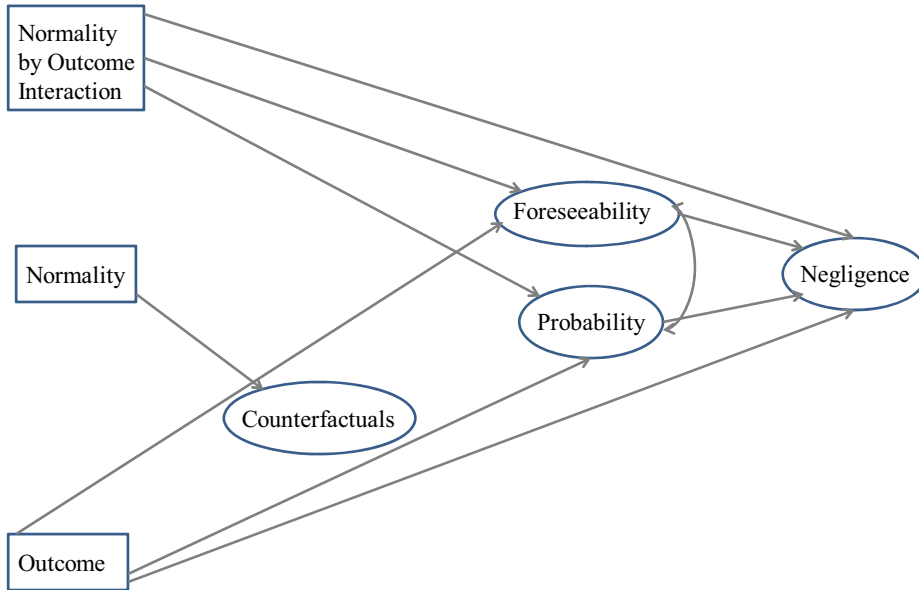
Experiment Two: Significant Effects Involving Counterfactuals



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 19.

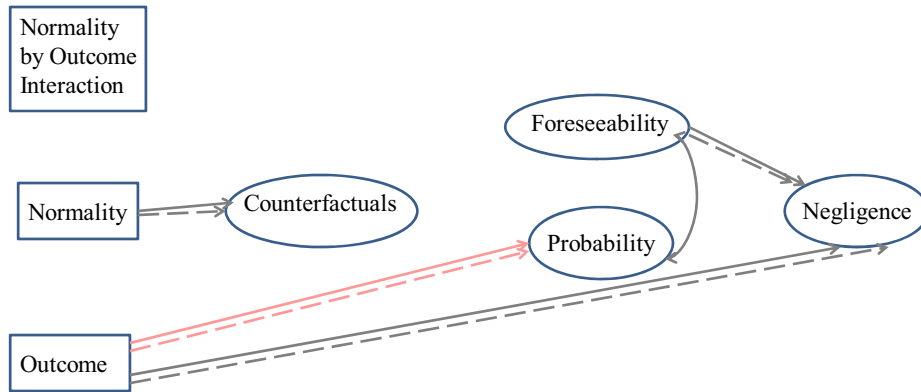
Experiment Two: Hypothesized Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 20.

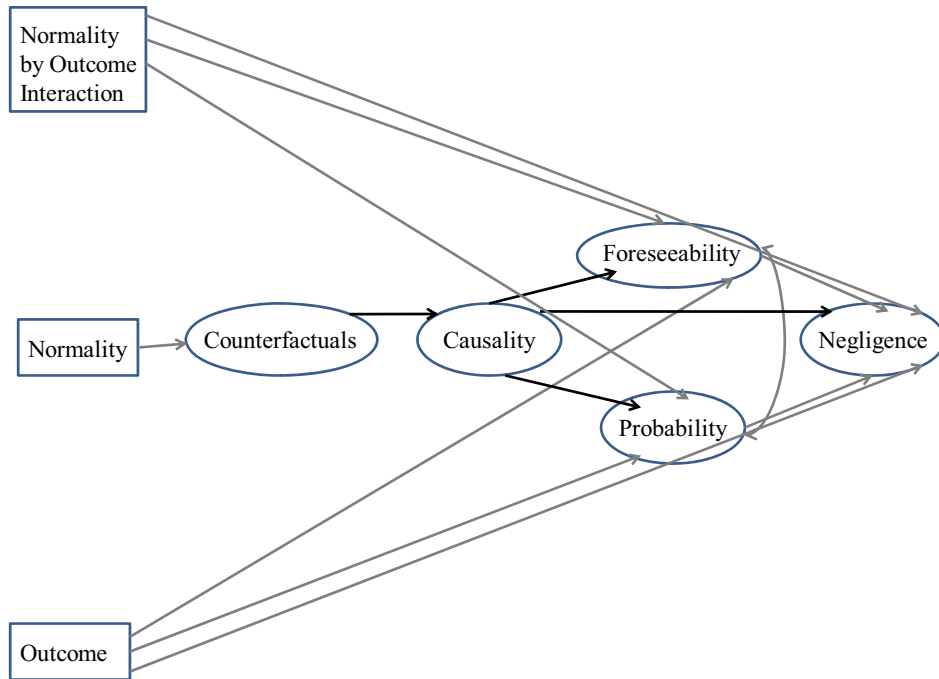
Experiment Two: Significant Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 21.

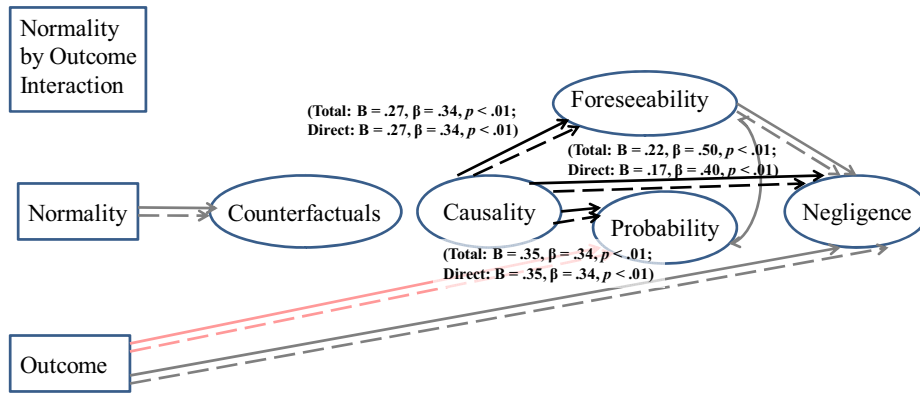
Experiment Two: Hypothesized Effects Involving Causality



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 22.

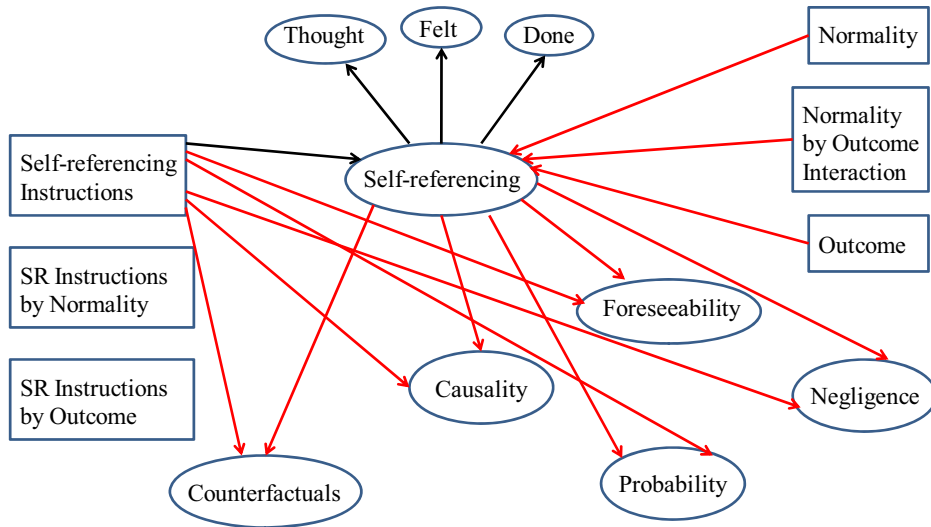
Experiment Two: Significant Effects Involving Causality



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 23.

Experiment Two: Hypothesized Effects Involving Self-Referencing



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 24.

Experiment Two: Hypothesized Effects Involving Self-Referencing Interactions

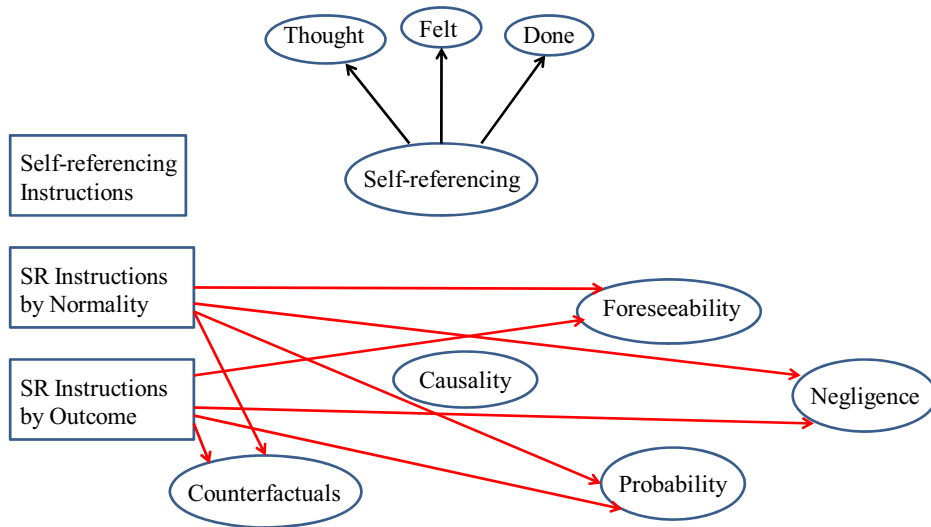
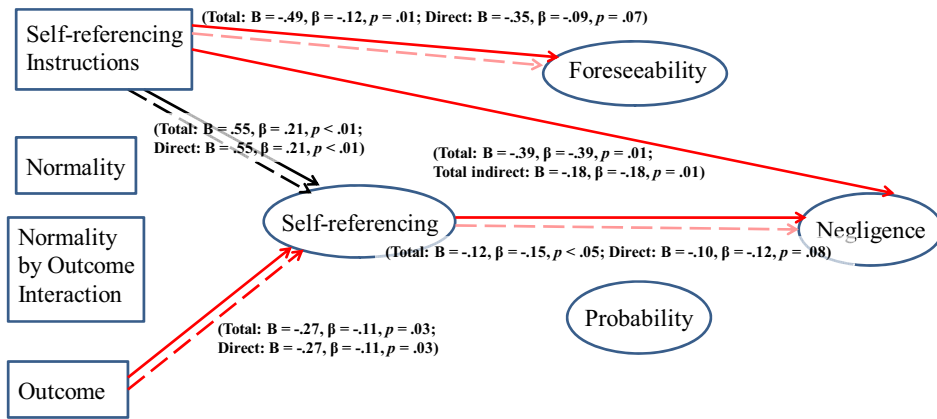


Figure 25.

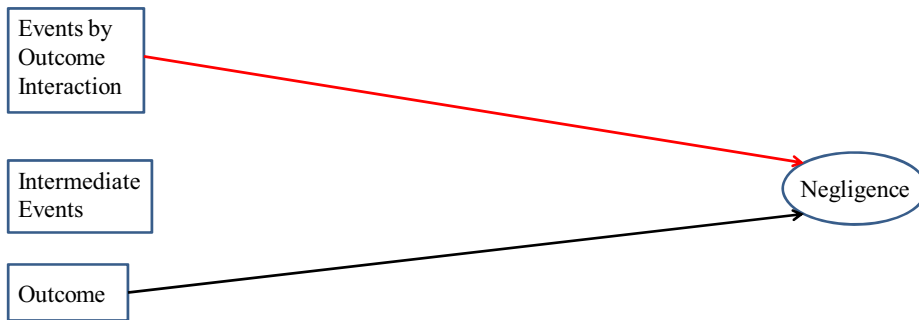
Experiment Two: Significant Effects Involving Self-Referencing



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 26.

Experiment Three: Hypothesized Effects of Manipulations on Negligence



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 27.

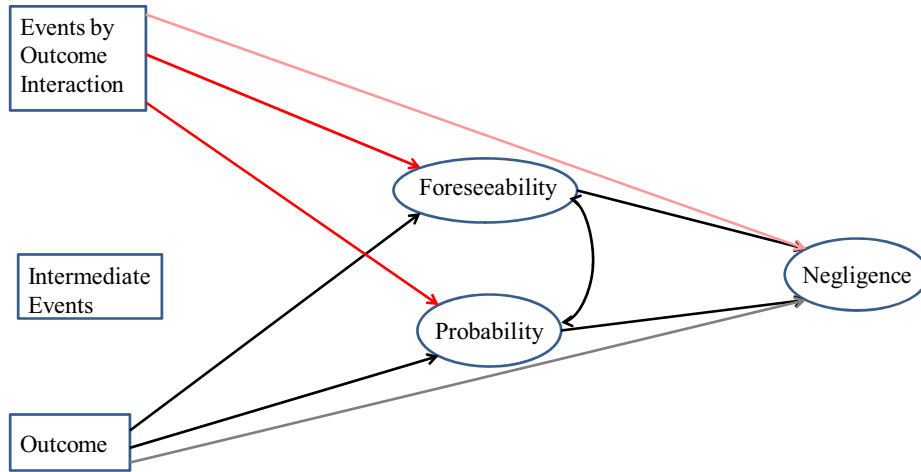
Experiment Three: Significant Effects of Manipulations on Negligence



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 28.

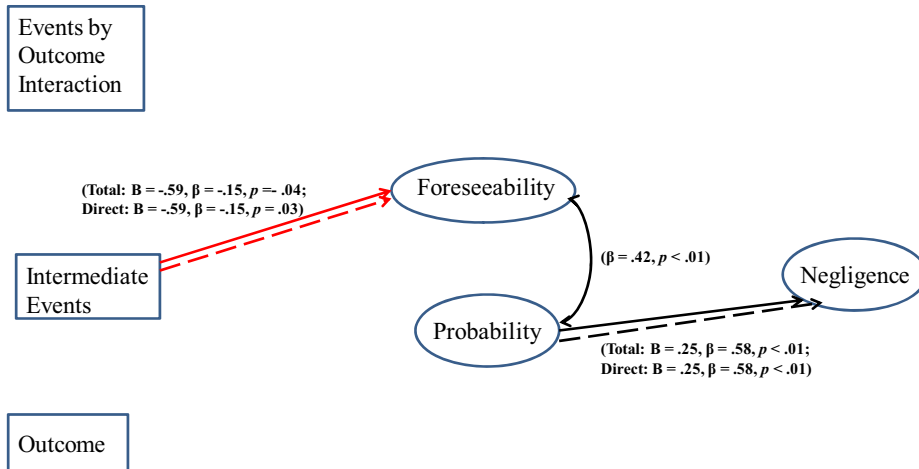
Experiment Three: Hypothesized Effects Involving Foreseeability and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 29.

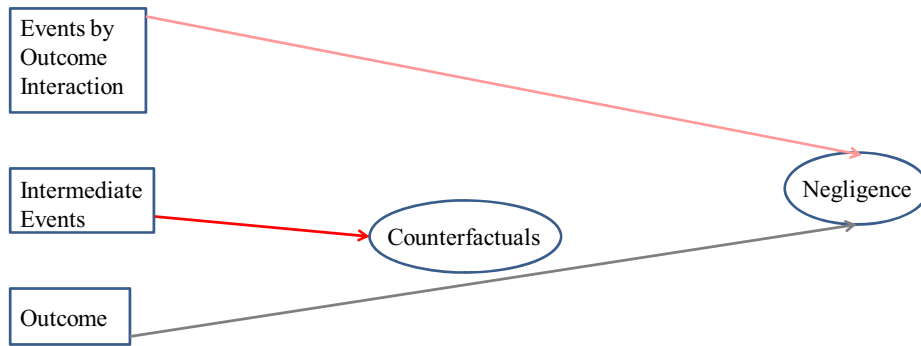
Experiment Three: Significant Effects Involving Foreseeability and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 30.

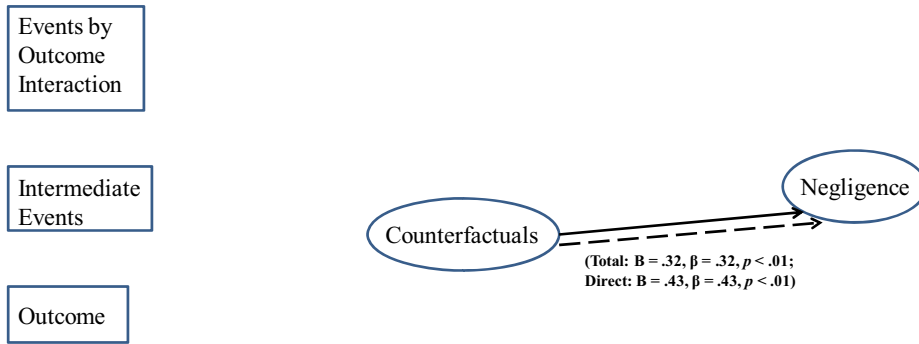
Experiment Three: Hypothesized Effects Involving Counterfactuals



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 31.

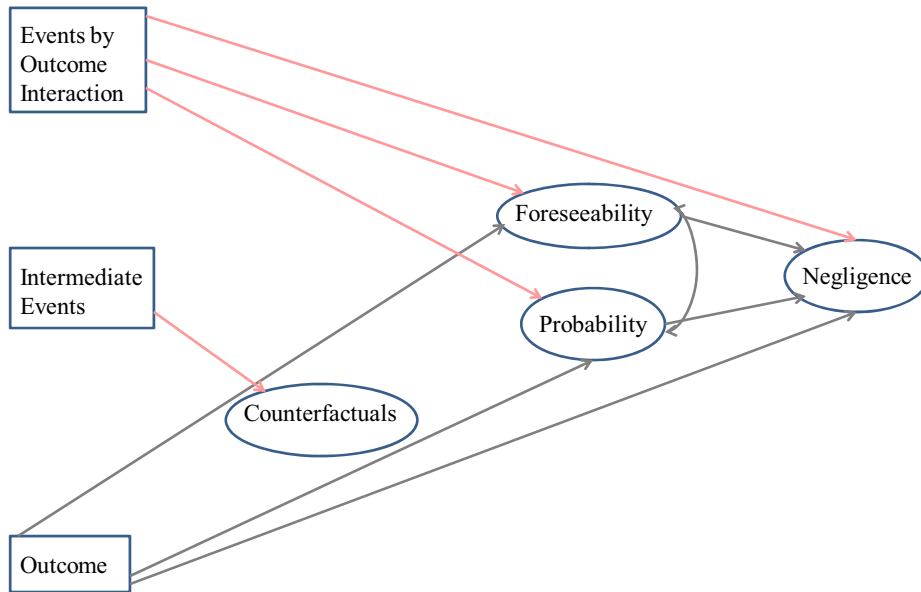
Experiment Three: Significant Effects Involving Counterfactuals



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 32.

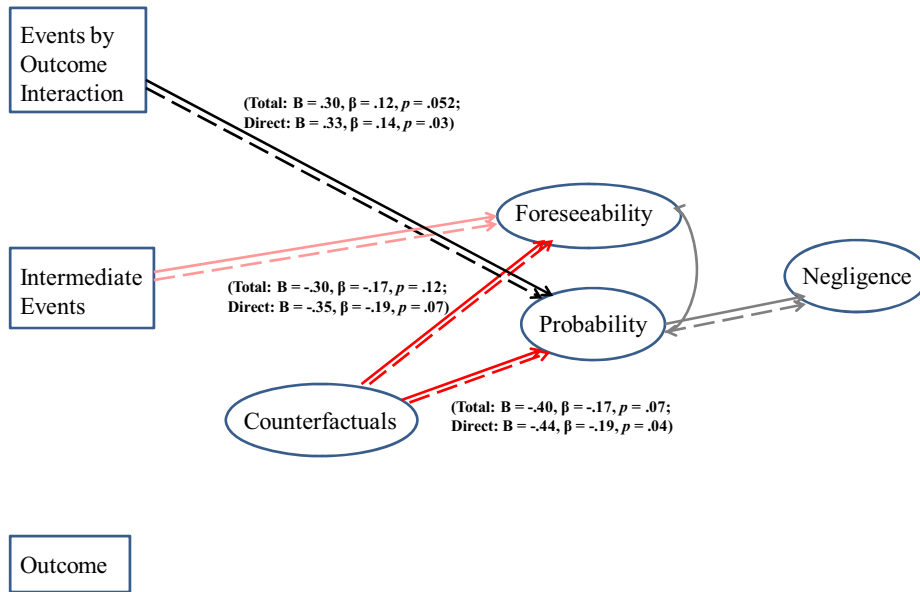
Experiment Three: Hypothesized Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 33.

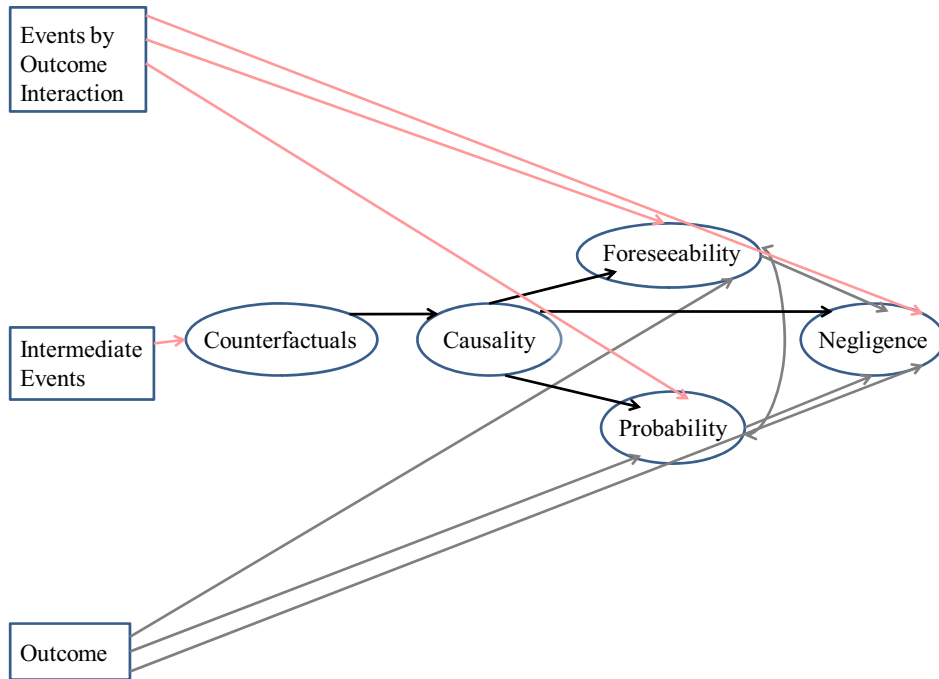
Experiment Three: Significant Effects Involving Counterfactuals, Foreseeability, and Probability



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 34.

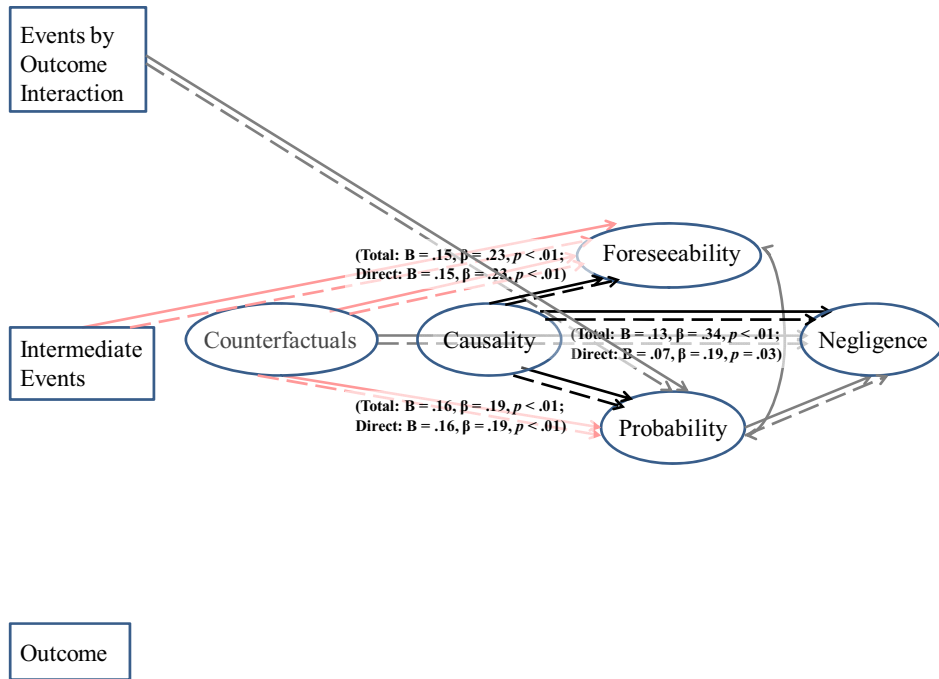
Experiment Three: Hypothesized Effects Involving Causality



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 35.

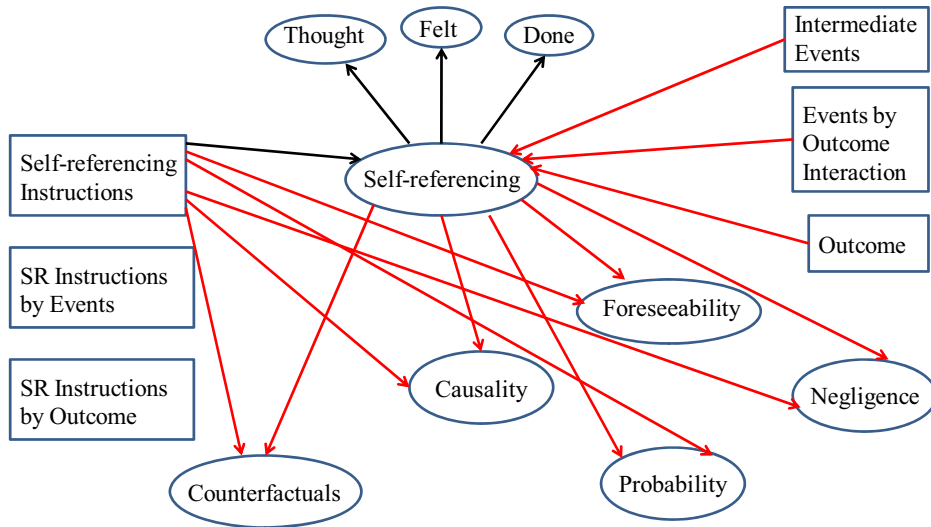
Experiment Three: Significant Effects Involving Causality



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 36.

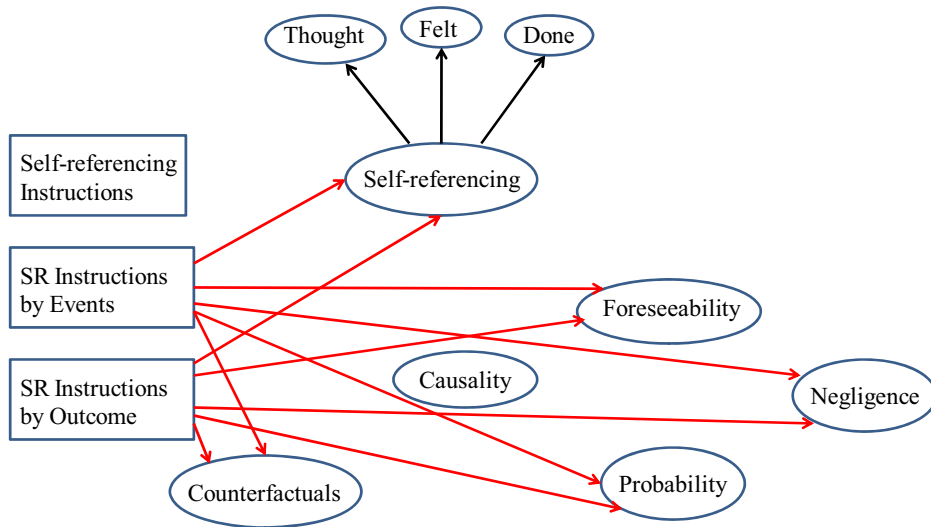
Experiment Three: Hypothesized Effects Involving Self-Referencing



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 37.

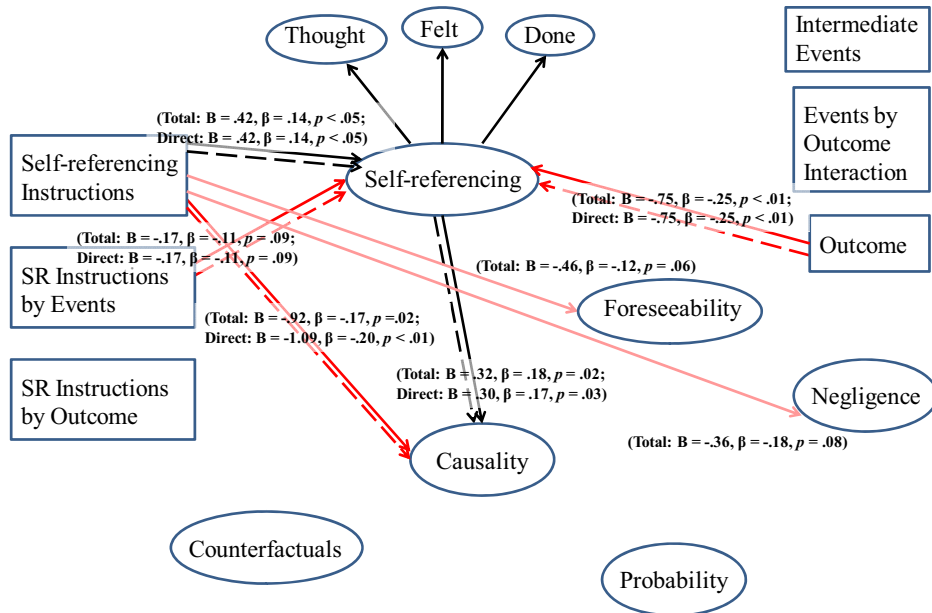
Experiment Three: Hypothesized Effects Involving Self-Referencing Interactions



Note. Black lines represent positive relationships, and red lines represent negative relationships.

Figure 38.

Experiment Three: Significant Effects Involving Self-Referencing



Note. Solid lines represent total effects, and dashed lines represent direct effects. Black lines represent positive relationships, and red lines represent negative relationships.

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Appendix A



Thank you for looking into our study. Over the next few pages you will read a description of a case and some jury instructions, and answer some questions about the case. Before participating, please read the information in the official consent document below.

****IMPORTANT: You must use Internet Explorer to complete this online experiment. The webpages may not function properly with other web browsers, such as Mozilla Firefox, etc.****

Please try to complete this study at one time. If for any reason you are not able to complete the study at one time, you will have to start over. The experiment takes roughly one hour to complete.

Please note, you must have cookies and JavaScript enabled on your browser in order to participate. If you click the button below but do not leave this page, your browser is not supporting cookies. Cookies are used only so that you can have a unique identification number for this study; no personal information will be stored in cookies.

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Project Title: Civil Law Suit

IRB Approval #070507-00

As a student in the FIU Psychology Participant Pool (enrolled in PSY2020 or other class), you are invited to participate in a research study conducted over the Web. The following information is provided to help you make an informed decision whether or not to participate. Your participation is completely voluntary, and not participating will not affect your class grade in any way. You must be at least 18 years old to participate.

Purpose of the Study: The purpose of this study is to examine what factors influence jurors' decision making. Participation in this study will require about one hour of your time.

Study Procedures: You will be asked to read a case scenario involving a civil lawsuit in which a plaintiff is suing a defendant for negligence. You will be asked to answer questions about the events described on a Web page. You will be asked to imagine you are a juror in the case and to decide whether the defendant is liable and whether the plaintiff is entitled to any monetary damages. We will also ask your opinion on various aspects of the case. You can refuse to answer any question and cease participation at any time.

Risks: The only risk to participating in this study is that you might become upset when you read or render a verdict about the case, involving an automobile accident, especially if you or someone you know has been involved in a similar accident. This event is unlikely, but if you are concerned about it you may withdraw from the study at any time.

Benefits: Although this study is not designed to help you personally, you may find the learning experience enjoyable, you may learn a little bit about how psychological research is conducted, and the process may help you better understand the legal process. The information gained from this study will help us better understand the factors that influence jurors' decision processes.

Privacy: Any information obtained during this study that could identify you will be kept strictly confidential. The study will collect information about your IP address and the browser you are using. No personal information will be placed on your browser by the use of cookies. So that participation credit may be given, you will be required to enter your Panther ID number and your name. The personal information collected will be deleted from the database once data collection is completed and credit has been given. The information gained from this study may be published in scientific journals or presented at scientific meetings, but your identity will be kept strictly confidential.

Compensation: There is no financial compensation to you as a result of participating in this study. Completion of this study earns partial credit toward the FIU Psychology Participant Pool requirements as outlined by your professor and on <http://fiu.sona-systems.com/>. For participating in this study you will receive 1 hour of credit. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or Florida International University. There will be no negative consequences for deciding not to participate or for withdrawing. If you choose to not participate in this study, you may satisfy your course requirements through other studies registered with the FIU Psychology Participant Pool at <http://fiu.sona-systems.com/>, or you may contact the Principal Investigator at rachel.york@fiu.edu and receive an alternative method of obtaining credit. Participation in human subjects research is not required to earn credit in any class, and your professor is required to offer an alternative method of obtaining credit.

Questions: You may ask questions of the researcher and have those questions answered, before agreeing to participate or during the research. You may call or email the researcher at any time at the number or email address listed below. Any information provided when contacting or communicating with the researchers will be kept strictly confidential. You are not required to provide any identifying information when communicating with the researcher. You may use the random number given to you at the bottom of this page for communication purposes. If you have any questions about your rights as a research participant, you may contact the chair of the Florida International University Institutional Review Board, Dr. Patricia Price, at 305-348-2618 or 305-348-2494.

Name, Phone Number, and Email Address of Principal Investigator:

Rachel York (305) 348-7157 rachel.york@fiu.edu

To continue, click on the button below. By clicking on the link below and beginning the study, you are consenting to participate. Some pages may take some time to load. Please be patient.

PARTICIPATION IN THIS STUDY REQUIRES YOU TO READ ALL OF THE FOLLOWING MATERIAL CAREFULLY AND COMPLETELY AND RESPOND SINCERELY TO THE QUESTIONS ASKED.

****IMPORTANT: You must use Internet Explorer to complete this online experiment. The webpages may not function properly with other web browsers, such as Mozilla Firefox, etc.****

This identification number-- --is a random number generated by the server that you may use to communicate with the researcher if you wish (for example if there is a problem with the Web pages, or if you have any questions, and do not wish to be identified).

[CLICK HERE TO BEGIN](#)

Appendix B

OPINION STUDY

Introduction

Thank you for your participation in this opinion study today. First, you will read a summary of a case involving a railroad company and their operations on a dangerous section of track. Please take as much time as you need to review the information presented before moving on to the next page, where you will be asked for your opinions about the case.

This case is fictional, including the geographical and company names. It is, however, similar to some real incidents. If it reminds you of something, please try to ignore your recollections and focus on the facts you receive here.

PLAINTIFF: DURANGO RIVER FISH HATCHERY

v.

DEFENDANT: CHICAGO WESTERN RAILROAD

The plaintiff, Durango River Fish Hatchery, alleges that the defendant, Chicago Western Railroad, was negligent in its actions with regard to one of its trains, which traveled was scheduled to travel a dangerous section of track that included a bridge over the Durango River, where the plaintiff's fish hatchery was located, on September 17, 2006/2007. Specifically, the plaintiff claims that Chicago Western negligently and irresponsibly loaded a tank car containing a potentially hazardous herbicide (weed killer) onto this particular train, which traveled was to travel the specified section of track over the Durango River and the hatchery on the day in question.

Summary of Events

On the night of September 17, 2006/2007, a long Chicago Western freight train, 97 cars and four locomotives, was climbing set to climb a steep grade and going around a sharp turn that included a bridge over the Durango River. As the lead part of the train crossed the river, one of the four locomotives and the first six cars derailed. The train had almost made it safely up the steep incline and around the sharp turn when one of the four locomotives and the first six cars derailed. One of the cars was a tank car carrying 19,000 gallons of concentrated metam sodium, an herbicide. That car derailed and fell into the Durango river, landing on its side. Rocks in the river punched several holes in the tanker, allowing the herbicide to escape into the river. Over the next several days, the spill made its way down the river. In the water, the metam sodium transformed into several very toxic chemicals. First, those chemicals destroyed a major fish hatchery (specifically, the plaintiff in this case, the Durango River Hatchery), killing the entire stock of

over a million trout in various stages of development, plus millions of eggs. Continuing down the river, it killed wild fish and plant life, and injured animals. Dozens of individuals near the river who breathed the fumes from the herbicide were sent to area hospitals suffering burning eyes and severe nausea.

Investigations by the Nevada Public Utilities Commission and the National Transportation Safety Board found that numerous mistakes by the train operator, Chicago Western Railroad, caused this derailment. Investigations by the Nevada Public Utilities Commission and the National Transportation Safety Board found that the operator of this train, Chicago Western Railroad, had made numerous mistakes in its operations leading up to this particular train's scheduled passage over the specified section of track.

Cause of Train Derailments – "Stringlining"

When a train goes around a curve, there is a tendency for the railroad cars to be pulled sideways off the track. As you can see in Figure 1, this happens because the force that is pulling the train forward, called the drawbar force, creates a lateral force acting crossways to the track.

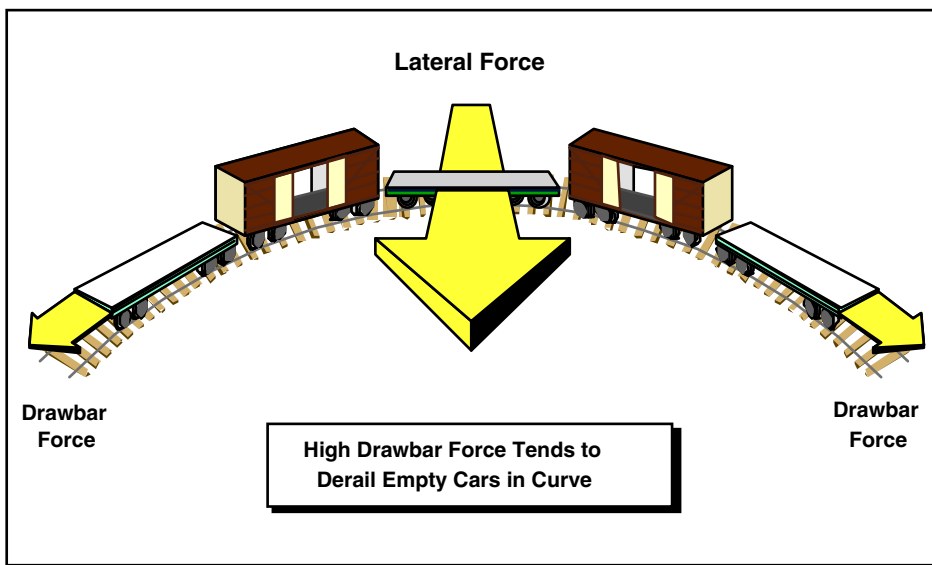


Figure 1

Every railroader knows about this tendency for a train to derail in a curve. They call it "stringlining." Many factors determine whether cars will stay on the track rather than being pulled off. It was a combination of these factors, all of them within the control of Chicago Western personnel, that led to the derailment and the spill of 19,000 gallons of metam sodium into the Durango River. The combination of factors operating on the train scheduled to travel this section of track on September 17, 2006/2007, all within the control of Chicago Western personnel, made the derailment of that train highly likely.

Dangerous Location

This derailment occurred at This train was scheduled to travel on a section of track which is one of the most dangerous in Nevada. It is a sharp curve in an uphill section and was known to Chicago Western to have a high frequency of derailments. In fact, in the eight years prior to the date in question, there had been 14 derailments in this vicinity. The danger is increased by the location of this curve, crossing a bridge over the

Durango River. A derailment can lead to cars tumbling off the track and into the river gorge, as occurred on September 17, 2006..

Barring other contributing factors, trains could and did negotiate this section safely. However, Chicago Western made a number of mistakes that combined to cause this accident. combine to make an accident very probable.

Arrangement of Loaded and Empty Cars

Railroaders know that the most important way to control stringlining and keep it from derailing a train is to properly arrange empty and loaded cars. The fundamental and well known practice in train make-up is that loaded cars go up front, followed by empty ones. The Chicago Western train that derailed was scheduled to travel on September 17, 20062007 was made up of four locomotives and 97 freight cars. Of the 97 freight cars, 86 were empty and 11 were loaded. However, Chicago Western personnel had placed four empty cars first behind the four locomotives. Chicago Western had in fact followed this well known practice on the day in question and had placed the 11 loaded cars first behind the four locomotives, followed by the 86 empty cars. The first loaded car was a tank car containing metam sodium. The accident involved the derailment of the fourth locomotive and the six cars following it, including the tank car.

Long Car/Short Car Combination

Another factor that must be considered when making up trains is placement of long and short cars. As is well known to railroaders, and is illustrated in Figure 2, differences in car lengths cause an increase in lateral force. To keep this from causing derailments, longer cars should be put near the end of the train. However, the tank car that Chicago Western personnel had placed near the front of the train was 52 feet long and right in front of it was a longer flat car, about 80 feet long. An expert in the trial said that this long car was probably the first to derail. Again, Chicago Western had followed the normal protocol on the day in question and placed the longer cars at the end of the train, with the shorter cars at the front, behind the locomotives.

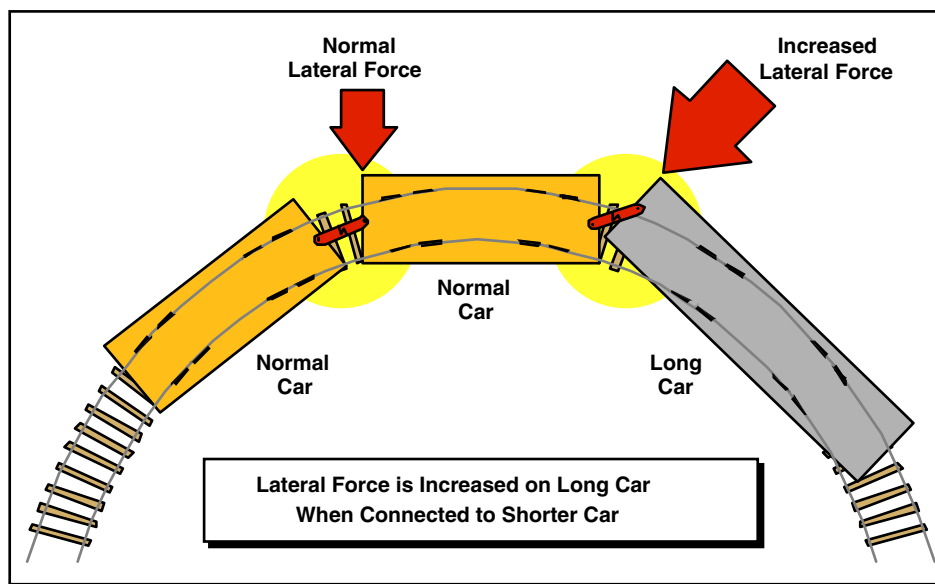


Figure 2

Estimated L/V at the Time of the Accident in Question

An expert on railroad derailment studied the conditions under which the Chicago Western train was operating set to operate on September 17, 2006/2007 and presented his findings at trial. The illustration in Figure 3 shows why the best indicator of likely derailment is the ratio of lateral to vertical force, L/V ("L over V"). If L/V gets above 0.8, the wheels will likely jump the track. The expert's analysis of the combined effects of the sharp curve, the steep grade and steep grade the train was supposed to travel, the positions of loaded and empty cars behind the locomotives, the positions of short and long cars, and the train's likely speed and acceleration rate, gave an L/V ratio of at least 1.3, more than 50% over the limit.

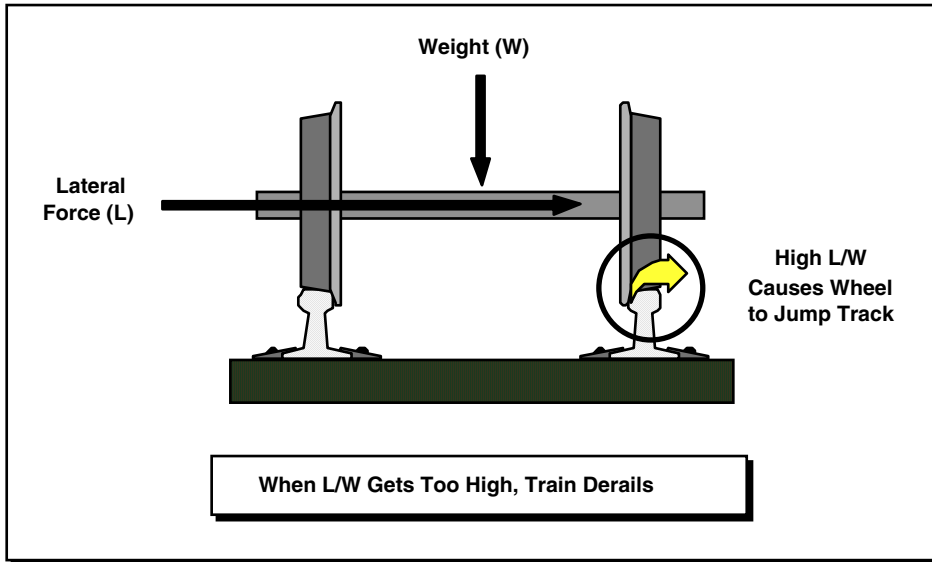


Figure 3

The photograph in Figure 4 clearly shows the tank car, on its side in the river. It also portrays the sharpness of the curve and the how the stringlining pulled the cars inward, toward the inside of the curve.



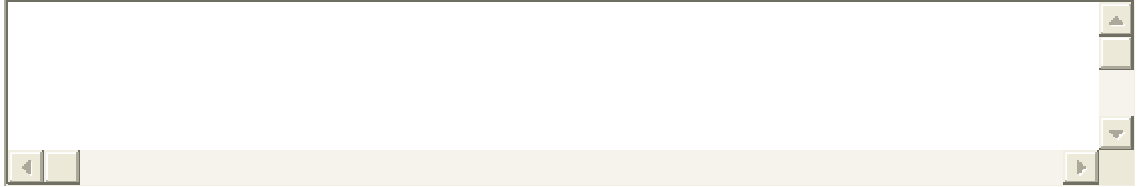
Figure 4

Likelihood of a Serious Accident

Another expert on train derailment testified to the likelihood of an accident causing serious damage to the environment surrounding this section of track, specifically the Durango River below and the fish hatchery that operated there. This expert testified that out of the 97 cars on this train, it was highly unlikely truly an improbable event that the tank car containing metam sodium would derail and end up derailed and ended up in the river below. Furthermore, even if the train had derailed and the tank car had fallen on the ground next to the track, even if it had ruptured, which it probably would not have, there would have been release of an herbicide on the ground and the impact would have been very limited. A spill on the ground would have affected only local vegetation. Derailments do occur from time to time. They would be very expensive to completely prevent; but the consequence is almost always limited.

Fill in the blank:

The train derailment and herbicide spill into the river below would not have happened if only: Chicago Western and other railroads can avoid train derailments that cause serious harm to the surrounding environment if only:



[Click here to continue](#)

Appendix C

Please carefully and thoughtfully answer the following questions:

Before the accident occurred, was there a grave danger or risk of harm that was a foreseeable and probable effect of the operations of Chicago Western Railroad in regards to the train that traveled scheduled to travel over the specified section of track on September 17, 2006/2007?

Not at all				Somewhat	Certainly			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Estimate the probability that a serious accident would have resulted from Chicago Western's actions on September 17, 2007 had the train you read about actually traveled the specified section of track on a scale from 0% - 100%. Ignoring what you now know about the train derailment and herbicide spill, what probability would you have estimated for a serious accident resulting from Chicago Western's actions on September 17, 2006 with regard to the train you read about on a scale from 0% - 100%?

 %

****Carefully READ THE FOLLOWING legal instructions before answering the question below:**

In a civil case such as this one, the burden of proof is on the plaintiff to establish its case by a preponderance of the evidence. When I say that the plaintiff has the burden of proof, I mean that the evidence must satisfy you that the proposition on which the plaintiff has the burden of proof has been established by evidence which outweighs the evidence against it. Proof by a preponderance of the evidence means proof that something is more likely than not. It means that certain evidence, when compared to the evidence opposed to it, has the more convincing force and makes you believe that something is more likely true than not. If the plaintiff fails to meet its burden of proof or if the evidence weighs so evenly that you are unable to say that there is a preponderance on either side, you must resolve the question against the party who has the burden of proof in favor of the opposing party.

The plaintiff, Durango River Hatchery, claims that the defendant, Chicago Western Railroad, was negligent. Negligence is the lack of ordinary care; that is, the failure to do an act which a reasonably careful and prudent person would do, or the doing of an act which a reasonably careful and prudent person would not do, under the same or similar circumstances to protect others from injury or harm. A defendant is negligent if it fails to use a reasonable amount of care, skill and diligence that a reasonably careful person would use in similar circumstances to avoid exposing others to a foreseeable risk of harm. In determining whether the defendant used reasonable care, you should balance what the defendant knew or should have known about the likelihood and severity of potential harm resulting from its actions against the burden of taking other actions to reduce or avoid the harm. A defendant must reasonably anticipate the foreseeable risks of harm that may result from its actions.

To prove that the defendant, Chicago Western Railroad, was negligent, the plaintiff, Durango River Hatchery, must prove by a preponderance of the evidence that the defendant failed to use reasonable care, skill, and diligence in its actions. and that this breach of duty was a legal cause of the plaintiff's harm or loss.

Do you find from a preponderance of the evidence that Chicago Western Railroad was negligent in its actions on September 17, 2006/2007 with regard to the train that was scheduled to travel the specified section of track that evening/that derailed on the specified section of track that evening?

- No, Chicago Western Railroad was not negligent.
- Yes, Chicago Western Railroad was negligent.

If the train described in the summary you just read had actually traveled the specified section of track and derailed, spilling the herbicide one of its tank cars was carrying into the Durango River below the bridge, how much, on a scale from 0% - 100%, would you say that Chicago Western Railroad's actions on September 17, 2007 with regard to that train contributed to the derailment and herbicide spill? In other words, on a scale from 0% - 100%, how causal of the hypothetical train derailment and herbicide spill would Chicago Western Railroad's actions have been? On a scale from 0% - 100%, how much would you say that Chicago Western Railroad's actions on September 17, 2006 with regard to the train you just read about contributed to the train derailment and herbicide spill into the river? In other words, on a scale from 0% - 100%, how causal of the train derailment and herbicide spill were Chicago Western Railroad's actions?

%

The situation in which Chicago Western Railroad found itself in the case summary I just read is relevant to a situation I have found myself in the past or may find myself in the future.

Strongly Disagree						Strongly Agree			
1	2	3	4	5	6	7	8	9	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How much did you think about the following while reading and making judgments about the case summary?

What I would have thought if I were in the position of Chicago Western Railroad.

Not at all					Somewhat	A lot			
1	2	3	4	5	6	7	8	9	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How I would have felt if I were in the position of Chicago Western Railroad.

Not at all					Somewhat	A lot			
1	2	3	4	5	6	7	8	9	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

What I would have done if I were in the position of Chicago Western Railroad.

Not at all					Somewhat	A lot			
1	2	3	4	5	6	7	8	9	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Submit

Appendix D

Please answer the following questions about yourself:

Gender		Ethnic Background		Marital Status	
<input type="checkbox"/>	Male	<input type="checkbox"/>	Caucasian	<input type="checkbox"/>	Single
<input type="checkbox"/>	Female	<input type="checkbox"/>	African-American	<input type="checkbox"/>	Married
Age		<input type="checkbox"/>	Asian	<input type="checkbox"/>	Divorced
<input type="checkbox"/>	18-21	<input type="checkbox"/>	American Indian	<input type="checkbox"/>	Other
<input type="checkbox"/>	22-25	<input type="checkbox"/>	Hispanic/Latin American		
<input type="checkbox"/>	26-30	<input type="checkbox"/>	Other		
<input type="checkbox"/>	31-40	<input type="checkbox"/> I prefer not to answer			
<input type="checkbox"/>	41-50				
<input type="checkbox"/>	Over 50				
Political Orientation		Family Annual Income		Education	
<input type="checkbox"/>	Very conservative	<input type="checkbox"/>	Under \$10,000	<input type="checkbox"/>	Didn't finish high school
<input type="checkbox"/>	Somewhat conservative	<input type="checkbox"/>	\$10,000 to \$20,000	<input type="checkbox"/>	Graduated high school
<input type="checkbox"/>	Somewhat liberal	<input type="checkbox"/>	\$20,000 to \$40,000	<input type="checkbox"/>	Some college
<input type="checkbox"/>	Very liberal	<input type="checkbox"/>	\$40,000 to \$60,000	<input type="checkbox"/>	Graduated college
<input type="checkbox"/>	Unsure	<input type="checkbox"/>	\$60,000 to \$80,000	<input type="checkbox"/>	Graduate training
		<input type="checkbox"/>	Over \$80,000		
		<input type="checkbox"/>	I prefer not to answer		

Is English your first language?		How would you describe your skill with the English language?	
<input type="checkbox"/>	Yes	<input type="checkbox"/>	Excellent
<input type="checkbox"/>	No	<input type="checkbox"/>	Very Good
<input type="checkbox"/>	Prefer not to answer	<input type="checkbox"/>	Good
		<input type="checkbox"/>	Fair
		<input type="checkbox"/>	Poor
		<input type="checkbox"/>	Very Poor
		<input type="checkbox"/>	Prefer not to answer

Are you a U.S. citizen?		Are you registered to vote or do you have a driver's license?	
<input type="checkbox"/>	Yes	<input type="checkbox"/>	Yes
<input type="checkbox"/>	No	<input type="checkbox"/>	No
<input type="checkbox"/>	Prefer not to answer	<input type="checkbox"/>	Prefer not to answer

Please provide your name and Panther ID number so we can give you credit for your participation.

Name:	<input type="text"/>
Panther ID #:	<input type="text"/>

Appendix E



Thank you for your participation in our study. Please read the debriefing material below.

Debriefing Material

The purpose of this research is to investigate the cognitive processes that underlie jurors' decision making. While jurors are supposed to follow the judge's instructions as to the relevant law when reaching legal decisions, much psycholegal research has demonstrated that jurors often consider extralegal factors and fall prey to the same decision-making heuristics employed by laypersons when rendering judgments (Colwell, 2005). Two of these heuristics are counterfactual thinking (Klauer & Migulla, 1995; Roese, 1997; Roese & Olson, 1995, 1997; Sanna & Turley, 1996; Wells & Gavanski, 1989) and the hindsight bias (Christensen-Szalanski & Willham, 1991; Fischhoff, 1975; Guilbault, Bryant, Brockway, & Posavac, 2004; Hawkins & Hastie, 1990). While many researchers have examined these two phenomena independently in the context of legal decision-making, relatively little research has sought to integrate the effects of counterfactuals and hindsight on the same judgment. Thus, the current research seeks to explore how counterfactual thinking and the hindsight bias may interact to affect jurors' decisions in a civil negligence case.

If you have questions regarding this study you may [email the researchers here](#).

Again, thank you very much for your participation in this study.

[Click here to Submit Information and Leave the Experiment](#)

Appendix F

OPINION STUDY

Introduction

Thank you for your participation in this opinion study today. First, you will read a summary of a case involving a railroad company and their operations on a dangerous section of track. Please take as much time as you need to review the information presented before moving on to the next page, where you will be asked for your opinions about the case.

This case is fictional, including the geographical and company names. It is, however, similar to some real incidents. If it reminds you of something, please try to ignore your recollections and focus on the facts you receive here.

PLAINTIFF: DURANGO RIVER FISH HATCHERY

v.

DEFENDANT: CHICAGO WESTERN RAILROAD

The plaintiff, Durango River Fish Hatchery, alleges that the defendant, Chicago Western Railroad, was negligent in its actions with regard to one of its trains, which traveled was scheduled to travel a dangerous section of track that included a bridge over the Durango River, where the plaintiff's fish hatchery was located, on September 17, 2006/2007. Specifically, the plaintiff claims that Chicago Western negligently and irresponsibly loaded a tank car containing a potentially hazardous herbicide (weed killer) onto this particular train, which traveled was to travel the specified section of track over the Durango River and the hatchery on the day in question. **As you read the following summary, try to put yourself in the shoes of the defendant, Chicago Western Railroad. Specifically, think about what you would have thought, felt, or done had you found yourself in the same or similar situation as that described below. Putting yourself in Chicago Western's shoes, take into account your own reactions (i.e., thoughts, feelings, and what you would have done in this situation) when providing your opinions and making judgments about the case.**

Summary of Events

On the night of September 17, 2006/2007, a long Chicago Western freight train was climbing set to climb a steep grade and going around a sharp turn that included a bridge over the Durango River. As the lead part of the train crossed the river, one of the four locomotives and the first six cars derailed. The train was made up of four locomotives and 97 freight cars. Of the 97 freight cars, 86 were empty and 11 were loaded. It was normal for a train to be made up of so many empty freight cars, and similarly long and largely empty

Chicago Western trains had made many trips over this section of track in the past, so this scheduled trip was no exception to the norm. It was not normal for a train to be made up of so many empty freight cars, and similarly long and largely empty Chicago Western trains had not made many trips over this section of track in the past, so this scheduled trip was an exception to the norm. One of the train's cars was a tank car carrying 19,000 gallons of concentrated metam sodium, an herbicide. That car derailed and fell into the Durango river, landing on its side. Rocks in the river punched several holes in the tanker, allowing the herbicide to escape into the river. Over the next several days, the spill made its way down the river. In the water, the metam sodium transformed into several very toxic chemicals. First, those chemicals destroyed a major fish hatchery (specifically, the plaintiff in this case, the Durango River Hatchery), killing the entire stock of over a million trout in various stages of development, plus millions of eggs. Continuing down the river, it killed wild fish and plant life, and injured animals. Dozens of individuals near the river who breathed the fumes from the herbicide were sent to area hospitals suffering burning eyes and severe nausea.

Investigations by the Nevada Public Utilities Commission and the National Transportation Safety Board found that numerous mistakes by the train operator, Chicago Western Railroad, caused this derailment. Investigations by the Nevada Public Utilities Commission and the National Transportation Safety Board found that the operator of this train, Chicago Western Railroad, had made numerous mistakes in its operations leading up to this particular train's scheduled passage over the specified section of track.

Cause of Train Derailments – "Stringlining"

When a train goes around a curve, there is a tendency for the railroad cars to be pulled sideways off the track. As you can see in Figure 1, this happens because the force that is pulling the train forward, called the drawbar force, creates a lateral force acting crossways to the track.

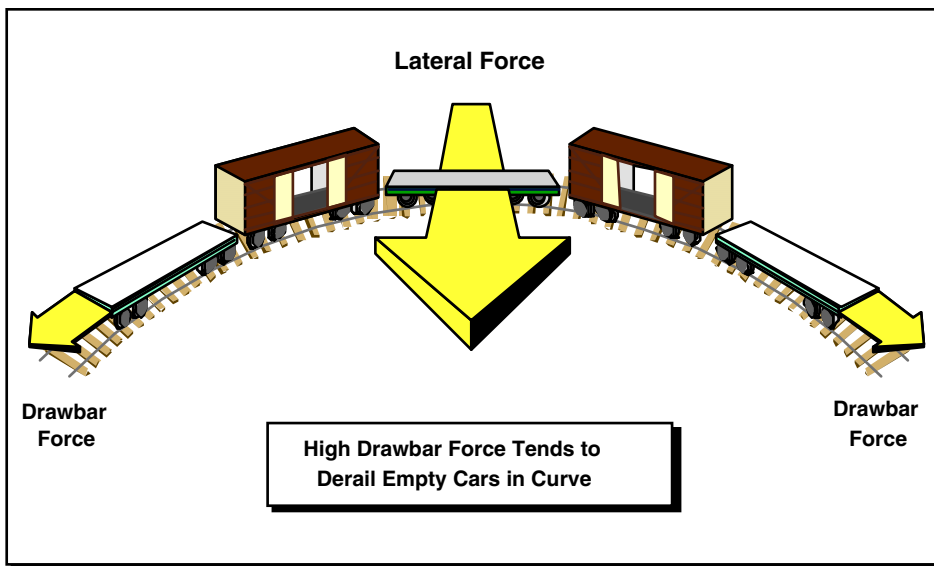


Figure 1

Every railroader knows about this tendency for a train to derail in a curve. They call it "stringlining." Many factors determine whether cars will stay on the track rather than being pulled off. It was a combination of these factors, all of them within the control of Chicago Western personnel, that led to the derailment and the spill of 19,000 gallons of metam sodium into the Durango River. The combination of factors operating

on the train scheduled to travel this section of track on September 17, 2007, all within the control of Chicago Western personnel, made the derailment of that train highly likely.

Dangerous Location

This derailment occurred at This train was scheduled to travel on a section of track which is one of the most dangerous in Nevada. It is a sharp curve in an uphill section and was known to Chicago Western to have a high frequency of derailments. In fact, in the eight years prior to the date in question, there had been 14 derailments in this vicinity. The danger is increased by the location of this curve, crossing a bridge over the Durango River. A derailment can lead to cars tumbling off the track and into the river gorge, as occurred on September 17, 2006..

Barring other contributing factors, trains could and did negotiate this section safely. However, Chicago Western made a number of mistakes that combined to cause this accident.combined to make an accident very probable.

Estimated L/W at the Time of the Accident in Question

An expert on railroad derailment studied the conditions under which the Chicago Western train was operatingset to operate on September 17, 20062007 and presented his findings at trial. The illustration in Figure 3 shows why the best indicator of likely derailment is the ratio of lateral force to vertical force, or weight: L/W ("L over W"). If L/W gets above 0.8, the wheels will likely jump the track. The expert's analysis of the combined effects of the sharp curve, the steep grade and steep grade the train was supposed to travel, and the train's likely speed and acceleration rate, gave an L/W ratio of at least 1.3, more than 50% over the limit.

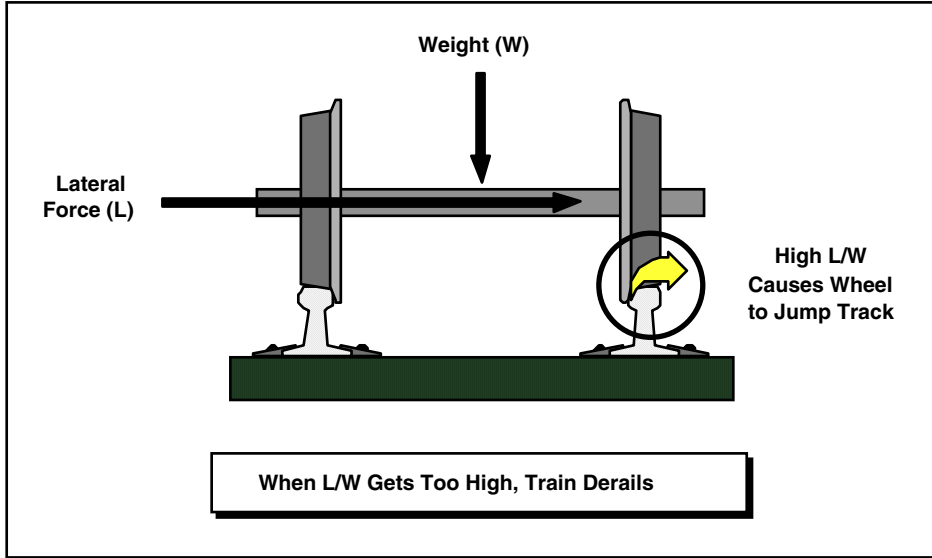


Figure 3

The photograph in Figure 4 clearly shows the tank car, on its side in the river. It also portrays the sharpness of the curve and the how the stringlining pulled the cars inward, toward the inside of the curve.



Figure 4

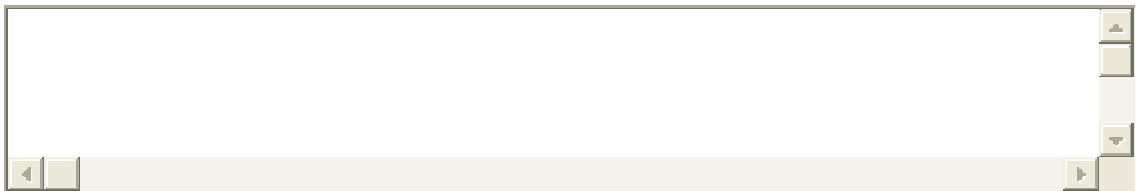
Likelihood of a Serious Accident

Another expert on train derailment testified to the likelihood of an accident causing serious damage to the environment surrounding this section of track, specifically the Durango River below and the fish hatchery that operated there. This expert testified that out of the 97 cars on this train, it was highly unlikely truly an improbable event that the tank car containing metam sodium would derail and end up derailed and ended up in the river below. Furthermore, even if the train had derailed and the tank car had fallen on the ground next to the track, even if it had ruptured, which it probably would not have, there would have been release of an herbicide on the ground and the impact would have been very limited. A spill on the ground would have affected only local vegetation. Derailments do occur from time to time. They would be very expensive to completely prevent; but the consequence is almost always limited.

As you are answering the questions that follow on this page and the next page, try to put yourself in the shoes of the defendant, Chicago Western Railroad. Specifically, think about what you would have thought, felt, or done had you found yourself in the same or similar situation as that described above. Putting yourself in Chicago Western's shoes, take into account your own reactions (i.e., thoughts, feelings, and what you would have done in this situation) when providing your opinions and making judgments about the case.

Fill in the blank:

The train derailment and herbicide spill into the river below would not have happened if only: Chicago Western and other railroads can avoid train derailments that cause serious harm to the surrounding environment if only:



[Click here to continue](#)

Appendix G

[Foresight Conditions]

Please CAREFULLY and THOROUGHLY read the following material:

As you read the following material, try to put yourself in the shoes of the Chairperson of the City of Duluth's Urban Planning Commission. Specifically, think about what you would have thought, felt, or done had you found yourself in the same or similar situation as that described below. Putting yourself in the Chairperson's shoes, take into account your own reactions (i.e., thoughts, feelings, and what you would have done in this situation) when making judgments and providing answers to the questions that follow.

Notes from an administrative meeting of the City of Duluth Urban Planning Commission

SECRETARY: This meeting of the Duluth Urban Planning Commission is now in session, Chairman Smith presiding.

CHAIR: Before we proceed, I would like to give instructions. Our committee exists to make important decisions regarding city planning. You are the third auxiliary member of our committee. You are only voting today because the committee is deadlocked on the issue at hand.

First, let me give you an abbreviated version of the situation. Last May, the City of Duluth completed construction of a drawbridge across the mouth of the Miniwapa River. The Miniwapa River sees a considerable amount of commercial traffic during the summer and early fall from many upstream businesses. During the Months of December through April, however, the river is usually frozen. Hence, there is no commerce on the waterway in the winter. During the active months, the City maintains a bridge operator 24 hours a day, seven days a week, so that the bridge can be lowered or raised at any time. The City presently is deciding whether or not to employ a bridge operator during the winter months.

[One Intermediate Event Condition]

The City's Disaster Preparedness Committee has alerted us to the fact that some possibility of winter and spring flooding exists as a result of the new bridge. Specifically, warm weather could cause the normally frozen Miniwapa River to thaw. When it thaws, the river approaches flood stages and turns into a violent torrent, filled with ice floes. It is possible that the river could crest at eighteen feet or higher, less than two feet below the bottom of the new bridge. If this were to occur, large chunks of loose ice floating down the river could lodge under the bridge and create a temporary dam, blocking the flow of water under the bridge. A potential backlog like this could result in the river flooding upstream before the drawbridge could be raised. A flood would be a terrible event, potentially causing severe damage to property along the bank of the river. Employing a bridge operator during the winter and spring would alleviate this threat, but is fairly costly. The decision as to whether or not the city should hire an operator is the decision that is in

question here today. I am torn between the two options. But two other members of our Committee, Ms. Sugal and Mr. Markwell, have chosen sides and we will hear from a series of visitors to help you make your decision. My ambivalence arises from the uncertainty associated with the probability of a flood occurring. I would like you to review the available testimony to determine how likely it is that a flood will occur during the winter months. Ms. Sugal, Mr. Markwell, do you have anything to add?

[Three Intermediate Events Condition]

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[Five Intermediate Events Condition]

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MS. SUGAL: Basically, I believe that the city should employ a bridge operator throughout the winter months. The operator would be necessary to prevent accidents such as collisions and floods from occurring. Today we will hear testimony from a City disaster planner which shows that the City should consider employing a bridge operator during the winter. We will hear testimony from a meteorological expert who will tell us the Miniwapa River runs high every spring. In short, the evidence will show that a flood is a foreseeable event and that the City should take precautions to avoid such a disaster.

MR. MARKWELL: Today we will hear testimony from several experts that an accident involving the bridge would be a freak occurrence. We will hear testimony from the City planners in charge of the bridge who will tell us that they considered the possibility of such an accident. These conscientious people will testify as to why they decided that this type of accident was a highly improbable event. After you hear how an accident might occur, and the unlikely events that would have to take place for it to occur, you will agree that the City should not employ a bridge operator during the winter. In short, after reviewing all the facts, I firmly believe that an accident like a flood is so unlikely that it cannot possibly justify the expense of employing a bridge operator throughout the winter.

CHAIR: Thank you. Can we have our first visitor's opinion.

SECRETARY: Yes, Chairman. We have Dr. Richard Harris.

MS. SUGAL: Dr. Harris, what is your occupation?

HARRIS: I am a meteorologist. I work for the National Weather Service.

MS. SUGAL: What are your qualifications and education?

HARRIS: I have a Ph.d in meteorology from the University of Minnesota. And I have been working for the weather service for twelve years as an analyst.

MS. SUGAL: What, specifically, do you do for the Weather Service?

HARRIS: I analyze data on rainfall in the Greater Duluth Area.

MS. SUGAL: Could you elaborate please?

HARRIS: Yes. I look for patterns of rainfall during the year throughout the area. We use this data to predict rainfall during each season of each year. We give this information to area farmers and construction planners. The farmers use the data to determine which crops to plant at which times. The planners use it to determine possible flood sites.

MS. SUGAL: What can you tell us about the Miniwapa River?

HARRIS: Each year, we analyze rainfall in that area, and predict flooding levels of the River. The river rises dramatically each spring.

MS. SUGAL: Could you be more specific about how much the river rises?

HARRIS: Yes. We have been monitoring flood levels during the spring for each of the past sixty years. During the summer, the river runs at about eight to ten feet deep near the mouth, and rises to between ten and twelve feet during the fall. It varies greatly in the Spring.

MS. SUGAL: Tell us more about the spring floods?

HARRIS: Well, in the past sixty years, the river has risen as high as 21 feet, and it crests over 15 feet at least once each year.

MS. SUGAL: What do you mean by at least once?

HARRIS: Well, the river can flood multiple times in a single year. Sometimes we get an early thaw, and the river will flood and then freeze again when the temperature drops. Basically, it rises rapidly when the snow starts to melt.

MS. SUGAL: Can you predict how much the river rises?

HARRIS: Not very well, I'm afraid. How much it rises depends on how much snow there is and how rapidly the temperature rises. Lots of snow and a rapid increase in temperature can generate a lot of water. But if we have a mild winter that warms up gradually, it won't rise very much.

MS. SUGAL: Dr. Harris, you said the river has reached as high as 21 feet, how often has that happened in the past sixty years?

HARRIS: Well, it only got that high twice, and that was only near the mouth, where the bridge is. That was in 1956 and 1965.

MS. SUGAL: How many times has the river crested above 20 feet?

HARRIS: May I consult my notes?

MS. SUGAL: Certainly. But regarding these notes, Dr. Harris, can you tell us what they are?

HARRIS: This is a memorandum describing how frequently the Miniwapa River has risen above 18 feet in the past 60 years.

CHAIR: You may refer to this memo, Dr. Harris, but we will need a copy to put into the permanent record. If the secretary could prepare copies for the committee, this memo is hereby labeled as "Exhibit A" of these proceedings.

Please Read Exhibit A Now Before Proceeding

Exhibit A

TO: Joseph Bosniak, Director, Northern Minnesota Div., National Weather Service

FROM: Richard Harris

RE: Flood Level of Miniwapa River

DATE: August 15, 1987

As per your request, I have reviewed the data on high water levels of the Miniwapa River. Data was available from 1931. During that time, the water level has been stable at between 10 and 12 feet during every season except spring, when it generally rises to between 12 and 15 feet. It has crested higher than 18 feet on 14 occasions since 1931.

These are listed below:

03/14/35- 18 feet

03/17/35- 18 feet

02/28/43- 19 feet

03/16/43- 19 feet

01/31/56- 21 feet

02/27/56- 18 feet

03/14/56- 19 feet

03/15/56- 20 feet

02/25/65- 19 feet
03/03/65- 18 feet
03/15/65- 18 feet
03/27/65- 18 feet
04/02/65- 21 feet

03/21/77- 20 feet

Richard Harris

MS. SUGAL: Now Dr. Harris, when did you write this?

HARRIS: In 1987 -it was a routine memo. I wrote them on many of the area's streams and rivers.

MS. SUGAL: According to your memo, how many times has the river crested above 18 feet in the last 60 years.

HARRIS: 14 times.

MS. SUGAL: Thank you, Dr. Harris.

CHAIR: Does anyone else have any further questions for our visitor?

MR. MARKWELL: Dr. Harris, according to this memo, how often has the river crested above 20 feet?

HARRIS: Four times, twice in 1956, as I mentioned, once in 1965 and once in 1977.

MR. MARKWELL: What stage is considered flood level for this river?

HARRIS: Well, right now the river is flooded if it crests over 22 feet.

MR. MARKWELL: So the river has never flooded, is that correct?

HARRIS: Yes. Well, actually in 1956 and 1965, when it crested at 21 feet, it flooded.

MR. MARKWELL: Excuse me, but how is it that flood stage is 22 feet and it flooded at 21?

HARRIS: Until 1965, the flood stage was 20 feet. Since then, the City and the property owners have built higher embankments to contain the river.

MR. MARKWELL: Getting back to the memo, in how many years has the river crested at least one time above 18 feet.

HARRIS: In 5 years. Twice in 1935, twice in 1943, four times in 1956, five times in 1965, and once in 1977.

MR. MARKWELL: You stated that the river is somewhat unpredictable, but can you use these figures to estimate the odds that in a given year the river crests at over 18 feet.

HARRIS: Well, probably less than one in ten.

MR. MARKWELL: Over twenty feet.

HARRIS: Maybe one in twenty.

MR. MARKWELL: Okay, no further questions.

CHAIR: Dr. Harris, I believe we have heard enough. Thank you for your cooperation. Now I'd like to introduce our next expert, Dave Thomas. Mr. Thomas, what is your occupation.

THOMAS: I am a civil engineer employed by the City Disaster Preparedness Committee. My job is to review each new construction by the City. I look for potential hazards and dangers involved in the new construction. My job is basically to figure out possible disasters that others may miss. According to the laws of the City of Duluth, we are to prepare a report, in the form of a memorandum, on each and every new construction undertaken by the City.

MS. SUGAL: Have we received such a memorandum in connection with the Miniwapa Bridge?

THOMAS: Yes.

MS. SUGAL: Is this a copy of that memo?

THOMAS: Yes it is.

CHAIR: Mr. Thomas, we have entered this memo into the permanent record of these proceedings as "Exhibit B". The secretary will please prepare copies for the full committee.

Please Read Exhibit B Now Before Proceeding

Exhibit B

TO: City of Duluth Urban Planning Commission

FROM: City of Duluth Disaster Preparedness Commission

RE: Drawbridge Over Miniwapa River

DATE: May 27, 1988

In accordance with our task of assessing possible hazards resulting from new City sponsored construction, this Commission has analyzed the new bridge, recently completed over the Miniwapa River. This bridge is a drawbridge which can be raised and lowered to permit river traffic to pass underneath, when necessary. In analyzing possible disasters resulting from this bridge we have assessed disasters of three possible sources: automobile accidents, barge traffic accidents and flooding. With regards to automobile hazards, this Commission finds that the traffic signals placed on either side of the structure are adequate to prevent serious risk of vehicular accidents. Before the bridge can be raised, the bridge operator must activate red lights on either side of the bridge, and lower two gates on either side. Drivers have the benefit of seeing a red light and a lowered gate to prevent them from attempting to drive on the bridge while it is raised. Furthermore, the bridge is designed so that it cannot be raised while a vehicle of significant weight (any sized car or more) is on the bridge. This bridge conforms to acceptable traffic safety standards and city construction codes #4-4172 and #5-4086. We recommend that a regular inspection routine be set up to ensure that the traffic lights and gate are in proper working order. With regards to hazards from river traffic, this Commission considered the possibility of boats or barges colliding with the bridge. This type of accident should not occur as long as a bridge operator is in place. A collision between boats and the bridge can easily be prevented by instructing bridge operators to raise the bridge whenever river traffic is approaching. To ensure that no accidents occur, the Commission recommends that the City give careful training to its bridge operators. Finally, the Commission has considered the possibility of flooding from the Miniwapa River. In the winter months, the river freezes and sometimes thaws. During such thaws, the river has been know to crest at 17 or 18 feet. The river is not used for traffic during the winter months, since it is either frozen or flooded in the months of December through April. During the thaws, the river is filled with large, fast-moving pieces of ice. The Commission is concerned that at extremely high levels of flooding, ice on the river could collide with the bridge, causing damage to it. Also, if enough ice should be dammed up by the bridge, it could create a backlog and force the river above its flood level. Such a flood would overspill onto the flood plain of the river, which is occupied by a commercial bakery and a city park. While damage to the park could be minor, the bakery could sustain severe damage. The Commission is unaware of the likelihood that such a problem could occur. The river itself would have to crest at 21 feet to come up to the bottom of the bridge. Ice in the river could hit the bridge if the river were two or three feet lower than this. Although the Commission is aware that the river has reached 18 feet in the past, it is unaware of how likely a crest of 18 or 19 feet might be. The Commission recommends that the Urban Planning Commission investigate this possibility and consider employing a bridge operator full time in the winter.

Steve O'Neill
Chair

Dave Thomas
Assistant

Irene Labenski
Assistant

MS. SUGAL: Mr. Thomas, is your committee concerned about any possible flooding which could result from the recent construction of the bridge?

THOMAS: Yes. As it says in the last paragraph, we know that the river has crested very close to the height of the bridge.

MS. SUGAL: How high is the bridge?

THOMAS: The bottom of it is about twenty-one feet above the riverbed.

MS. SUGAL: Should we be concerned about flooding?

THOMAS: When the river thaws, it runs deep and fast. It also fills with ice and debris. We ought to consider the possibility that some of this could get lodged under the bridge causing a backlog and a flood. In this way, the bridge itself might add to the likelihood of a flood since things can get caught under it and essentially create a dam.

MS. SUGAL: So, this memo expresses the concern that debris will lodge under the bridge, correct?

THOMAS: Yes.

MS. SUGAL: What about other things. Do boats often break loose on the river?

THOMAS: It happens. That is why we mentioned it in the memo.

MR. MARKWELL: But it happens in the summer, not the winter, right?

THOMAS: I am only aware of boats breaking loose in the summer.

MR. MARKWELL: Mr. Thomas, to your knowledge, has there ever been a report of a boat breaking loose in the winter?

THOMAS: No.

MR. MARKWELL: Okay, thank you very much. I have no further questions.

CHAIR: Good. I would now like to introduce Ms. Ann Jones. Ms. Jones, what is your occupation?

JONES: I am an employee of the Duluth Urban Planning Commission.

MS. SUGAL: What is your job, specifically?

JONES: Accounting officer. I make property value assessments for the commission.

MS. SUGAL: Have you been involved in the review process regarding the Miniwapa River?

JONES: Yes I have been.

MS. SUGAL: Have you reviewed the memo submitted by Dave Thomas?

JONES: Yes, I did. Four weeks ago.

MS. SUGAL: Did you generate an estimate as to the amount of damage that a flood would cause?

JONES: Yes, approximately one million dollars damage to a local bakery, and a hundred thousand dollars in damage to the bridge itself.

MR. MARKWELL: Have you also made an estimate as to how much a bridge operator will cost the City?

JONES: We estimate that it would cost \$100,000 each year. This would certainly be the least costly and only feasible precaution.

CHAIR: Thank you very much, Ms. Jones. Now I would like to introduce our next visitor, Mr. Steve O'Neill. Mr. O'Neill, what is your occupation?

O'NEILL: I am the chairperson of the City's Disaster Preparedness Commission.

MR. MARKWELL: What does your Commission do?

O'NEILL: We review all new constructions for possible hazards and unforeseen dangers.

MR. MARKWELL: Is Mr. Dave Thomas on this committee also?

O'NEILL: Yes, he has been my colleague for several years.

MR. MARKWELL: As you may know, Mr. O'Neill, Mr. Thomas has already spoken with us today. At that time he gave us this memo, labeled Exhibit B. Do you recognize this memo?

O'NEILL: Yes, its the memo we did on the Miniwapa river drawbridge.

MR. MARKWELL: Can you tell us a little about it?

O'NEILL: Well, it was just a routine memo. We can almost always find some potential disaster that nobody else thought of.

MR. MARKWELL: Are you saying then that you weren't really worried about some of the accidents listed in here actually happening?

O'NEILL: Well, that's not really our job. We are concerned with pointing out possible hazards, no matter how remote. It's up to the City to decide what to do about them.

MR. MARKWELL: Do you recall how possible you believed a flood to be?

O'NEILL: Yes, it seemed very unlikely to me.

MR. MARKWELL: Can you tell us a little bit about Mr. Thomas.

O'NEILL: Thomas is very good, but he takes his job to extremes sometimes.

MR. MARKWELL: How so?

O'NEILL: Well, he is very good at dreaming up possible disasters. We sometimes wonder why he isn't afraid of getting out of bed in the morning.

MR. MARKWELL: Thank you, I have no more questions.

MS. SUGAL: Mr. O'Neill, when you described Mr. Thomas as too good at dreaming up disasters, I am a little surprised. Isn't it your job to dream up possible disasters?

O'NEILL: Well, as I said, Mr. Thomas is a good planner, and I respect the job he does. He's an asset to our committee. But he is often too zealous and can hold up projects.

MS. SUGAL: I see. Mr. O'Neill, when you said that you did not believe that an accident would occur, what did you base that on?

O'NEILL: Oh, mostly it's my opinion after reading through the meteorological data.

MS. SUGAL: It's not your job to assess the likelihood of a disaster is it?

O'NEILL: No, just to outline potential hazards.

MS. SUGAL: You don't list outlandish possibilities when writing such a memo do you?

O'NEILL: No, the hazards we list are all potentially very real ones.

MS. SUGAL: So is it safe to say that that because you listed flooding in the memo on the Miniwapa bridge, that such an occurrence is a potential hazard?

O'NEILL: Yes, it is.

MS. SUGAL: So a flood would not be an outlandishly unimaginable freak accident?

O'NEILL: No, it wouldn't be.

MS. SUGAL: Just very unlikely.

O'NEILL: Yes, as I said, it's very unlikely.

MS. SUGAL: I have no further questions.

CHAIR: Mr. O'Neill, you can leave now. Thank you for your time. We now will hear from Mr. George Mahoney. Mr. Mahoney, what is your occupation.

MAHONEY: I have been the city dock inspector for ten years.

MR. MARKWELL: How many boats are usually moored on the river in the Winter?

MAHONEY: Usually about 20 in the winter. Their owners keep them tied up starting in November. Nobody does any shipping on the river in the Winter, because the river's frozen.

MR. MARKWELL: How well are the boats tied?

MAHONEY: Very well. We have to worry about them getting loose when the spring thaw melts the river. It can get pretty rough. Every November, the owners tie up all of their boats securely for the winter. It's my job to double check the moorings.

MR. MARKWELL: So could a boat break loose?

MAHONEY: It's hard to say. It can get pretty rough some winters and sometimes when it thaws quickly, the thaw can loosen the moorings and damage the ropes.

MR. MARKWELL: Wouldn't you have noticed this?

MAHONEY: No. I check the moorings in the spring also, but you wouldn't be able to detect that sort of a problem.

MR. MARKWELL: Why not?

MAHONEY: Well, any damage to the rope caused by the winter would be inside the rope. Also, by loose mooring, I don't mean that you can just move the boat around. These boats weigh several tons, and maybe you or I can't move them, but that doesn't mean that the river can't.

MR. MARKWELL: How long have you worked at the Miniwapa river?

MAHONEY: Ten years, total.

MR. MARKWELL: During that time, have you ever seen boats break loose?

MAHONEY: Sure, a few times.

MR. MARKWELL: During the winter?

MAHONEY: No, I mean during the summer. Everybody ties up their boats tight in the winter. As I said, it can get pretty rough.

MR. MARKWELL: So you have never seen or heard of a boat breaking loose during the winter?

MAHONEY: No, I have not.

MR. MARKWELL: No further questions.

MS. SUGAL: You say that you have never heard of a boat breaking loose on the river during the winter?

MAHONEY: Yes.

MS. SUGAL: Isn't it possible that it has happened in the past and that you have not heard of it?

MAHONEY: It's possible, but if it happened in the last ten years, I would have heard of it.

MS. SUGAL: No further questions.

CHAIR: Mr. Mahoney, you may step down. Any more visitors?

MS. SUGAL: Actually, I would like to have you hear from one final person.

CHAIR: Go ahead.

MS. SUGAL: I'd like to introduce Mr. Martin Davis. Mr. Davis, what do you do?

DAVIS: I've been retired for ten years, but before that I worked as a dock inspector for the City of Duluth.

MS. SUGAL: How long did you do that?

DAVIS: Over forty years.

MS. SUGAL: Mr. Davis, in your experience as a dock inspector, have you ever seen or heard of a boat breaking loose during the winter or spring?

DAVIS: Sure, it happened several times. I remember because losing a boat downstream was a big deal. It would get out into Lake Superior, and then you had to get it back, somehow.

MS. SUGAL: No further questions.

MR. MARKWELL: Mr. Davis, you said that boats broke loose several times, can you be more specific?

DAVIS: Let's see. Four, maybe even five times that I know of.

MR. MARKWELL: Can you tell us in what years these boats broke loose.

DAVIS: Well, in '56 we lost one. And then again in '65. Uh, maybe in 1970 one broke loose from the smelter. I don't remember the rest exactly, but I'm sure it happened more than that.

MR. MARKWELL: No further questions.

CHAIR: You may step down, Mr. Davis. Any more fresh opinions?

MS. SUGAL: No sir.

MR. MARKWELL: Not from me.

CHAIR: Let's proceed then. Do you two have any final arguments for me?

MS. SUGAL: Yes, thank you. All of our visitors from the City's Disaster Committee and Planning Committee have told us that the possibility for an accident exists. We know the river can rise well above 16 feet. We know that it often fills with ice. Boats or debris sometimes float down the river. And now the possibility even exists that something could lodge under the bridge and cause a flood. Dave Thomas has warned us about such a possibility. Mr. Markwell thinks that the risk would not justify the precautions. I think he is wrong.

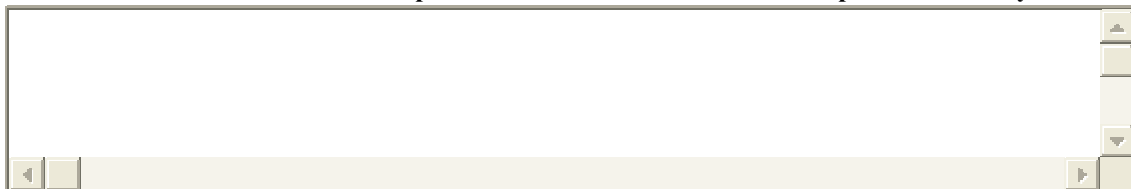
MR. MARKWELL: Thank you. But after going through careful considerations of the potential hazards posed by this new bridge, I think that the City has already taken enough precautions. The City employs people like Dave Thomas and Steve O'Neill, whose sole function is to dream up potential hazards, no matter how unlikely. And make no mistake about it, any accident here would be an unlikely event! We have also been made aware of how much it would cost to eliminate the risk. \$100,000 per year. Every year. If that seems wasteful to you, the commission must decide not to hire such an operator. The City tries hard to eliminate hazards and risks, but it cannot eliminate them all. Thank you.

CHAIR: So, you have heard the evidence and the arguments, and I would now like to give you instructions as to how to decide this issue for us. The City of Duluth, as the trustee of the public welfare of the citizens and residents of the City is bound by law to take all reasonable precautions to avoid hazards and accidents. If the City fails to take all reasonable precautions, then the City is responsible for any consequences of that failure. What that means is that if it is foreseeable that an accident might ensue from the decision not to hire a bridge operator for the winter, then the failure to do so leaves them with full responsibility for an accident.

The law also gives us a clear definition as to which precautions are reasonable, and which are not. In deciding whether the employment of a bridge operator throughout the winter is a reasonable precaution, we must consider the economics of the decision. If the precaution will prevent more harm than its cost, then the City is responsible for not taking the precaution. If, however, the precaution cost more than the harm it would have prevented, then the City is not responsible. When making this determination, you must take into account the probability of an accident occurring.

The task is fairly simple here. The only number missing from our calculation is the probability of a flood. It is your job to supply that number. We know that the damage from a flood would cost \$1,000,000 and that the cost of eliminating the risk of the flood by employing the operator is \$100,000. Therefore, if you find that the probability of a preventable flood each year *exceeds ten percent*, then you must agree with Ms. Sugal that the City should hire an operator. If you find that the probability of a flood is *less than ten percent*, then you must side with Mr. Markwell that an accident is too unlikely to be worth the cost of hiring an operator. You are to fill out this form when deciding the case. The commission thanks you for your participation as an auxiliary member.

Fill in the blank: Floods such as the potential one described above can be prevented if only:



[Click here to continue](#)

[Hindsight Conditions]

Please CAREFULLY and THOROUGHLY read the following material:

As you read the following material, try to put yourself in the shoes of the Chairperson of the City of Duluth's Urban Planning Commission. Specifically, think about what you would have thought, felt, or done had you found yourself in the same or similar situation as that described below. Putting yourself in the Chairperson's shoes, take into account your own reactions (i.e., thoughts, feelings, and what you would have done in this situation) when making judgments and providing answers to the questions that follow.

Continental Bakeries, Inc. v. City of Duluth

BAILIFF: Federal District Court, Seventh Circuit, Northern District of Minnesota, Judge Smith presiding, all rise.

JUDGE: Be Seated. Bailiff, please call the case.

BAILIFF: Continental Bakeries v. City of Duluth

JUDGE: Is the plaintiff ready to proceed?

PLAINTIFF: Yes, your honor.

JUDGE: Defense, are you ready?

DEFENSE: Yes, your honor.

JUDGE: Before we proceed, I would like to give pre-trial instructions to the jury, if there are no objections?

PL/DEF: No objection.

JUDGE: Ladies and gentleman of the jury, before you hear the case I would like to give you special instructions so that the evidence presented to you will be more clear. The parties in this case have been litigating for some time, and in the course of pre-trial activity, have made a number of stipulations and admissions. In a complex case like this one, it is customary for such parties to make many such stipulations, so as to simplify the case at trial. At this time, I would like to go through these admissions.

First, both parties have agreed to let me give you an abbreviated version of the facts which are not in dispute. During May 1988, the City of Duluth completed construction of a drawbridge across the mouth of the Miniwapa River. During the summer and early fall, the Miniwapa River sees a considerable amount of commercial traffic from many upstream businesses. During the months of December through April, the river is usually frozen, and hence, there is no commerce on the waterway. During the active months, the

City maintains a bridge operator 24 hours a day, seven days a week, so that the bridge can be lowered or raised at any time. During the winter, the City decided not to employ a bridge operator. It is this decision that is in contention here today.

[One Intermediate Event Condition]

During the middle of March, 2006, warm weather caused the normally frozen Miniwapa River to thaw. When it thaws, the river approaches flood stages and turns into a violent torrent, filled with ice floes. On the night of March 17, 2006, the river crested at eighteen feet high, only two feet below the bottom of the new bridge. During the course of that night, numerous large chunks of ice lodged under the bridge and created a temporary dam, blocking the flow of water under the bridge. This backlog resulted in the river flooding upstream before the drawbridge could be raised. Had the bridge been raised, it would have freed the ice and prevented the river from flooding. The flood only affected Continental Bakeries' property and a public park owned by the City.

[Three Intermediate Events Condition]

During the middle of March, 2006, warm weather caused the normally frozen Miniwapa River to thaw. When it thaws, the river approaches flood stages and turns into a violent torrent, filled with ice floes. On the night of March 17, 2006, the river crested at eighteen feet high, only two feet below the bottom of the new bridge. While this occurred, some of the large, fast-moving pieces of broken ice pushed powerfully against a barge moored (tied up) at a dock, causing it to break loose upstream. As it forcefully moved downstream with the ice floes pushing it along, the first loose barge collided with a second moored ship, causing it too to come loose and collect more chunks of ice as it moved violently downstream together with the first loose barge. The first loose barge, along with the numerous ice floes it had collected along the way, lodged under the bridge, creating a temporary dam which blocked the flow of water under the bridge. Shortly thereafter, the second loose ship collided with one of the bridge supports, creating even more of a dam than the first lodged barge had caused. This backlog resulted in the river flooding upstream before the drawbridge could be raised. Had the bridge been raised, it would have freed the ships and ice, preventing the river from flooding. The flood only affected Continental Bakeries' property and a public park owned by the City.

[Five Intermediate Events Condition]

During the middle of March, 2006, warm weather caused the normally frozen Miniwapa River to thaw. When it thaws, the river approaches flood stages and turns into a violent torrent, filled with ice floes. On the night of March 17, 2006, the river crested at eighteen feet high, only two feet below the bottom of the new bridge. While this occurred, some of the large, fast-moving pieces of broken ice pushed powerfully against a wooden dock, causing a portion of the dock to collapse. Several large pieces of wood from the broken dock began to travel quickly down the river and collected several ice floes along the way. This large mass of wood and broken ice eventually collided with a barge moored (tied up) at another dock, causing it to break loose upstream. As it forcefully moved downstream with the wood and ice floes pushing it along, the first loose barge collided with a second moored ship, causing it too to come loose and collect more chunks of ice as it moved violently downstream together with the first loose barge. The first loose barge, along with the numerous ice floes it had collected along the way, lodged under the bridge, creating a temporary dam which blocked the flow of water under the bridge. Shortly thereafter, the second loose ship collided with one of the bridge supports. This collision caused serious damage to the structure of

the bridge support, and it could no longer support the weight of the bridge above it. A few minutes later, the support gave way, and the portion of bridge directly above it collapsed into the river, creating even more of a dam than the first lodged barge had caused. The subsequent backlog of water resulted in the river flooding upstream. Had the drawbridge been raised when the loose ships and ice were approaching it, they would never have gotten lodged under or collided with the bridge, preventing the river from flooding. The flood only affected Continental Bakeries' property and a public park owned by the City.

At issue here today is the City's responsibility for the flood. The parties have agreed that the damage caused by the flood is one million dollars. This is not at issue and not for you to decide. What is at issue is whether or not the City must pay Continental Bakeries for this damage. I will provide further instructions for you regarding which factors must be used to determine responsibility after you have heard the evidence.

Are you ready to proceed with your opening arguments, plaintiff?

PLAINTIFF: Yes, thank you your honor. Ladies and gentleman, you have heard the statement of the facts. On the night of March 17, 2006, my client, Continental Bakeries suffered a serious disaster. No one was hurt, fortunately, but the flood did cause one million dollars of damage to my client. The bridge in question was only in operation for 10 months before serving as the key ingredient which allowed a flood to occur. Only two-and-a-half minutes were necessary to raise the bridge and avoid such a flood. But there was no one in place to raise the bridge because the city thought that it would be too expensive to employ someone to prevent such disasters from occurring. We are here today to ask for compensation and justice for the City's failure to spend a little extra on the precaution which would have prevented this disaster.

Today we will hear testimony from a City disaster planner which shows that the City should have considered employing a bridge operator during the winter. We will hear testimony from a meteorological expert who will tell us the Miniwapa River runs high every spring. We will hear testimony that each winter the river is filled with large, fast-moving pieces of ice. And we will hear evidence that the City knew that the possibility existed for the bridge to act as a dam and cause a flood to occur. In short, the evidence will show that the accident was a foreseeable and probable event that the City should have taken precautions to avoid. Thank you.

JUDGE: Is the defense ready to proceed with your opening argument?

DEFENSE: Yes, your honor, thank you. Ladies and Gentleman, the plaintiff makes it sound as if the City did nothing to avoid this type of accident. This is not true. Today you will hear testimony from several experts, including some of the plaintiff's own witnesses, that the accident was a freak occurrence. The City planners in charge of the bridge will tell you that they considered the possibility of such an accident. You will hear why these conscientious people decided that this type of accident was a highly improbable event. After you hear how the accident occurred and the unlikely events that had to take place for it to occur, you will agree that the City planners made the correct decision. The accident was so unlikely that it could not justify the expense of employing a bridge operator throughout the winter.

JUDGE: Thank you. Is the plaintiff ready to call your first witness?

PLAINTIFF: Yes, Your honor. We call Dr. Richard Harris.

BAILIFF: State your name for the Court please.

HARRIS: Richard Harris.

BAILIFF: Do you swear to tell the truth, so help you God?

HARRIS: I do.

PLAINTIFF: Dr. Harris, what is your occupation?

HARRIS: I am a meteorologist. I work for the National Weather Service.

PLAINTIFF: What are your qualifications and education?

HARRIS: I have a Ph.d in meteorology from the University of Minnesota. And I have been working for the weather service for twelve years as an analyst.

PLAINTIFF: What, specifically, do you do for the Weather Service?

HARRIS: I analyze data on rainfall in the Greater Duluth Area.

PLAINTIFF: Could you elaborate please?

HARRIS: Yes. I look for patterns of rainfall during the year throughout the area. We use this data to predict rainfall during each season of each year. We give this information to area farmers and construction planners. The farmers use the data to determine which crops to plant at which times. The planners use it to determine possible flood sites.

PLAINTIFF: What can you tell us about the Minniwapa River?

HARRIS: Each year, we analyze rainfall in that area, and predict flooding levels of the River. The river rises dramatically each spring.

PLAINTIFF: Could you be more specific about how much the river rises?

HARRIS: Yes. We have been monitoring flood levels during the spring for each of the past sixty years. During the summer, the river runs at about eight to ten feet deep near the mouth, and rises to between ten and twelve feet during the fall. It varies greatly in the spring.

PLAINTIFF: Tell us more about the spring floods?

HARRIS: Well, in the past sixty years, the river has risen as high as 21 feet, and it reaches at least 15 feet at least once each year.

PLAINTIFF: What do you mean by at least once?

HARRIS: Well, the river can flood multiple times in a single year. Sometimes we get an early thaw, and the river will flood and then freeze again when the temperature drops. Basically, it rises rapidly when the snow starts to melt.

PLAINTIFF: Can you predict how much the river rises?

HARRIS: Not very well, I'm afraid. How much it rises depends on how much snow there is and how rapidly the temperature rises. Lots of snow and a rapid increase in temperature can generate a lot of water. But if we have a mild winter that warms up gradually, it won't rise very much.

PLAINTIFF: Dr. Harris, you said the river has reached as high as 21 feet, how often has that happened in the past sixty years.

HARRIS: Well, it only got that high twice, and that was only near the mouth, where the bridge is. That was in 1956 and in 1965.

PLAINTIFF: How many times has the river crested above 20 feet?

HARRIS: May I consult my notes?

JUDGE: If there is no objection.

DEFENSE: Yes, I do object your honor. If he is going to simply read us his notes, may we put them into evidence for all of us to see?

JUDGE: That sounds reasonable, plaintiff, put the notes into evidence.

PLAINTIFF: Very well. Your honor, I offer the notes of Dr. Richard Harris regarding flooding in the Miniwapa River into evidence as plaintiff's Exhibit A.

JUDGE: So entered. Bailiff, please prepare copies for the jury.

Please Read Exhibit A Now Before Proceeding

Exhibit A

TO: Joseph Bosniak, Director, Northern Minnesota Div., National Weather Service

FROM: Richard Harris

RE: Flood Level of Miniwapa River

DATE: August 15, 1987

As per your request, I have reviewed the data on high water levels of the Miniwapa River. Data was available from 1931. During that time, the water level has been stable at between 10 and 12 feet during every season except spring, when it generally rises to between 12 and 15 feet. It has crested higher than 18 feet on 14 occasions since 1931.

These are listed below:

03/14/35- 18 feet

03/17/35- 18 feet

02/28/43- 19 feet

03/16/43- 19 feet

01/31/56- 21 feet

02/27/56- 18 feet

03/14/56- 19 feet

03/15/56- 20 feet

02/25/65- 19 feet

03/03/65- 18 feet

03/15/65- 18 feet

03/27/65- 18 feet

04/02/65- 21 feet

03/21/77- 20 feet

Richard Harris

PLAINTIFF: Regarding these notes, Dr. Harris, can you tell us what they are?

HARRIS: This is a memorandum describing how frequently the Miniwapa River has risen above 18 feet in the past 60 years.

PLAINTIFF: When did you write this?

HARRIS: In 1987 - it was a routine memo. I wrote them on many of the area's streams and rivers.

PLAINTIFF: According to your memo, in the last 60 years how many times has the river crested above 18 feet as it did during the disaster in question?

HARRIS: 14 times.

PLAINTIFF: Thank you, Dr. Harris. I have no further questions.

JUDGE: Defense, you may question the witness.

DEFENSE: Dr. Harris, according to this memo, how often has the river crested above 20 feet.

HARRIS: Four times, twice in 1956, as I mentioned, once in 1965, and once in 1977.

DEFENSE: What stage is considered flood level for this river?

HARRIS: Well, right now the river is flooded if it crests over 22 feet.

DEFENSE: So the river had never flooded until the bridge was built, is that correct?

HARRIS: Yes. Well, actually in 1956 and 1965, when it crested at 21 feet, it flooded.

DEFENSE: Excuse me, but how is it that flood stage is 22 feet and it flooded at 21?

HARRIS: Until 1965, the flood stage was 20 feet. Since then, the City and the property owners have built higher embankments to contain the river.

DEFENSE: Getting back to the memo, not including the current case, in how many years has the river crested at least one time above 18 feet?

HARRIS: In 5 years. Twice in 1935, twice in 1943, four times in 1956, five times in 1965, and once in 1977.

DEFENSE: You stated that the river is somewhat unpredictable, but can you use these figures to estimate the odds that in a given year the river crests at over 18 feet?

HARRIS: Well, probably less than one in ten.

DEFENSE: Over twenty feet?

HARRIS: Maybe one in twenty.

DEFENSE: No further questions, Dr. Harris, thank you.

JUDGE: Dr. Harris, you may step down. Next witness please.

PLAINTIFF: The Plaintiff calls Mr. Dave Thomas.

BAILIFF: State your name for the Court please.

THOMAS: My name is Dave Thomas.

BAILIFF: Do you swear to tell the truth, so help you God?

THOMAS: I do.

PLAINTIFF: Mr. Thomas, what is your occupation?

THOMAS: I am a civil engineer employed by the City Disaster Preparedness Committee. My job is to review each new construction by the City. I look for potential hazards and dangers involved in the new construction. My job is basically to figure out possible disasters that others may miss. According to the laws of the City of Duluth, we are to prepare a report, in the form of a memorandum, on each and every new construction undertaken by the City.

PLAINTIFF: Did you prepare such a memorandum in connection with the Miniwapa Bridge?

THOMAS: Yes.

PLAINTIFF: Is this a copy of that memo?

THOMAS: Yes it is.

PLAINTIFF: Your honor, I would like to submit into evidence as Exhibit B the memo in question.

JUDGE: Objections?

DEFENDANT: No, your honor.

JUDGE: The memo is admitted. Bailiff please prepare copies for the jury.

Please Read Exhibit B Now Before Proceeding

Exhibit B

TO: City of Duluth Urban Planning Commission

FROM: City of Duluth Disaster Preparedness Commission

RE: Drawbridge Over Miniwapa River

DATE: May 27, 1988

In accordance with our task of assessing possible hazards resulting from new City sponsored construction, this Commission has analyzed the new bridge, recently completed over the Miniwapa River. This bridge is a drawbridge which can be raised and lowered to permit river traffic to pass underneath, when necessary. In analyzing possible disasters resulting from this bridge we have assessed disasters of three possible sources: automobile accidents, barge traffic accidents and flooding. With regards to automobile hazards, this Commission finds that the traffic signals placed on either side of the structure are adequate to prevent serious risk of vehicular accidents. Before the bridge can be raised, the bridge operator must activate red lights on either side of the bridge, and lower two gates on either side. Drivers have the benefit of seeing a red light and a lowered gate to prevent them from attempting to drive on the bridge while it is raised. Furthermore, the bridge is designed so that it cannot be raised while a vehicle of significant weight (any sized car or more) is on the bridge. This bridge conforms to acceptable traffic safety standards and city construction codes #4-4172 and #5-4086. We recommend that a regular inspection routine be set up to ensure that the traffic lights and gate are in proper working order. With regards to hazards from river traffic, this Commission considered the possibility of boats or barges colliding with the bridge. This type of accident should not occur as long as a bridge operator is in place. A collision between boats and the bridge can easily be prevented by instructing bridge operators to raise the bridge whenever river traffic is approaching. To ensure that no accidents occur, the Commission recommends that the City give careful

training to its bridge operators. Finally, the Commission has considered the possibility of flooding from the Miniwapa River. In the winter months, the river freezes and sometimes thaws. During such thaws, the river has been know to crest at 17 or 18 feet. The river is not used for traffic during the winter months, since it is either frozen or flooded in the months of December through April. During the thaws, the river is filled with large, fast-moving pieces of ice. The Commission is concerned that at extremely high levels of flooding, ice on the river could collide with the bridge, causing damage to it. Also, if enough ice should be dammed up by the bridge, it could create a backlog and force the river above its flood level. Such a flood would overspill onto the flood plain of the river, which is occupied by a commercial bakery and a city park. While damage to the park could be minor, the bakery could sustain severe damage. The Commission is unaware of the likelihood that such a problem could occur. The river itself would have to crest at 21 feet to come up to the bottom of the bridge. Ice in the river could hit the bridge if the river were two or three feet lower than this. Although the Commission is aware that the river has reached 18 feet in the past, it is unaware of how likely a crest of 18 or 19 feet might be. The Commission recommends that the Urban Planning Commission investigate this possibility and consider employing a bridge operator full time in the winter.

Steve O'Neill
Chair

Dave Thomas
Assistant

Irene Labenski
Assistant

PLAINTIFF: Mr. Thomas, was your committee concerned about any possible flooding which could result from the construction of the bridge?

THOMAS: Yes. As it says in the last paragraph, we were aware that the river had crested very close to the height of the bridge.

PLAINTIFF: How high is the bridge?

THOMAS: The bottom of it is about twenty-one feet above the riverbed.

PLAINTIFF: Should we be concerned about flooding?

THOMAS: When the river thaws, it runs deep and fast. It also fills with ice and debris. We ought to consider the possibility that some of this could get lodged under the bridge and cause a backlog and a flood. In this way, the bridge itself might add to the likelihood of a flood since things can get caught under it and essentially create a dam.

PLAINTIFF: Exactly what occurred on March 17, 2006?

THOMAS: Yes.

PLAINTIFF: So, this memo expresses the concern that ice and debris will lodge under the bridge, correct?

THOMAS: Yes.

PLAINTIFF: What about other things. Do boats often break loose on the river?

THOMAS: It happens. That is why we mentioned it in the memo.

PLAINTIFF: No further questions.

JUDGE: Defense, you may question the witness.

DEFENSE: You testified that your committee was concerned about a boat lodging under the bridge, correct?

THOMAS: Yes.

DEFENSE: But it happens in the summer, not the winter, right?

THOMAS: I am only aware of boats breaking loose in the summer.

DEFENSE: Mr. Thomas, to your knowledge, has there ever been a report of a boat breaking loose in the winter?

THOMAS: No.

DEFENSE: No further questions.

JUDGE: Mr. Thomas you may step down. Next witness.

PLAINTIFF: We would like to call Ms. Ann Jones.

BAILIFF: State your name for the Court please.

JONES: Ann Jones.

BAILIFF: Do you swear to tell the truth, so help you God?

JONES: I do.

PLAINTIFF: Ms. Jones, what is your occupation?

JONES: I am an employee of the Duluth Urban Planning Commission.

PLAINTIFF: What is your job, specifically?

JONES: Accounting officer. I make property value assessments for the commission.

PLAINTIFF: Were you involved in the review process regarding the Miniwapa River?

JONES: Yes I was.

PLAINTIFF: Did your committee review the memo marked Exhibit B during May or June of 1988?

JONES: Yes, we reviewed it at the beginning of June.

PLAINTIFF: Can you tell me about that meeting?

JONES: Well, the Disaster Committee sent us this memo. They are required by law to write such a memo, and we are required to review it.

PLAINTIFF: What did your committee do about the recommendation that the City should employ a bridge operator during the winter?

JONES: We reviewed it. We reviewed evidence from the meteorological people, we reviewed evidence from the design engineers, and we decided that the risk which the report spoke of was not worth the cost of employing a full time operator.

PLAINTIFF: Your committee made the wrong decision didn't it?

JONES: No, I believe we did the right thing. I regret the flood, but, given what we knew at the time, we made the right choice.

PLAINTIFF: Does the City now employ a bridge operator all winter?

DEFENSE: Objection your honor, what is the relevance of that.

JUDGE: Sustained, plaintiff, you know better than that. Ladies and gentlemen of the jury, you will ignore that last question. The issue at this trial is whether the decisions made in June 1988 were reasonable and sufficient. Precautions taken since then are not relevant to your decision. Plaintiff, continue please.

PLAINTIFF: Did the Committee generate an estimate as to the amount of damage that a flood would cause?

JONES: Yes, approximately one million dollars damage to a local bakery, and a hundred thousand dollars in damages to the bridge itself.

PLAINTIFF: No further questions your honor.

JUDGE: Defense, your witness.

DEFENSE: Ms. Jones, why did your committee decide not to hire a bridge operator for the full year?

JONES: Because we didn't think it would be worth the cost. Hiring a bridge operator was certainly the least costly precaution. But it still didn't seem worth the cost.

DEFENSE: Did you make an estimate as to how much a bridge operator would have cost the City?

JONES: We estimated that it would cost \$100,000 each year.

DEFENSE: But it would have prevented a \$1,000,000 accident, would it not?

JONES: Yes, but you have to remember that it was a \$1,000,000 accident which we believed was unlikely to have occurred. The flood was a freak event and we never expected it to happen. It seemed ridiculous to pay someone to sit by the bridge all winter and wait for an unlikely accident.

DEFENSE: No further questions, your honor.

JUDGE: Ms. Jones, you may step down. Call your next witness please.

PLAINTIFF: Your honor, the plaintiff rests.

JUDGE: Defense, are you ready to proceed?

DEFENSE: Yes, your honor.

JUDGE: Call your first witness, please.

DEFENSE: Defense calls Mr. Steve O'Neill.

BAILIFF: State your name for the Court please.

O'NEILL: Steve O'Neill.

BAILIFF: Do you swear to tell the truth, so help you God?

O'NEILL: I do.

DEFENSE: Mr. O'Neill, what is your occupation?

O'NEILL: I am the chairperson of the City's Disaster Preparedness Commission.

DEFENSE: What does your Commission do?

O'NEILL: We review all new constructions for possible hazards and unforeseen dangers.

DEFENSE: Is Mr. Dave Thomas on this committee also?

O'NEILL: Yes, he has been my colleague for several years.

DEFENSE: As you may know, Mr. O'Neill, Mr. Thomas has already spoken with us today. At that time he gave us this memo, labeled Exhibit B. Do you recognize this memo?

O'NEILL: Yes, it's the memo we did on the Miniwapa River drawbridge.

DEFENSE: Can you tell us a little about it?

O'NEILL: Well, it was just a routine memo. We can almost always find some potential disaster that nobody else has thought of.

DEFENSE: Are you saying then that you weren't really worried about some of the accidents listed in here actually happening?

O'NEILL: Well, that's not really our job. We are concerned with pointing out possible hazards, no matter how remote. It's up to the City to decide what to do about them.

DEFENSE: Do you recall how possible you believed a flood to be?

O'NEILL: Yes, it seemed very unlikely to me.

DEFENSE: Can you tell us a little bit about Mr. Thomas.

O'NEILL: Thomas is very good, but he takes his job to extremes sometimes.

DEFENSE: How so?

O'NEILL: Well, he is very good at dreaming up possible disasters. We sometimes wonder why he isn't afraid of getting out of bed in the morning.

DEFENSE: Thank you, I have no more questions.

JUDGE: Cross examination, plaintiff.

PLAINTIFF: Mr. O'Neill, when you described Mr. Thomas as too good at dreaming up disasters, I am a little surprised. Isn't it your job to dream up possible disasters?

O'NEILL: Well, as I said, Mr. Thomas is a good planner, and I respect the job he does. He's an asset to our committee. But he is often too zealous and can hold up projects.

PLAINTIFF: I see. Mr. O'Neill, when you said that you did not believe that an accident would occur, what did you base that on?

O'NEILL: Oh, mostly it's my opinion after reading through the meteorological data.

PLAINTIFF: It's not your job to assess the likelihood of a disaster is it?

O'NEILL: No, just to outline potential hazards.

PLAINTIFF: You don't list outlandish possibilities when writing such a memo do you?

O'NEILL: No, the hazards we list are all potentially very real ones.

PLAINTIFF: So is it safe to say that because you listed flooding in the memo on the Miniwapa bridge that such an occurrence was a potential hazard?

O'NEILL: Yes, it was.

PLAINTIFF: So a flood was not an outlandishly unimaginable freak accident?

O'NEILL: No, it was not.

PLAINTIFF: Just very unlikely.

O'NEILL: Yes.

PLAINTIFF: I have no further questions.

JUDGE: Mr. O'Neill, you may step down now.

DEFENSE: The defense calls Mr. George Mahoney.

BAILIFF: State your name for the Court please.

MAHONEY: George Mahoney.

BAILIFF: Do you swear to tell the truth, so help you God?

MAHONEY: I do.

DEFENSE: Mr. Mahoney, what is your occupation.

MAHONEY: I have been the city dock inspector for ten years.

DEFENSE: How many boats are usually moored on the river in the winter?

MAHONEY: Usually about 20 in the winter. Their owners keep them tied up starting in November. Nobody does any shipping on the river in the winter, because the river's frozen.

DEFENSE: How well are the boats tied?

MAHONEY: Very well. We have to worry about them getting loose when the spring thaw melts the river. It can get pretty rough. Every November, the owners tie up all of their boats securely for the winter. It's my job to double check the moorings.

DEFENSE: So could a boat break loose?

MAHONEY: It's hard to say. It can get pretty rough some winters and sometimes when it thaws quickly, the thaw can loosen the moorings and damage the ropes.

DEFENSE: Wouldn't you have noticed this?

MAHONEY: No. I check the moorings in the spring also, but you wouldn't be able to detect that sort of a problem.

DEFENSE: Why not?

MAHONEY: Well, any damage to the rope caused by the winter would be inside the rope. Also, by loose mooring, I don't mean that you can just move the boat around. These boats weigh several tons, and maybe you or I can't move them, but that doesn't mean that the river can't.

DEFENSE: How long have you worked at the Miniwapa River?

MAHONEY: Ten years, total.

DEFENSE: During that time, have you ever seen boats break loose?

MAHONEY: Sure, a few times.

DEFENSE: During the winter?

MAHONEY: No, I mean during the summer. Everybody ties up their boats tight in the winter. As I said, it can get pretty rough.

DEFENSE: So you have never seen or heard of a boat breaking loose during the winter?

MAHONEY: No, I have not.

DEFENSE: No further questions.

JUDGE: Plaintiff, any questions?

PLAINTIFF: You say that you have never heard of a boat breaking loose on the river during the winter?

MAHONEY: Yes.

PLAINTIFF: Isn't it possible that it has happened in the past and that you have not heard of it?

MAHONEY: It's possible, but if it happened in the last ten years, I would have heard of it.

PLAINTIFF: No further questions.

JUDGE: Mr. Mahoney, you may step down. Any more witnesses?

DEFENSE: No your honor, defense rests.

PLAINTIFF: Your honor, we would like to call a rebuttal witness.

JUDGE: Go ahead.

PLAINTIFF: Your honor, we call Mr. Martin Davis.

BAILIFF: State your name for the Court please.

DAVIS: Mr. Martin Davis.

BAILIFF: Do you swear to tell the truth, so help you God?

DAVIS: I do.

PLAINTIFF: Mr. Davis, what do you do?

DAVIS: I've been retired for ten years, but before that I worked as a dock inspector for the City of Duluth.

PLAINTIFF: How long did you do that?

DAVIS: Over forty years.

PLAINTIFF: Mr. Davis, in your experience as a dock inspector, have you ever seen or heard of a boat breaking loose during the winter or spring?

DAVIS: Sure, it happened several times. I remember because losing a boat downstream was a big deal. It would get out into Lake Superior, and then you had to get it back, somehow.

PLAINTIFF: No further questions.

DEFENSE: Mr. Davis, you said that boats broke loose several times, can you be more specific?

DAVIS: Let's see. Four, maybe even five times that I know of.

DEFENSE: Can you tell us in what years these boats broke loose.

DAVIS: Well, in '56 we lost one. And then again in '65. Uh, maybe in 1970 one broke loose from the smelter. I don't remember the rest exactly, but I'm sure it happened more than that.

DEFENSE: No further questions.

JUDGE: You may step down, Mr. Davis. Any more witnesses?

PLAINTIFF: No your honor.

JUDGE: Defense?

DEFENSE: No, your honor.

JUDGE: Let's proceed with closing arguments then. Plaintiff, go ahead.

PLAINTIFF: Thank you, your honor. Ladies and gentlemen, what you have seen here today is an example of a failure on the part of the City of Duluth. They were aware of the danger posed by a potential flood. All of the witness from the City's Disaster Committee and Planning Committee told you that. When the defendants decided not to maintain a bridge operator throughout the winter, they knew everything that you know today. They knew the river can rise well above 16 feet. They knew that it often fills with ice. They knew that boats or debris sometimes float down the river. They even knew that the possibility existed for something to lodge under the bridge and cause a flood. In fact, they even knew how much damage it would cause. Yet, they are here telling you that the flood was a freak event, that it could not be predicted, and that they thought it wouldn't happen. Ladies and gentlemen, that's nonsense. They were wrong, it did happen exactly the way they had considered. In fact, it happened during the first winter that the bridge was in operation. It didn't seem like a freak accident to Dave Thomas. He warned the City about the possibility. So why didn't they do something to prevent this accident? They tell us that it was too expensive. They tell us that the risk didn't justify the precautions. Tell them that they were wrong. Tell them that they should have to pay for their failure.

JUDGE: Defense.

DEFENSE: Thank you, your honor. Ladies and gentlemen, we certainly sympathize with the plaintiff's losses. The plaintiff's company is a valued member of the business community in this area who employs many people. The city of Duluth needs companies like the plaintiff and welcomes their presence in our community.

And that's why, ladies and gentlemen, the defendant went through careful preparations and considerations of the potential hazards posed by this new bridge. That's why the City employs people like Dave Thomas and Steve O'Neill, whose sole function is to dream up potential hazards, no matter how unlikely. And make no mistake about it, the accident was an unlikely event. Yes, the City did have all of the evidence which you have. The planning committee was well aware of the possible hazard. But it was also aware, as are you, of how much it would have cost to eliminate the risk: \$100,000 per year. Every year. If that seems wasteful to you, remember that it also seemed wasteful to the Planning Committee when it decided not to hire such an operator. The City tries hard to eliminate hazards and risks, but it cannot eliminate them all. The flood was an unlikely event, one that the City could not have planned for and cannot be responsible for. Thank you.

JUDGE: Ladies and gentlemen, you have heard the evidence and the arguments, and I would now like to give you instructions as to how to decide the case. As I told you in the beginning, there have been many pre-trial stipulations and you are to decide the case on very narrow grounds. You are to decide the facts of the matter, and I will decide the law. The law on accidents and responsibility is clear on this point. The City of Duluth, as the trustee of the public welfare of the citizens and residents of the City is bound by law to take all reasonable precautions to avoid hazards and accidents. If they fail to take all reasonable precautions, then they are responsible for any consequences of that failure. What that means for this case is that if it was reasonable for the City to have hired a bridge operator for the winter, then their failure to do so leaves them with full responsibility for the flood.

The law also gives you a clear definition as to which precautions are reasonable, and which are not. In deciding whether the employment of a bridge operator throughout the winter was a reasonable

precaution, you must consider the economics of the decision. If the precaution would have prevented more harm than its cost, then the City is responsible for not taking the precaution. If, however, the precaution cost more than the harm it would have prevented, then the City is not responsible. When making this determination, you must take into account the probability that the accident was going to occur. This evaluation must be one of the probability that the flood would have occurred given the information available at the time the decision was made, not as of now.

The law makes the task fairly simple here. Since the parties have stipulated to the amount of damages at one million dollars, and the defense stipulated that this is the amount of damage they predicted, then this is the extent of harm of the flood. Also, both parties have stipulated to the cost of the precautions; \$100,000. The only number missing is the probability that the flood would have occurred. It is your job to supply that number. Therefore, if you find that the probability of a preventable flood each year *exceeds ten percent*, then you must find for the plaintiff. If you find that the probability of a flood is *less than ten percent*, then the City is not responsible for the flood since the precaution was not reasonable under the circumstances. The Court has provided a special verdict form which includes these instructions. You are to fill out this form when deciding the case. Thank you for your attention.

Fill in the blank:

The flood described above could have been prevented if only:

[Click here to continue](#)

Appendix H

Please carefully and thoughtfully answer the following questions:

At the time that the City of Duluth decided not to hire a bridge operator during the winter, how foreseeable was a flood? How foreseeable is a flood?

Not at all				Somewhat		Very		
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is the probability that a flood will actually occur in any given year? Ignoring the fact that a flood did occur on March 17, 2006, what is the probability of a flood actually occurring in any given year?

 %

****Carefully READ THE FOLLOWING legal instructions before answering the question below:**

In a civil case such as this one, the burden of proof is on the plaintiff to establish its case by a preponderance of the evidence. When I say that the plaintiff has the burden of proof, I mean that the evidence must satisfy you that the proposition on which the plaintiff has the burden of proof has been established by evidence which outweighs the evidence against it. Proof by a preponderance of the evidence means proof that something is more likely than not. It means that certain evidence, when compared to the evidence opposed to it, has the more convincing force and makes you believe that something is more likely true than not. If the plaintiff fails to meet its burden of proof or if the evidence weighs so evenly that you are unable to say that there is a preponderance on either side, you must resolve the question against the party who has the burden of proof in favor of the opposing party.

The plaintiff, Continental Bakeries, Inc., claims that the defendant, the City of Duluth, was negligent. Negligence is the lack of ordinary care; that is, the failure to do an act which a reasonably careful and prudent person would do, or the doing of an act which a reasonably careful and prudent person would not do, under the same or similar circumstances to protect others from injury or harm. A defendant is negligent if it fails to use a reasonable amount of care, skill and diligence that a reasonably careful person would use in similar circumstances to avoid exposing others to a foreseeable risk of harm. In determining whether the defendant used reasonable care, you should balance what the defendant knew or should have known about the likelihood and severity of potential harm resulting from its actions against the burden of taking

other actions to reduce or avoid the harm. A defendant must reasonably anticipate the foreseeable risks of harm that may result from its actions.

To prove that the defendant, the City of Duluth, was negligent, the plaintiff, Continental Bakeries, Inc., must prove by a preponderance of the evidence that the defendant failed to use reasonable care, skill, and diligence in its actions and that this breach of duty was a legal cause of the plaintiff's harm or loss.

Do you find from a preponderance of the evidence that the City of Duluth was negligent when it decided not to employ a bridge operator during the winter? I find that the City of Duluth should:

(Please check "Yes""Employ" if your answer to the probability question was greater than 10%, and "No""Not Employ" if your answer to the probability question was less than 10%.)

- No, the City of Duluth was not negligent. Not employ the bridge operator during the winter.
- Yes, the City of Duluth was negligent. Employ the bridge operator during the winter.

If the City of Duluth decided not to employ a bridge operator during the winter, and a flood actually occurred, how much, on a scale from 0% - 100% [where 100% = completely causal], would you say that the City of Duluth's decision not to employ a bridge operator contributed to the flood and subsequent damage to Continental Bakeries, Inc.'s property? In other words, on a scale from 0% - 100% [where 100% = completely causal], how causal of the hypothetical flood would the City of Duluth's decision not to employ a bridge operator during the winter be? On a scale from 0% - 100% [where 100% = completely causal], how much would you say that the City of Duluth's decision not to employ a bridge operator during the winter contributed to the flood that occurred on March 17, 2006? In other words, on a scale from 0% - 100% [where 100% = completely causal], how causal of the flood and subsequent damage to Continental Bakeries, Inc.'s property was the City of Duluth's decision not to employ a bridge operator during the winter?

%

Please answer the following questions on a scale from 1 - "I strongly disagree with that statement," to 9 - "I strongly agree with that statement."

The situation in which the Chairperson of the City of Duluth's Urban Planning Commission found him/herself in the case summary I just read is relevant to a situation I have found myself in the past or may find myself in the future.

Strongly Disagree					Strongly Agree			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I can easily explain how the flood on the Miniwapa River occurred a flood on the Miniwapa River could occur.

Strongly Disagree					Strongly Agree			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Broken ice on the Miniwapa River caused could cause a lot of damage to boats and barges tied up at docks on the shore.

Strongly Disagree					Strongly Agree			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The chain of events that caused the flood on the Miniwapa River was could cause a flood on the Miniwapa River would be long and complicated.

Strongly Disagree					Strongly Agree			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If I were the Chairperson of the City of Duluth's Urban Planning Commission, I would have hired hire a bridge operator for the winter.

Strongly Disagree					Strongly Agree			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How much did you think about the following while reading and making judgments about the case summary?

What I would have thought if I were in the position of the Chairperson of the City of Duluth's Urban Planning Commission.

Not at all				Somewhat	A lot			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How I would have felt if I were in the position of the Chairperson of the City of Duluth's Urban Planning Commission.

Not at all				Somewhat	A lot			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What I would have done if I were in the position of the Chairperson of the City of Duluth's Urban Planning Commission.

Not at all				Somewhat	A lot			
1	2	3	4	5	6	7	8	9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Submit

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