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Trust Judgments and the Hindsight Bias Effect

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TRUST JUDGMENTS AND THE HINDSIGHT BIAS EFFECT

by

Martin Daniel Smith-Rodden
B.A. Virginia Wesleyan College, June 2003

A Thesis Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
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May 2010

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ABSTRACT

TRUST JUDGMENTS AND THE HINDSIGHT BIAS EFFECT

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A decision to trust or not to trust can be examined within a broader category of cognition research concerning decisions under uncertainty. The purpose of this research was to investigate trust decisions through the lens of the hindsight bias effect. The hindsight bias effect (sometimes known as the “I knew it all along” effect) is a consequence that often follows judgments under uncertainty. Two experiments examined participants’ evaluations of trust outcomes to determine if and how judgments of trust might be susceptible to hindsight biases. Experiment 1 exposed participants to vignettes depicting a third-party trust transaction between friends, with outcomes of varying degrees of surprise. Experiment 2 replicated this with a different vignette and improved balance in the experimental manipulation. Hindsight bias effects for judgments of trust and corresponding patterns in memory distortions were observed, as predicted under the sense-making models of hindsight bias.

For Pam, Wilson and Kate –
...With love to my amazing family – a dedication such as this is not nearly enough to
celebrate what a blessing you are and how much you have supported me.

And to the memory of my parents, Bernie and Katherine Rodden,
who taught that accomplishment is always in my reach –
and who travel every moment with me, in my heart.

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INTRODUCTION

In an uncertain world and a highly interdependent society, trust is one of the most prized qualities in many interpersonal relationships (Barber, 1983; Rempel, Holmes, & Zanna, 1985). Trust is said to be “a psychological state composing the intention to accept vulnerability based on positive expectations of the intentions or behavior of another” (Rousseau, Sitkin, Burt, & Camerer, 1998, p. 395). It has been the subject of scholarly examination and research across many disciplines in the behavioral sciences including sociology, business studies, economics and a number of branches within psychology that include motivational, developmental, personality, cognitive and organizational psychology (Dunn & Schweitzer, 2005; Lewicki, Bunker, & Rubin, 1995; Rousseau, et al., 1998). What social scientists learn from people’s views toward trust, as well as any trust-related decisions and outcomes, can be of great benefit to society in general (Rotter, 1967; Rousseau, et al., 1998).

The current body of literature has shown us that trust is a multi-dimensional concept and research has developed into three distinct directions of examination (Lewicki, et al., 1995; Worchel, 1979). The first branch of research belongs to the personality theorists. This research tradition concentrates on an individual’s generalized disposition or set of expectancies toward trust behaviors, amounting to a trait condition that may be learned through experiences (Rotter, 1967, 1971, 1980) or resulting from events during previous developmental stages (Bowlby, 1969). A second research tradition is driven by sociologists and economists, where trust is examined as an institutional phenomenon, conceptualizing trust or distrust between and within institutions and groups

(see Farrell & Hardin, 2004, for an excellent examination of this view). A third perspective is social psychological, which focuses on transactional trust models. From this view, trust is believed to evolve from an individual's or a group's set of situational expectations or judgments about the behavior of another, often within the context of a specific relationship (Barber, 1983; Boon & Holmes, 1991; Good, 1991; Hardin, 2002; Lewicki, et al., 1995).

Theorists who examine the transactional model of trust seek to examine the fundamentals regarding the intricate conditions, contexts and cognitions which in turn drive people's trust judgments, behaviors and relationships (Hardin, 2002). One of the most frequently discussed fundamentals of trust is the element of *risk*. The inclusion of a word such as "vulnerability" in the definition of trust implies that elements of risk, consequence and uncertainty are inherent in trust judgments and transactions (Boon & Holmes, 1991; Hwang & Burgers, 1997; Lewicki, et al., 1995; Rempel, et al., 1985; Rotter, 1967, 1980; Rousseau, et al., 1998). In this light, decisions to trust or not to trust can be examined as *judgments under uncertainty*, in which people, through use of problem-solving predictive cognitions, try to make determinations about the probability of an outcome for a future event (Boon & Holmes, 1991; Kahneman, Slovic, & Tversky, 1982). This can be easily applied to trust. If a trustor's predictive judgment deems a target to be considered trustworthy, then they will be extended trust, which always means a certain assumption of vulnerability on the part of the trustor. People who make such risk-laden decisions under uncertain conditions may be prone to systematic and sometimes predictable errors, both before the judgment (Tversky & Kahneman, 1992) and after, as they reflect on the consequences of their judgments (Fischhoff, 1992). It is

the latter that is of particular interest in the context of this research. It is the latter, the examination of how trust judgments are processed under conditions of uncertainty, that is the focus of the present research.

Judgments of Trust

During a decision under uncertain conditions, such as a judgment of trust, a person may make a *predictive judgment* as to whether a person is trustworthy or not, based on a variety of reasons and information. During this task, they can engage in such problem solving through use of *heuristic* mechanisms (i.e., a person's habitual, cognitive rules) which are often driven by biases in perception and judgment (Tversky & Kahneman, 1992). When judging under uncertain circumstances, mental shortcuts result in quick, reasonable and sound judgments. However, because heuristic thinking is bias-laden and operates independently of data-driven, objective or reliable decision criteria and cognitions, it is not uncommon for an individual to make an error in judgment (Kruglanski, 1983).

Because trust decisions, as judgments under uncertainty, are susceptible to biasing and errors, such judgments may occasionally lead to unanticipated, surprising, disappointing or even grievous outcomes (Dunn & Schweitzer, 2005; Koehler & Gershoff, 2003; Rotter, 1980; Tomlinson, Dineen, & Lewicki, 2004). When viewed in reflection or hindsight, individuals have powerful opportunities to learn from these trust experiences and what is learned may shape future decisions (Olekalns & Smith, 2005).

As an example, consider the first vignette presented in Appendix A. Mark (a *trustor*), may evaluate the trustworthiness of Jim (a *target*) for repayment of a small monetary loan. The decision as to whether to not to extend trust toward Jim in making a

loan may be influenced by a number of elements. Mark may weigh factors of Jim's dependability and predictability, as well as the level of faith he has in Jim's willingness to uphold his end of the trust transaction (Rempel, et al., 1985). Also, likability has been implicated in theories of both social persuasion (Cialdini, 1993) as well as trust (Levine, 2003) as a factor that may moderate or influence decisions to trust.

Furthermore, as Mark deliberates the decision to trust Jim, he may do so through use of the availability heuristic, where information readily accessible and easily brought to mind is used to make a predictive determination regarding the target's likelihood of upholding a trust obligation (i.e. repayment of the debt). Because the availability heuristic operates only on information that can be quickly and easily assessed or recalled, the judgment of trust may fail to take into account other decision criteria, such as factors of probability and frequency (Tversky & Kahneman, 1992). For instance, Mark believes that he can probably trust his friend Jim for any number of reasons. So then, Mark may loan Jim money, based on recent personal history, friendship or kindred spirits – forgetting or discounting that Jim has had lapses in integrity in his dealings with others, struggles with finances and bill paying, can be moody, unpredictable and otherwise unreliable at times. It is possible a full examination of all the evidence, when considered empirically or objectively, might put into question the target's history, ability or inclinations toward repaying debts. When viewed through a less bias-laden lens, it might not be surprising if Jim ultimately fails to repay the debt to Mark.

Once a person has made a judgmental error following a failed heuristic, feelings of surprise or disappointment may invite reflective thought or a metacognitive monitoring of one's own memory of the initial judgment, in hope of learning or adapting (Flavell,

1992; Nelson, 1992). In such a *retrospective judgment*, one might hope to recall the original conditions, criteria and cognitions that formed the decision. One might then objectively reevaluate and adapt to make better future decisions. Considering the personal investment made in the decision to trust (in addition to other costs), a negative outcome would yield significant negative affect (Koehler & Gershoff, 2003). Therefore one would expect such an after-the-fact evaluation to receive hardy cognitive effort (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001).

Based on the accuracy and soundness of a person's memory, one might hope that the predictive and retrospective judgments are in accord; that the *retrospection* in hindsight is a veridical recollection or representation of the original *prediction* made in foresight, so that one might analyze and learn from the misadventure. Regrettably, we know that this may not always be the case.

The Hindsight Bias Effect

Many researchers have examined the effects that occur to our recollections of past judgments after receiving outcome information about a decision made under uncertain conditions (Fischhoff, 2007). People often claim to have known all along that an outcome was predictable after the fact, regardless of whether they could have or in fact did predict it beforehand. Early on, some psychologists questioned this seemingly self-flattering bias on the part of people's recollections regarding their own predictive abilities: "If we're so prescient, why aren't we running the world?" (Fischhoff, 2007, p. 10).

The hindsight bias effect, sometimes referred to as the "I knew it all along"

effect,¹ is “the tendency for individuals with outcome knowledge (hindsight) to claim that they would have estimated a probability of occurrence for the reported outcome that is higher than they would have estimated in foresight (without the outcome information)” (Hawkins & Hastie, 1990, p. 311).

In his seminal article on hindsight bias, Fischhoff (1975) coined the phrase “creeping determinism” to describe a non-deliberate tendency for people to believe or proclaim a reported outcome to have been inevitable. In his series of experiments that measured reactions toward unfamiliar historic, news or case-history vignettes, Fischhoff (1975) found a consistent and largely unconscious propensity for people to overestimate the predictability of outcomes when compared to their own original predictions.

Hindsight bias is a ubiquitous effect influencing decisions made under uncertainty (Fischhoff, 1975) that has been found across a variety of situations, domains (Guilbault, Bryant, Brockway, & Posavac, 2004) and even cultures (Pohl, Bender, & Lachmann, 2002). Scholars have studied hindsight bias in a multitude of situations and conditions, focusing on types of outcomes, expertise, types of events or tasks, personal relevance or importance, positive or negative outcomes and experimental manipulations to increase or decrease hindsight bias (Guilbault, et al., 2004). Applied research has highlighted its manifestations in numerous types of consequential decisions, such as stock trading (Mark, Boburka, Eyssell, Cohen, & Mellor, 2003), political elections (Blank, Fischer, & Erdfelder, 2003), victim blaming (Janoff-Bulman, Timko, & Carli, 1985; Maurer & Robinson, 2008), legal outcomes (Harley, 2007; Wasieleski, Whatley, & Murphy, 2009),

¹ While the terms are used interchangeably in most literature, some research and theoretical explorations have operationally differentiated a Hindsight Bias Effect from an “I knew it all along effect.” See Pezzo (2003) for a thoughtful elaboration on this.

medical diagnoses (Arkes, Wortmann, Saville, & Harkness, 1981; Chapman, Elstein, & Sonnenberg, 2000; Dawson, et al., 1988), malpractice judgments (Dawson, et al., 1988) and decisions in forensic psychiatry (LeBourgeois, Pinals, Williams, & Appelbaum, 2007). While some theorists explore this bias through a self-affirming or motivational framework (Hawkins & Hastie, 1990) many researchers dating back to Fischhoff (1975) view this effect as operating outside of people's awareness or perception, which lends support to theories that focus on hindsight bias as an "automatic" cognitive effect. Furthermore, researchers posit that the hindsight bias is a potentially harmful effect due to the apparent memory failure regarding one's own prediction decisions, as well as a sense of mistaken determinism. It follows, logically, that one is unlikely to learn from decisions if they are unable to recall them accurately (Fischhoff, 1992), or if one deludes oneself that unanticipated outcomes are clearly inevitable and were more predictable than they in fact were (Blank, Musch, & Pohl, 2007; Dawson, et al., 1988; Fischhoff, 2007; Hoch & Loewenstein, 1992).

Applying Hindsight bias to trust

Considering the money loan scenario discussed in the earlier section, an example of a retrospective judgment showing the hindsight bias effect in post-betrayal might be Mark claiming: "I knew I probably couldn't trust Jim to repay the money." In fact, according to the hindsight bias effect, Mark *may or may not* have foreseen Jim's loan default in his predictive judgment, or with such a degree of certainty as he stated after the fact.

There is much in the respective literature traditions of both trust and hindsight bias that suggests many points of intersection between the two theoretical frameworks,

not the least of which is the shared foundation regarding people's decisions under uncertainty. Yet, despite a recent line of largely theoretical literature examining themes of betrayal and trust evaluation (Tomlinson, et al., 2004) and despite the many and diverse examinations of hindsight bias, little if any scholarly examination has focused on both hindsight bias *and* trust. Given the lengthy background of research in these areas, a thorough examination of trust decisions from a social cognition perspective – through the lens of decision making under uncertainty and highlighting the hindsight bias effect – could serve to fill this interesting and surprising gap in the literature.

As with any judgment under uncertainty, the available information with which to make a predictive judgment may vary in quality and quantity. Information can vary in the degrees to whether it supports a specific outcome (a *congruent* condition), or fails to support an outcome (an *incongruent* condition). Also, the pre-outcome information may neither support nor refute a specific prediction as to whether an outcome will happen (an *ambivalent* condition). These conditions can lead to varying degrees of surprise at an outcome. In a series of studies, Ash (2009) developed a repeated-measures design following such a model, where the pre-outcome information available to participants was controlled to manipulate the degree of surprise they felt after learning an outcome. Participants' predictions of outcomes to sports vignettes were measured and experimenters found evidence of hindsight bias effects in the incongruent and ambivalent scenarios, but not for the congruent condition.

This lent support to certain *cognitive reconstructive* theories known as the *sense-making models for hindsight bias* (Ash, 2009; Nestler, Blank, & von Collani, 2008; Nestler & von Collani, 2008; Pezzo, 2003). Cognitive reconstruction theories are a family

of hindsight bias explanations that place emphasis on the formative or reconstructive nature of human memory. These theories posit that, when people are tasked to recall an event, they do not retrieve a memory in any literal sense. Instead, they reconstruct the memory from the sampling evidence, which is available in long term memory (Hawkins & Hastie, 1990). This is to say that the cognitions, opinions and imagery that constitute episodal memory are re-formed at that moment of retrospection (see Ash, 2009, for a review of these diverse theories). As explained in the sense-making theories of hindsight bias, a surprising outcome may result in activating sense-making cognitions on the part of the individual. Sense-making has been defined as a set of motivated, sustained, explanatory or problem-solving cognitions that occurs as an individual takes note of an event and then is moved to interpret, appraise and satisfactorily explain the event (Anderson, Krull, Weiner, Higgins, & Kruglanski, 1996; DiFonzo & Bordia, 2007). In an unanticipated outcome and especially if associated with a task failure, one may be cued into the engagement of a sense-making process if there are sufficient mental resources, motivation and time available (Anderson, et al., 1996).

As outcome-supporting information or knowledge structures become more accessible in a person's memory due to the influence of the outcome itself, such information influences the recollection of the predictive judgment as the memory is reconstructed and creates the (so-called) bias. Since an outcome that is incongruent with pre-outcome expectations results in motivated sense-making, the outcome-supporting information receives additional processing. As such, it may become a more salient set of sampling information and therefore more easily recalled during retrospection. Therefore, research has shown more of a hindsight bias effect following incongruent outcomes

rather than after more congruent outcomes (Ash, 2009; Nestler, et al., 2008; Nestler & von Collani, 2008; Pezzo, 2003; Pezzo & Beckstead, 2008; Pezzo & Pezzo, 2007).

Because hindsight bias is a ubiquitous effect found across a wide variety of research designs, one would expect trust decisions to yield measurable results when examined using established experimental methods. To begin a systematic line of research, a series of laboratory studies were conducted to test hindsight bias in a sequence of third-person trust scenarios. Additionally, the participants' generalized expectancies and "real world attitudes" regarding trust were examined to explore whether these traits influenced their judgments in the laboratory setting.

The hindsight bias, operationally defined, is comprised of a differential between predictive and retrospective judgments; therefore an observation of the effect seems to lend itself well to a repeated-measure experimental design (Ash, 2009). Pre-test and post-test experimental designs have shown measurable and significant hindsight bias effects, although not usually as large as the effect sizes from between-subject designs (Guilbault, et al., 2004).

To examine how the construct of trust might intersect with the hindsight bias effect, participants' responses to text-based scenarios, or vignettes, of a trust-based transaction between two unfamiliar people were examined to see if there was a resulting hindsight bias effect. In a previous study (Ash, 2009) effectively measured hindsight bias using vignette-based testing. In this research, it was found that the hindsight bias was observable when participants received incongruent or ambivalent pre-outcome information, but not when the information was congruent with the outcome. Participants were also able to recall significantly more outcome-supporting information when the pre-

outcome information was incongruent, relevant to the outcome (Ash, 2009). Some of those paradigms were partially replicated by measuring participants' prediction and retrospection responses to witnessing dyadic trust transactions between unknown third parties. Specifically, hindsight bias effects regarding perceptions of trustworthiness were measured under a variety of expectancy conditions, such as the incongruent, congruent and ambivalent scenarios, to examine differences in effects due to influence of post-outcome sense-making that were brought on by the metacognitive condition of surprise. Though a dominant topic of interest in most hindsight research concerns distortions of probability regarding various outcomes (Blank, et al., 2007; Fischhoff, 2007; Guilbault, et al., 2004), this study may be the first to focus on how hindsight effects might change perceptions of trustworthiness.

First, if trust decisions would fall under the category of judgments under uncertainty and because judgments under uncertainty often yield hindsight bias effects, then (H₁) significant hindsight bias effects would be observed during judgments of trust. Secondly (H₂), based on previous research involving hindsight bias, it was predicted that significant hindsight effects would be observed in both incongruent and ambivalent conditions, where a participant might engage in successful sense-making cognitions that have been linked to yielding hindsight bias effects. It was anticipated that no hindsight bias effects would be detected among participants exposed to "congruent" conditions, where participants did not attempt to make sense of an expected outcome, since the outcome fell within the person's set of prior-outcome expectancies (Ash, 2009; Nestler, et al., 2008; Nestler & von Collani, 2008; Pezzo, 2003; Pezzo & Pezzo, 2007)

A series of exploratory measures were employed in this study. A free recall memory task was administered to participants, as well as two inventories measuring generalized dispositions for interpersonal trust: the Interpersonal Trust Scale (ITS, Rotter, 1971, 1991) and the Revised Philosophies of Human Nature Scale (RPHN, Wrightsman, 1991, 1992). A free recall memory task, which was administered to all participants, was used to investigate effects in the accessibility of outcome-supporting information. Based on the previous research (Ash, 2009), it was predicted that (H₃) more recall of outcome-supporting information would be observed in the incongruent or ambivalent information than for the congruent conditions, in concurrence to observing hindsight bias.

To investigate how the effects of individual differences regarding trust might affect hindsight bias, the ITS and the RPHN were employed. These scales were used to determine the participants' generalized trust expectancies as a trait measure, to ascertain to what degree dispositions toward trust might influence a hindsight bias after witnessing a trust transaction. These measures were also compared against other measures in the design, in an exploration for trends and influences.

PILOT TESTING

Prior to beginning this series of experiments, it is necessary to have reliable materials with which to test participants' responses regarding their perceptions of trust in social transactions. To establish instrument reliability and validity on the untested depictions of interpersonal trust, a pilot study was conducted using an online survey to measure reactions to several scenarios.

Method

Participants

Forty-four participants were recruited from the pool of undergraduate students at Old Dominion University, using the form in Appendix B. The volunteers were a minimum of 18 years of age. Each participant received one research credit as compensation, disseminated through an online management tool known as the SONA University Student Research Participant System. The ethical guidelines of the American Psychological Association (A.P.A., 2002) were followed for these procedures. All studies in this research project were reviewed and deemed exempt by the College of Science Human Subjects Review Board (Appendix C). All participants received a notification document online regarding their rights as volunteers prior to the procedures (Appendix D).

Apparatus

A survey was constructed and administered on a university website using Inquisite™ survey software. Participants read four *pre-outcome scenarios* (Appendix A) that were “case history” narratives of a trust-based interaction between a pair of fictitious individuals. The scenarios consisted of a series of descriptive situational statements,

which were intended to manipulate expectations (i.e. perceptions of a target's trustworthiness), prior to an outcome, as determined by the content and combination of the sentences. These scenarios summarized the nature of the relationship and details of the situations: a small loan request between college roommates, a decision of a young professional about to confide to a colleague about a same-sex partner, the quandary of a small business owner in hiring a friend, or a decision of a college sophomore to tell her roommate a secret about an unplanned pregnancy. All of these scenarios were designed in an attempt to equate manipulation statements that both encouraged and discouraged perceptions of trustworthiness toward the target in the story. As such, the equated and balanced combination of trust statements in each scenario represented an ambivalent condition.

Design and Procedure

In a single-session online survey that was accessed through use of an online university research participation system known as SONA, the participants viewed an online page notifying them of details of their informed consent as a volunteer for the study and pending their acceptance of the document, went on to read the four pre-outcome scenarios. After reading each scenario, participants responded to a series of questions. The participants' responses were measured on a seven-point Likert scale inventory regarding their predictions of the scenario's outcome and target trustworthiness, as well as item-by-item evaluations of how they may influence reactions among participants. A score of four equated to perceptions of neutrality regarding target trustworthiness. First, participants were asked whether or not they thought the trustor in the story would ultimately trust the target. Secondly, participants were asked if they

thought the target was trustworthy (our variable of interest). Next, they were asked to evaluate each sentence in the scenario and would indicate as to whether they believed a statement supported trust or distrust toward the target. After reading and responding to all four vignettes, the participants were debriefed in a final webpage (Appendix E) and then were taken to a separate site where they left information to receive participation credit. These pilot tests were analyzed using one-sample *t*-tests to determine their distance from a midpoint rating and establish if these vignettes represented a balanced condition with regard to participants' perceptions of target trustworthiness.

Results

Of the four pre-outcome scenarios, two showed desirable central tendencies among participant responses in the ambivalent condition. The first was a story about a student who deliberated whether or not to grant a small loan to his roommate ($M=3.50$, $SD=1.69$). The second was a story of a small business owner who had to decide whether or not to hire a friend ($M=3.58$, $SD=1.62$). Responses indicated that statements that were designed to influence trust positively toward a target tended to be very effective in doing so. Participants reported that, in the money loan scenario, statements designed to support trust ($M=5.69$, $SD=.27$) significantly differed from a neutral response and did in fact foster trust toward the story's target, $t(43)=16.39$, $p<.001$. Also, responses for the money loaning scenario indicated that statements that were designed to support distrust ($M=2.91$, $SD=.53$), did act to inhibit feelings of trust toward the target, $t(43)=-7.20$, $p<.001$. For the small business hiring scenario, statements that were designed to encourage trust ($M=5.36$, $SD=.45$), similarly fostered trust in favor of the story's target, $t(43)=13.10$, $p<.001$. Manipulation statements that were designed to support distrust ($M=2.71$, $SD=.56$),

succeeded in doing so according to their reports, $t(43)=-15.18, p<.001$. Cronbach's alphas for the trust-focused statements for the first and second scenarios were .84 and .86 respectively. Alphas for the distrust-focused statements were .93 and .74 for the first and second scenarios. When viewed in the aggregate, these responses indicated a reasonable to high level of reliability regarding these scenarios. These two pre-outcome scenarios, demonstrating two different types of interpersonal trust situations (one an interpersonal money loan and another being a small business employment decision) were used in the following series of experiments.

EXPERIMENT 1

The goal of this experiment was to examine whether trust judgments may be susceptible to hindsight bias effects as are other judgments under uncertainty. Personality or dispositional traits regarding trust were also explored to investigate how they might moderate hindsight bias effects. Participants were exposed to vignettes consisting of story-based scenarios and outcomes depicting decisions of interpersonal trust. Patterns of hindsight bias were expected during conditions of surprise or ambivalence toward an outcome, but not for expected outcomes.

Method

Participants

One hundred and eighty participants were recruited from the volunteer participant pool of students at Old Dominion University in Norfolk, Virginia, through use of the SONA University Student Research Participant System. A copy of the recruitment flyer is found in Appendix F. They received two research credits, one for each appointment/hour, as compensation for their participation. The volunteers were mostly young adults in this convenience sample. Ninety-three percent were between the ages of 18 and 25 and seven percent were between 26 and 45. Most participants were female ($n=137$). Ninety-six percent reported that English was their primary language; two percent reported that English has been their primary language for more than a decade; one percent stated that English has been their primary language for less than five years and one percent said that English is not their primary language.

Apparatus

Programming system. The text-based vignettes, prediction/retrospection measures and the trust disposition inventories were created by using E-Prime experimental programming software and administered using personal computers.

Vignettes. The vignettes were constructed “case history” style narratives, which depicted a trust-based interaction between two fictitious individuals detailed in Appendix A: a story of a small loan between roommates. Each vignette consisted of two parts: *pre-outcome scenarios* and *outcome scenarios*.

Pre-outcome scenarios. The pre-outcome scenarios summarized the nature of the relationship and different aspects of the situation surrounding a small loan request (Appendix G). There were four initial sentences in the vignette that provided the setting for the story. Following that was a set of sentences that determined the pre-outcome scenario. This serves as the first between-subjects independent variable, with three levels: trust-supporting, ambivalent and distrust-supporting. In the interest of concise and non-cumbersome descriptions regarding the conditions, the pre-outcome levels will be referred to as *trust/ambivalent/distrust* throughout the remainder of this paper.

The ambivalent condition was designed to have an equal number of sentences to support both perceptions of trust and distrust toward the target in the story. These pairs of pro and con reasons, or manipulation statements, addressed situational aspects and social-psychological factors that are theorized to influence perceptions of predictability, dependability, or degree of faith in the target during trust decisions. Such factors include social influences, relationship history with the target, perceptions of likeability, integrity, ability to uphold trust expectations and reputation regarding social transactions in the past (Barber, 1983; Levine, 2003; Rempel, et al., 1985).

For the trust-supporting condition, five sentences were omitted from the vignette that cast doubt on a target's willingness or ability to repay the loan and therefore would support expectations of his defection in the outcome. With fewer reasons to doubt a target's trustworthiness, the target would seem more trustworthy (i.e., it may seem apparent and expected for the target to repay the loan to the trustor). In the distrust-supporting condition, five statements were omitted that would *support* an outcome of the loan being repaid.

After removing five sentences from either selection, there remained 64.28% of information that supported either a trust or distrust-supporting outcome and 35.72% that discouraged it. The presentation sequence of trust-supporting and distrust-supporting information was counter balanced into eight orders to control for primacy and recency effects, while still maintaining story cohesion.

Outcome scenario. The outcome scenarios were a short series of sentences that constituted a conclusion to the vignette (Appendix H). In every outcome scenario, the trustor in the vignette found the target trustworthy and chose to make the loan. The outcome scenario then presented to participants one of two possible conclusions: either the target paid back the loan and therefore was trustworthy, or the target failed to repay the loan and therefore defected. This constituted the second of the between-subjects independent variables: the vignette's outcome scenario, with two levels: (target is) trustworthy/ defection. Again, for the sake of brevity in the descriptions, references that follow for those two outcome levels will be *trust/distrust* for the remainder of this paper. A full map of all the vignettes, with pre-outcome and outcome pairings is illustrated in the frames on Figure 1.

		PRE-OUTCOME SCENARIO		
		Pre-outcome supports <u>Trust</u> toward target	Pre-outcome is <u>Ambivalent</u> i.e. neither supports trust nor distrust	Pre-outcome supports <u>Distrust</u> toward target
OUTCOME SCENARIO	"Trust" Target acts trustworthy (i.e. Loan is repaid)	<u>Trust / Trust</u> <i>(congruent)</i>	<u>Ambivalent / Trust</u> <i>(ambivalent)</i>	<u>Distrust / Trust</u> <i>(incongruent)</i>
	"Distrust" Target defects (i.e. Does not repay the loan)	<u>Trust / Distrust</u> <i>(incongruent)</i>	<u>Ambivalent / Distrust</u> <i>(ambivalent)</i>	<u>Distrust / Distrust</u> <i>(congruent)</i>

Figure 1: Experiment 1: Experimental manipulations, showing vignettes consisting of pre-outcome and outcome scenarios.

The *congruence* or *incongruence* of the vignettes was manipulated by the pairing of the pre-outcome scenarios with these outcome scenarios. For instance, if a pre-outcome scenario of trust were paired against a distrust outcome scenario, the resulting contrast between the antecedents and the outcome would constitute incongruence in the vignette. This was anticipated to lead to a heightened level of surprise on the part of the participant and therefore may prompt sense-making cognitions. On the other hand, if a trust pre-outcome were paired with a trust outcome, the perception of "fit," would constitute congruence in the vignette. For such a congruent vignette, very little surprise was anticipated, given the pre-outcome that supported trust toward a target that ultimately repaid the loan.

Free recall test. To capture participants' recalled information about the vignettes, participants received a single sheet, pencil-and-paper format, open-ended

questionnaire with the following instructions: “Write down all the information from last week’s story that you can remember. Try to remember as much specific information about the people, situation and setting as you can. Please write as neatly as possible.”

Trust disposition inventories. The two measurements of traits regarding interpersonal trust were administered to the participants by computer program. The Interpersonal Trust Scale (ITS, Rotter, 1967) is a 40-item questionnaire, with 25-measurement items and 15-distracter questions in a five-point Likert-scale format. The ITS inventory asks for the participants’ responses regarding their agreement, to a variety of situational statements regarding interpersonal trust (e.g. “Most people can be counted on to do what they say they will do.”). The ITS gives an index score ranging from 25 (lowest trust) to 125 (highest), with a midpoint or neutral position of 75 (Rotter, 1991). The ITS has had robust use since its inception four decades ago. This questionnaire shows strong evidence of construct validity, which includes significant correlations to sociometric trust scales, $r=.37$ (Rotter, 1967). The ITS shows test-retest reliability at three-month intervals of .68 (Robinson, Shaver, Wrightsman, & Andrews, 1991).

The Revised Philosophy of Human Nature Scale (RPHN, Wrightsman, 1991; Wrightsman, 1992) is a 20-question Likert scale (six-point) inventory that calculates an index using two subscale measurements: ten items measuring participants’ agreement responses to statements that favor interpersonal trust (e.g. “People usually tell the truth, even when they know they would be better off lying.”) and ten items measuring inclinations toward cynicism or non-trusting attitudes of others (e.g. “Most people would tell a lie if they could gain by it.”). In both the trust and cynicism subscales, the scales will range –30 to 30. The RPHN index scores cynicism negatively and combines both for a range of –60 (lowest trust in human nature) to 60, (highest trust), with neutral positions

of zero (Wrightsman, 1992). The RPHN also shows a strong history of use since 1974. There is evidence of convergent validity with comparable attitude measures such as Rosenberg's faith-in-people scale, $r=.77$, as well as Christie's Machiavellianism Scale, $r=-.68$, with a test-retest reliability of .90 (Robinson, et al., 1991).

Design and Procedure

The design is a 2 (predictive/retrospective judgment) X 3 pre-outcome scenario (trust/ambivalent/distrust) X 2 outcome scenario (trust/distrust) split-plot design with judgment as a within-subjects variable. Results were measured using a number of statistical analyses, including frequencies, descriptive statistics and a split-plot analysis of variance (ANOVA), with post-hoc tests, contrasts, planned comparisons and non-parametric analysis (i.e., t -tests) performed as needed. The participants were randomly assigned to all conditions. The data from this study consisted of responses to the prediction and retrospection queries, which were continuous scales with scores ranging from 1 to 80, determined by the marker's position on the answer continuum. For hypothesis testing, a statistically significant shift of retrospective judgment responses toward the outcome, when compared to predictive judgments at an alpha level of $p < .05$, constituted statistical significance as a hindsight bias effect.

One hundred and eighty participants were measured in two sessions, exactly one week apart. Participants who volunteered for the pilot study were excluded, as well as those who had participated in similar experiments examining hindsight bias. Two hundred twenty-one participants originally signed up to participate in this research through SONA for participation credit. Over the course of three college semesters, 17 participants (8%) were dropped because they failed to show up for the second session,

data from 20 participants was lost due to data collection errors² (9%), data from 4 participants were lost due to a malfunctioning lab computer (2%) and one participant (<1%) was dropped as an unreliable respondent due to conflicting demographic information that was provided in Sessions 1 and 2.

LEFT ARROW KEY moves LEFT RIGHT ARROW KEY moves RIGHT

Mark had to decide whether or not to trust Jim to pay him back...

Use the scale below to indicate your opinion of how trustworthy Jim is.

Definitely Not Trustworthy | Definitely Trustworthy

Press ENTER to record your response

Figure 2: Experiment 1: Example of screen for Session 1 measure of prediction judgment.

Session 1. Prior to the procedures in the first session, the participants received a notification of participants' rights (Appendix I), during an introductory briefing, which they signed to indicate their agreement to participate in the study. A brief series of introductory and instruction screens were first presented to the participants, as well as demographic questions to capture the participants' age, sex and experience with English.

² Data collection errors included: Eight participants (4%) who were assigned to wrong procedure on computer, eleven (5%) accidentally double-booked computer lab for the second session, and researcher accidentally gave one participant (<1%) a debriefing instead of the informed consent document.

They worked through a brief training session to familiarize themselves with the procedure. Following the instructions and practice session, the participants read the pre-outcome scenario in a vignette presented one line at a time on their monitors, as they advanced from screen to screen at their own pace.

Immediately after the pre-outcome scenario, the participants were queried for their predictive judgment. This prediction measure consisted of one question, presented to the participants on the screen (see Figure 2) to gauge their estimation of the target's trustworthiness: "Mark had to decide whether or not to trust Jim to pay him back... Use the scale below to indicate your opinion of how trustworthy Jim is." The question appeared next to a continuum marked "Definitely not trustworthy" on the left pole, with "Definitely trustworthy" on the right and the sliding bar appeared at a random point near the center of the band. The participants could move the sliding bar using the arrow keys on the computer keyboard to show their opinion of the target's trustworthiness.

LEFT ARROW KEY moves LEFT RIGHT ARROW KEY moves RIGHT

How important or relevant is the following sentence to the different possible outcomes (Trust or Distrust)?

On occasion, Mark has known Jim to have lapses in integrity, which include lying to girlfriends, and sometimes cheating on exams.

Supports
Distrust

Supports
Trust

Press ENTER to record your response

Figure 3: Experiment 1: Example of screen for one of the sentence ratings in Session 1.

Following the predictive measure, participants then responded to a series of inquiries (Figure 3) addressing each sentence of the pre-outcome scenario to determine how each sentence influenced perceptions of target trustworthiness for the recall memory task. Next, the outcome scenario was presented on the screen. Here the participants learned the outcome of the vignette: that, in fact, the target was trusted by his roommate and following that, whether or not the target ended up being trustworthy. All the outcome scenarios were randomly assigned. Following the outcome information, a final question was asked of the participants to measure their subjective feelings of surprise at the outcome: “How surprising was it that Jim paid back the loan?” or “How surprising was it that Jim didn’t pay back the loan?” Again the response was measured by moving a sliding bar across a continuum with “Not at all surprising” on the left pole, to “Very surprising” on the right, as shown in Figure 4.

LEFT ARROW KEY moves LEFT RIGHT ARROW KEY moves RIGHT

Please use the rating scale below to answer the following question...

How surprising was it that Jim paid back the loan?

Not at all
Surprising

Very
Surprising

Press ENTER to record your response

Figure 4: Experiment 1: Example of screen for Session 1 manipulation check for degree of surprise.

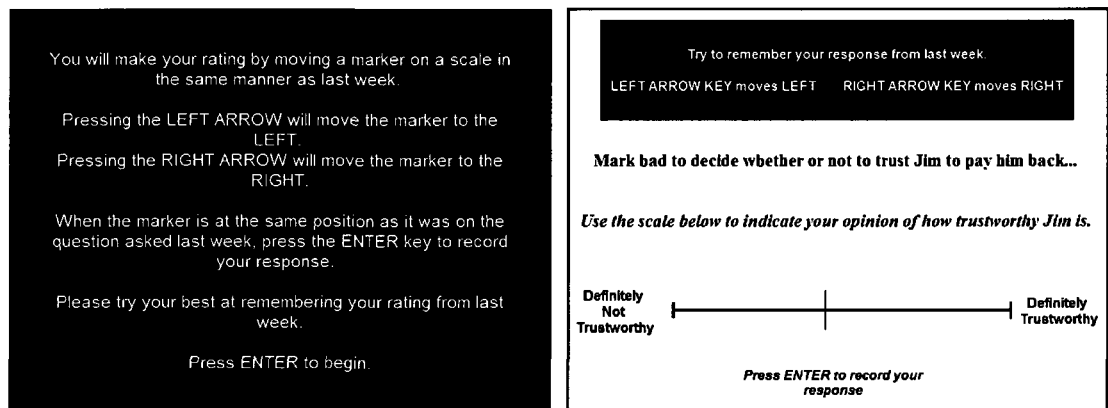


Figure 5: Experiment 1: Example of screens for Session 2 measure of retrospection judgment.

Session 2. During the second session one week later, the participants were again seated at a computer terminal, which simply re-presented the questions from the first session. For the retrospection measure on the money loan scenario, they were asked the following: “Try to remember your response from last week... Mark had to decide whether or not to trust Jim to pay him back... Use the scale below to indicate your opinion of how trustworthy Jim is.” As before, the question appeared just above a continuum that was marked “Definitely not trustworthy” on the left pole and “Definitely trustworthy” on the right. Participants responded by moving a sliding bar from the center to mark their recollection of their original opinion of the target’s trustworthiness, depicted in Figure 5.

Immediately following the retrospection measure, the free recall test was administered. Participants were instructed to turn over a form, which was placed next to their PC and write down all that they could remember from the original vignette onto the form.

After the free recall task, the Interpersonal Trust Scale (ITS, Appendix J) and the Revised Philosophies of Human Nature Scale (RPHN, Appendix K) were administered by computer inventory (see Figure 6) to measure participants' generalized and dispositional expectancies of trust. These were placed at the very end of the trial, rather than before the experiment's primary manipulations and observations, as to not introduce priming effects on our variables of interest, resulting from numerous questions concerning trust.

Please carefully read and use your mouse to respond the following question, by clicking the response you agree with the most...

Most people would stop and help a person whose car was disabled.

Disagree Strongly Disagree Somewhat Disagree Slightly Agree Slightly Agree Somewhat Agree Strongly

CLICK on a response above to advance to the next question

Figure 6: Example of a screen for Session 2, an item in an Interpersonal Trust Measure (Revised Philosophies of Human Nature Scale), used in both Experiments 1 and 2.

Lastly, after the trust measures, participants were fully debriefed, offered an opportunity to respond and ask questions of the experimenter, thanked for their participation and then excused.

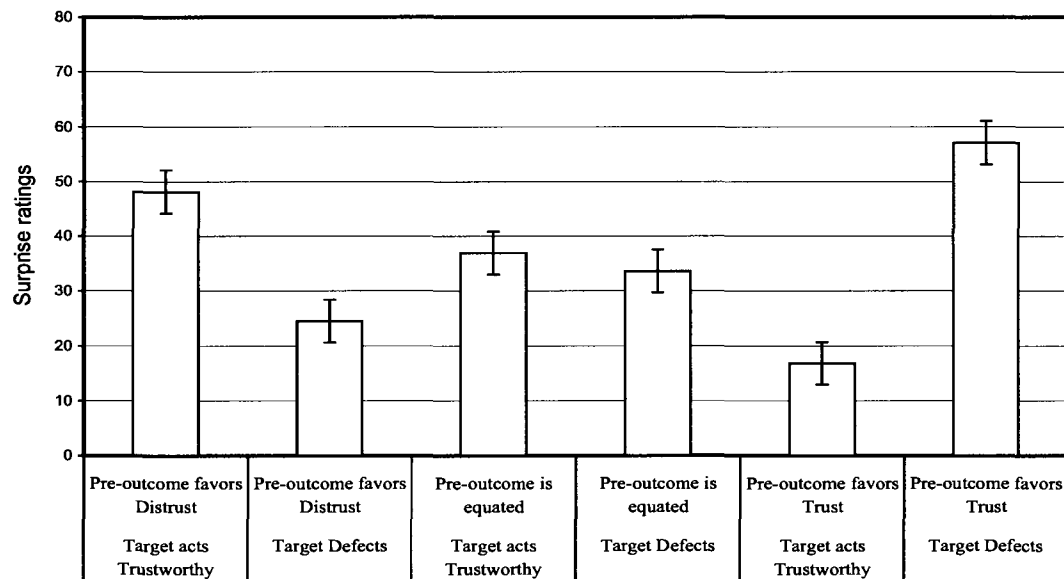
Results

Prediction ratings. To determine whether the pre-outcome scenarios influenced the participants' evaluations of target trustworthiness as intended, the prediction ratings of target trustworthiness prior to learning the outcome were evaluated as a manipulation check. After dropping one participant as an outlier due to very low responses for prediction judgments (z -score > -3), as suggested by Tabachnick & Fidell (2001), one sample t -tests were performed to determine whether estimates of target trustworthiness differed from the midpoint of the scale. Participants who were exposed to the ambivalent conditions ($M=.23$, $SD=15.02$) did not differ significantly from a zero rating, $t(59) = -.11$, $n.s.$, Cohen's $d = -0.02$. In the trust pre-outcome ($M=19.93$, $SD=14.85$), $t(59) = 10.40$, $p < .001$, $d = 1.28$, participant responses were statistically significant in their trending away from zero. By comparison, among those who were exposed to the distrust pre-outcome, participants' estimations (centered at midpoint) of the target's trustworthiness for ($M = -7.73$, $SD = 13.78$) also differed significantly from zero, $t(59) = -4.35$, $p < .001$, $d = -0.74$. When the effect sizes of the trust and distrust conditions were compared, the trust pre-outcome scenarios lead to a 1.73 times greater effect on predictive judgments than did the distrust pre-outcome. This would suggest that the distrust pre-outcome might have been less effective at biasing participants toward the intended outcome.

Surprise ratings. Surprise ratings were used to provide a second check of the validity of the pre-outcome manipulation. A one-way between-subjects ANOVA was used to evaluate responses of the participant's surprise across levels of congruency (incongruent/ambivalent/congruent) as a second set of manipulation checks. If the manipulation was effective, then the participants receiving outcomes that are incongruent with the pre-outcome scenario should show higher surprise ratings. Likewise, those

receiving outcomes that are congruent with the pre-outcome scenario should show lower surprise ratings. Either outcome when combined with the ambivalent pre-outcome scenario should show a central tendency and serve as the baseline condition by which surprise or expectation can be assessed. In other words, in a successful manipulation, the averaged ratings of surprise should fall in the following sequence: congruent < ambivalent < incongruent.

Experiment 1: Means for Surprise



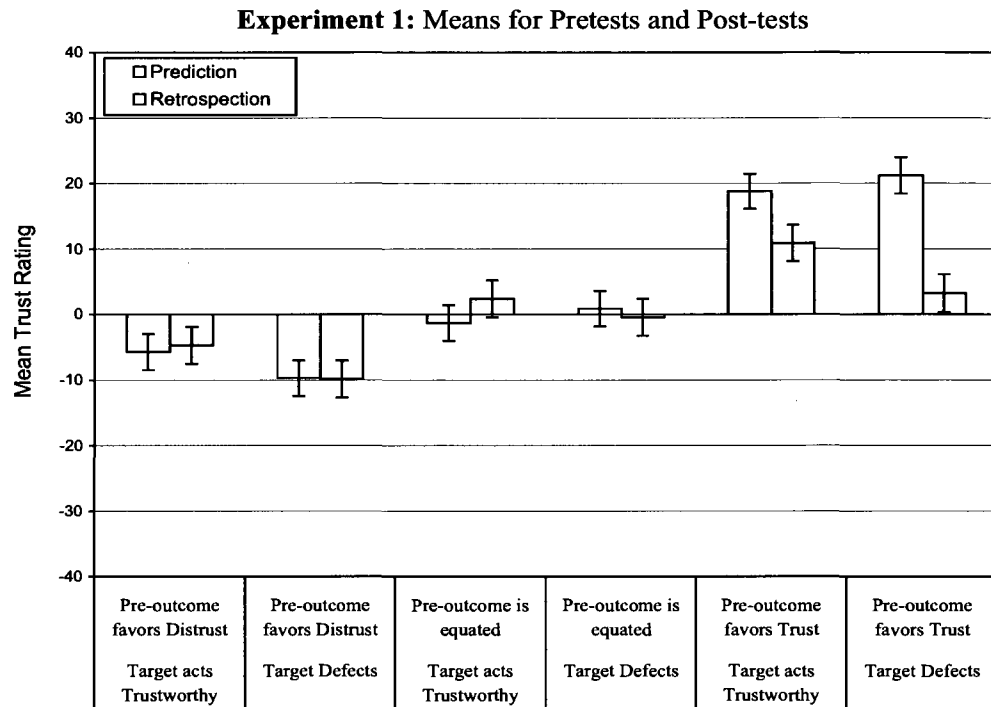
Note: Error bars = Standard Error

Figure 7: Experiment 1: Mean and standard errors of Surprise ratings as a function of pre-outcome and outcome conditions.

Results confirmed that the combinations of pre-outcome and outcome scenarios in the vignettes were successful in manipulating participants' feelings of surprise at the outcome, $F(2, 176) = 32.96, p < 0.001, \eta^2 = 0.28$, with responses indicating that the

incongruent vignettes succeeded in bringing about higher surprise ratings. Planned comparisons (see Figure 7), showed that participants' surprise ratings were highest in the incongruent conditions ($M=52.59$, $SD=20.67$), such as when a trust pre-outcome was paired with a distrust outcome, or a distrust pre-outcome scenario was followed by a trust outcome. Those in the ambivalent conditions ($M=35.27$, $SD=22.48$), where the pre-outcome statements supporting trust and distrust were equated and there was either a trust or distrust outcome, had reported moderate feelings of surprise and significantly lower than those in incongruent conditions, $F(1, 176) = 19.14$, $p < 0.001$, $\eta^2 = 0.10$. The congruent conditions ($M=20.59$, $SD=21.29$) – such as a trust pre-outcome followed by a trust outcome, or distrust pre-outcome paired with a distrust outcome – reported the lowest levels of surprise, displaying significantly lower surprise than in the ambivalent conditions, $F(1, 176) = 14.10$, $p < 0.001$, $\eta^2 = 0.07$.

Hindsight Bias. The presence of hindsight bias among the participant's pre-test and post-test responses was evaluated via a 2 (predictive/retrospective judgment) 3 pre-outcome scenario (trust/ambivalent/distrust) X 2 outcome scenario (trust/distrust) split-plot design ANOVA. Evidence of the hindsight bias was observed when examining judgments of trust, $F(1, 174) = 6.15$, $p < 0.05$, $\eta^2 = 0.03$, as hypothesized (H_1). A significant interaction was found across conditions of prediction/retrospection judgments, pre-outcome and outcome scenarios, $F(2, 174) = 38.19$, $p < 0.001$, $\eta^2 = 0.31$, (see Figure 8). Among the vignettes that had ambivalent pre-outcome scenarios, a very slight hindsight pattern was observed following a trust outcome scenario, $t(29) = -1.78$, *ns*, Cohen's $d = .24$. Also, no effect was observed for vignettes with an ambivalent pre-outcome scenario, followed by a distrust outcome, $t(29) = -.49$, *ns.*, $d = .08$.



Note: Error bars = Confidence interval

Figure 8: Experiment 1: Means and confidence intervals for prediction and retrospection ratings measures as a function of pre-outcome and outcome conditions.

In vignettes with trust pre-outcome scenarios paired with trust outcomes, a congruent condition, participants' retrospection scores fell from their original trust evaluations, in essence showing a significant *reverse hindsight bias* effect, $t(30) = 3.64$, $p < .01$, $d = -.51$. The largest hindsight bias effect of all the results was observed in the vignette when a trust pre-outcome was followed by a distrust outcome, an incongruent condition, $t(28) = -4.49$, $p < .001$, $d = 1.14$. In the vignette with a distrust pre-outcome and a trust outcome, an incongruent condition, no effect was observed, $t(29) = -.41$, *ns*, $d = .07$, which was contrary to our prediction. Lastly, no effect was seen for the distrust

pre-outcome with a distrust outcome, a congruent condition, $t(29) = .06$, *ns*, $d = .01$. This failed to show the reverse hindsight bias effect, which was observed in the previously mentioned congruent condition with the trust pre-outcome scenario and the trust outcome. The prediction (H_2) that hindsight bias effects would be observed in the incongruent and ambivalent conditions, but not the congruent condition, was partially supported, as a statistically significant hindsight bias effect was observed in only one incongruent condition.

Free recall. A free recall memory task was administered to look for patterns or distortions in the participants' memories of pre-outcome information and if these might play a role in producing the hindsight bias effect. Specifically, we were interested to know whether participants who showed hindsight bias effects would recall disproportionately more outcome-supporting information than the proportion that they received in the vignettes. For the free recall analysis, a series of one-way ANOVAs were employed to measure mean differences of recalled information in each condition. Also, using one sample *t*-tests, the proportion of outcome-supporting information that participants recalled from the vignettes was compared to the proportion that was presented in the vignettes to examine for the predicted (H_3) greater recall of outcome-supporting information that were concurrent with observations of hindsight bias.

For the purposes of coding the content of the free recall tasks, the text for the ambivalent version of the money loan vignette was deconstructed into distinct and separate pieces of information or information blocks, (e.g. "Mark has known Jim to be mostly reliable," and "Jim has lied to girlfriends"). This itemized list of the story's content was sorted into three categories. The first category contained situational or neutral pieces of information, with 11 pieces of information from the 9 sentences

describing the situation. The second was trust-supporting information, with 19 items from the 9 sentences that supported trust. The third was distrust-supporting information, with 17 items from the other 9 sentences. The resulting 47 items of information were produced on a rubric for coding. Two research assistants matched content of the written free recall surveys with the itemized list of information blocks on the rubric, to determine which of the items were remembered from the original story. Inter-rater reliability showed to be ample, with Cronbach's alphas of .92 for situational or outcome-neutral coding, .95 for items supporting trust and .96 for items supporting distrust. Scores were averaged between the two sets of data from the coders in order to generate a single dependent variable indicating the amount of information recalled from the story that supported trust, distrust or was outcome-neutral.

The means for the amount of recalled items, shown on Table 1, were examined through a 3 (pre-outcome scenario: trust/ambivalent /distrust) X 2 (outcomes: trust/distrust) factorial between subjects analysis of variance. For these exploratory analyses, ten participants were excluded from this analysis because their data were not analyzable: two had failed to report any outcome-supporting or non-supporting information and eight participants left their recall task sheets blank. In the analysis, no significant differences were detected between groups when examining participants' memories for situational or neutral story information, $F(2, 164) = 1.49, ns$, nor from memories of trust-supporting items $F(2, 164) = 2.97, ns$, as well as distrust-supporting items $F(2, 164) = .97, ns$. It should be noted that, having struck five sentences from the congruent and incongruent conditions, these groups received approximately 30% less information than did the ambivalent group. Therefore, it is noteworthy that there were not

significant differences between groups for information that was remembered during the free recall task.

Table 1:

Experiment 1: Means and Standard Deviations for Recalled Information in Free Recall tasks, as a Function of Pre-outcome, Outcome Scenarios and Type of Information.

Variables	Situation Supporting		Trust-supporting		Distrust-supporting	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pre-outcome: Distrust / Outcome: Trust ^a	2.98	1.51	3.55	1.52	1.96	1.15
Pre-outcome: Distrust / Outcome: Distrust ^b	2.72	1.56	2.59	1.19	2.69	1.77
Pre-outcome: Ambivalent / Outcome: Trust ^c	2.73	1.61	3.70	1.77	1.54	1.39
Pre-outcome: Ambivalent / Outcome: Distrust ^c	3.25	1.24	3.68	1.91	2.98	1.79
Pre-outcome: Trust / Outcome: Trust ^b	3.12	1.12	5.09	2.33	.70	.86
Pre-outcome: Trust / Outcome: Distrust ^a	2.85	1.16	3.46	1.62	1.88	1.14

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*

Next, the proportions of outcome-supporting information that the participants recalled from their vignettes (see Table 2) were compared against the proportions of

outcome-supporting information that was presented to them in the various conditions (Table 3).

Table 2:

Experiment 1: Means for Outcome Supporting and Non-Outcome-Supporting Recalled Information with Comparison Ratios, as a Function of Pre-outcome and Outcome Scenarios.

Variables	<i>M (SD)</i> Outcome-supporting items		<i>M (SD)</i> Non-outcome-supporting items		<i>M (SD)</i> Total of Outcome-supporting and Non-outcome-supporting items		Comparison Ratio: Recalled ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Pre-outcome: Distrust / Outcome: Trust ^a	3.55	1.52	1.96	1.15	5.51	1.95	0.66
Pre-outcome: Distrust / Outcome: Distrust ^b	2.69	1.77	2.59	1.89	5.28	2.37	0.49
Pre-outcome: Ambivalent / Outcome: Trust ^c	3.70	1.77	1.54	1.39	5.24	2.56	0.74
Pre-outcome: Ambivalent / Outcome: Distrust ^c	2.98	1.79	3.68	1.91	6.66	3.12	0.45
Pre-outcome: Trust / Outcome: Trust ^b	5.09	2.33	0.71	.89	5.80	2.63	0.88
Pre-outcome: Trust / Outcome: Distrust ^a	1.81	1.14	3.35	1.61	5.16	2.33	0.34

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*, ^d Comparison ratio = Outcome-supporting recalled / Total of outcome-supporting and outcome-non-supporting information recalled

Table 3:

Experiment 1: Means for Outcome Supporting and Non-Outcome-Supporting Information Presented in the Vignettes with Comparison Ratios, as a Function of Pre-outcome and Outcome Scenarios.

Variables	Outcome-congruent items	Outcome-incongruent items	Total of congruent and incongruent items	Comparison Ratio: Presented ^a
Pre-outcome: Distrust / Outcome: Trust ^a	4	17	21	0.19
Pre-outcome: Distrust / Outcome: Distrust ^b	17	4	21	0.81
Pre-outcome: Ambivalent / Outcome: Trust ^c	19	17	36	0.53
Pre-outcome: Ambivalent / Outcome: Distrust ^c	17	19	36	0.47
Pre-outcome: Trust / Outcome: Trust ^b	19	4	23	0.83
Pre-outcome: Trust / Outcome: Distrust ^a	4	19	23	0.17

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*, ^d Comparison ratio = Outcome-supporting recalled / Total of outcome-supporting and outcome-non-supporting information recalled

These comparison ratios would be examined by *t*-tests, to make determinations as to whether participants showing hindsight effects retained proportionately more or less outcome-supporting information than what was given to them. Comparison ratios were established for recalled information by dividing the amount of outcome-supporting items that was recalled, by the sum of the outcome-supporting and the non-outcome-supporting

information that was recalled by the participants. These ratios were measured against corresponding comparison ratios for presentations, which were simply the total outcome-supporting information presented, divided by the sum of the outcome-supporting and non-outcome-supporting information that was presented.

Table 4:

Experiment 1: Means, T-tests and Effect Sizes for Free Recall Tasks and Comparisons

Variables	<i>N</i>	Comparison Ratio: Recalled	Comparison Ratio: Presented	<i>t</i> ^{<i>d</i>}	Cohen's <i>d</i> ^{<i>e</i>}
Pre-outcome: Distrust / Outcome: Trust ^{<i>a</i>}	28	0.66	0.19	13.37***	1.74
Pre-outcome: Distrust / Outcome: Distrust ^{<i>b</i>}	29	0.49	0.81	8.32***	-1.48
Pre-outcome: Ambivalent / Outcome: Trust ^{<i>c</i>}	28	0.74	0.53	5.50***	1.19
Pre-outcome: Ambivalent / Outcome: Distrust ^{<i>c</i>}	28	0.45	0.47	-0.48	-0.13
Pre-outcome: Trust / Outcome: Trust ^{<i>b</i>}	29	0.88	0.83	1.60	0.42
Pre-outcome: Trust / Outcome: Distrust ^{<i>a</i>}	28	0.34	0.17	4.72***	1.09

^{*a*} = *Incongruent*, ^{*b*} = *Congruent*, ^{*c*} = *Ambivalent*, ^{*d*} = one sample, *** = $p < .001$ (2 tailed), ^{*e*} Cohen's $d > 0$ indicates higher proportion of recalled information than presented.

One-sample *t*-tests were used to examine whether the proportion of recalled outcome-supporting items differed significantly from that which was in the presented information (shown on Table 4). These comparisons showed that in both incongruent conditions, where pre-outcome scenario suggested a different outcome than what happened, participants recalled a significantly higher amount of outcome-supporting information. A similar pattern in one ambivalent condition was observed, where the target behaved trustworthy in the outcome. In one congruent condition, where the pre-outcome scenario suggested a non-trustworthy target that ultimately defected, participants recalled a significantly lower proportion of outcome supporting information than was presented to them. No significant differences were observed in any other conditions, including the congruent condition where the pre-outcome scenario depicted a trustworthy target that behaved trustworthy in the outcome.

Trust inventories. To examine whether individual differences in generalized trust expectancies influenced hindsight bias responses, various analyses were used. In addition to checks for reliability, a correlation analysis was used to explore for possible relationships between key measures such as participants' feelings of surprise at the outcome, as well as hindsight bias measurements.

An examination of both trust inventories indicated that reliability was within the margins of acceptability for both the Interpersonal Trust Scale (Cronbach's $\alpha = .71$) and the Revised Philosophy of Human Nature (RPHN) Inventory ($\alpha = .64$), as well as the RPHN subscales for both Trust ($\alpha = .76$) and Cynicism ($\alpha = .67$). These indicators for generalized interpersonal trust, viewable on Table 5, were strongly correlated with one another, as expected, $r(179) = .45, p < .001$.

Table 5:

Experiment 1: Means, Standard Deviations, Skew and Kurtosis for the Measures of Generalized Trust expectancies.

Variable	Mean	SD	Skewness	Kurtosis
Interpersonal Trust Scale (ITS)	60.50	7.73	-.37	.36
Revised Philosophy of Human Nature Inventory - TRUST subscale	-0.24	9.03	-.05	-.33
Revised Philosophy of Human Nature Inventory - CYNICISM subscale	6.77	7.67	-.50	.97
Revised Philosophy of Human Nature Inventory (PHN)	-7.01	12.09	-.06	.41

The participants' responses to these inventories were examined to insure that responses were not affected by the experimental manipulation. A factorial 3 (pre-outcome scenarios: trust/ambivalent/distrust) X 2 (outcome scenarios: trust/ distrust) ANOVA served as a test for independence for the ITS and the RPHN, revealing no main effects or interactions, indicating minimal effects on the responses from the exposure to the vignettes and questions, all F 's ≤ 2 (Tables 6 and 7).

Table 6:

Experiment 1: Analysis of Variance Source Table for ITS measures.

Source	<i>df</i>	<i>F</i>	<i>partial η^2</i>	<i>p</i>
Pre-Outcome	2	.68	.01	.51
Outcome	1	1.52	.01	.22
Pre-Outcome * Outcome	1	.36	.00	.70
Error	174			

Table 7:

Experiment 1: Analysis of Variance Source Table for RPHN measures.

Source	<i>df</i>	<i>F</i>	<i>partial η^2</i>	<i>p</i>
Pre-Outcome	2	.39	.01	.68
Outcome	1	.40	.00	.53
Pre-Outcome * Outcome	1	2.01	.02	.14
Error	174			

An important question in this research was whether predispositions toward trust behaviors might influence patterns of trust-related hindsight bias effects. Therefore, an analysis of covariance (ANCOVA) was constructed to examine the dependent variable of hindsight bias effects, which was calculated using the mean differences between participant's prediction and retrospection scores and adjusted for directionality (i.e., scores in the distrust outcome condition were multiplied by -1). The ANCOVA entered in the interaction terms of the experimental variables to determine if the magnitude of participants' hindsight bias effects were moderated by generalized trust dispositions.

The ANCOVA with ITS as the covariate showed no relationship between ITS scores and hindsight bias effects and no interactions between ITS and any of the experimental variables. Likewise, the RPHN indicated no relationship with hindsight bias effects or interactions with the experimental variables, all F 's < 1 (see Tables 8 and 9).

Table 8:

Experiment 1: Analysis of Covariance for Hindsight Bias Effects with ITS as a Covariate.

Source	df	F	$partial \eta^2$
ITS (cv)	1	.76	.01
Pre-Outcome * ITSscore	2	.85	.01
Outcome * ITSscore	1	.02	.00
Pre-Outcome * Outcome * ITS	2	.20	.00
Error	168		

Table 9:

Experiment 1: Analysis of Covariance for Hindsight Bias Effects with RPHN as a Covariate.

Source	<i>df</i>	<i>F</i>	<i>partial η²</i>
RPHN (cv)	1	.72	.00
Pre-Outcome * RPHN	2	.18	.00
Outcome * RPHN	1	.04	.00
Pre-Outcome * Outcome * RPHN	2	.76	.01
Error	168		

** $p < .01$, *** $p < .001$.

A similar ANCOVA for surprise-ratings (see Table 10) revealed a significant two-way interaction between the ITS and surprise for conditions of outcome, $F(1,167)=3.17, p<.05$. The ANCOVA examining surprise-ratings as adjusted by the RPHN (Table 11) did reveal a significant three-way interaction of between pre-outcome and outcome conditions as moderated by RPHN, $F(2,167)=3.07, p<.05$. Results were mostly uncorrelated between the ITS and RPHN when compared against the measures for surprise and participant's hindsight bias responses (see Tables 12 and 13). The single exception was a significant negative correlation between the RPHN measure and surprise for the trust pre-outcome scenario with the trust outcome, $r(29) = -.40, p<.05$.

Table 10:

Analysis of Covariance for surprise with ITS as a Covariate in Experiment 1

Source	<i>df</i>	<i>F</i>	<i>partial η²</i>
ITS (cv)	1	.04	.00
Pre-Outcome * ITSscore	2	3.17*	.04
Outcome * ITSscore	1	.60	.00
Pre-Outcome * Outcome * ITS	2	.88	.01
Error	167		

* $p < .05$

Table 11:

Analysis of Covariance for surprise with RPHN as a Covariate in Experiment 1

Source	<i>df</i>	<i>F</i>	<i>partial η²</i>
RPHN (cv)	1	2.15	.01
Pre-Outcome * RPHN	2	1.64	.02
Outcome * RPHN	1	.09	.00
Pre-Outcome * Outcome * RPHN	2	3.07*	.00
Error	167		

* $p < .05$, *** $p < .001$.

Table 12:

Correlations comparing the ITS against Surprise and Hindsight Effects in Experiment 1 (Money Loan Story)

Outcome	Pre-outcome story: Distrust		Pre-outcome story: Ambivalent		Pre-outcome story: Trust	
	Surprise	HSB	Surprise	HSB	Surprise	HSB
	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>
Trustworthy	.23 (.24)	-.01 (.98)	-.34 (.07)	.05 (.80)	.01 (.96)	-.25 (.18)
Defection	-.06 (.77)	-.09 (.65)	-.19 (.44)	-.08 (.68)	.34 (.07)	-.12 (.54)

Table 13:

Correlations comparing the RPHN against Surprise and Hindsight Effects in Experiment 1 (Money Loan Story)

Outcome	Pre-outcome story: Distrust		Pre-outcome story: Ambivalent		Pre-outcome story: Trust	
	Surprise	HSB	Surprise	HSB	Surprise	HSB
	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>	<i>r (p)</i>
Trustworthy	.32 (.09)	-.03 (.88)	-.29 (.12)	.01 (.95)	-.40* (.03)	-.26 (.16)
Defection	-.14 (.47)	-.20 (.28)	-.18 (.35)	-.02 (.91)	.05 (.80)	-.05 (.80)

* $p < .05$

Discussion

Experiment 1 supported our first hypothesis that judgments of trust are susceptible to hindsight bias effects, much the same as are other judgments under uncertainty. Hindsight bias was observed on ratings of trustworthiness on the average, across all conditions.

Our second hypothesis was partially supported, as a very large effect was observed in one of the predicted conditions: the incongruent condition where the pre-outcome scenario supported trust in the target, who defected in the outcome. Previous research has shown that negative outcomes can yield larger hindsight bias effects when compared to positive outcomes (Guilbault, et al., 2004). Because a trust betrayal is a serious norm violation (Barber, 1983; Lewicki, McAllister, & Bies, 1998) and is generally considered a very negative outcome, it may receive hardy and well-motivated processing during sense-making cognitions (Baumeister, et al., 2001). Also, outcomes that are considered to be task failures, i.e., the failure to repay the obligation of a loan, are theorized to motivate the cognitive explanation processes that implicated in sense-making (Anderson, et al., 1996; DiFonzo & Bordia, 2007).

A betrayal outcome in a vignette could also activate a sense of personal relevance on the part of the participant, if they have had prior experience, are familiar, or can identify with being betrayed. This could invite emotional arousal and lead to robust cognitive activity during sense-making, which could manifest in an increased effect size within the assumptions of the sense-making model and in turn bring about the strong effect shown among these participants. Personal relevance has been theorized to lead to increased effect sizes in hindsight research; however a recent meta-analysis observed

mixed results for this factor, perhaps because of too few studies being available and subsequent lack of statistical power (Guilbault, et al., 2004). In this experiment, no questions were asked of the participants about whether or not they had personal or prior experience of a similar betrayal as depicted in the vignette. This dimension remains an interesting opportunity for further examination. Subsequent research into hindsight bias during trust decisions may do well to include history questions addressing personal relevance to explore it as an independent variable.

In the incongruent condition with the distrust pre-outcome followed by the trust outcome, results showed no evidence of hindsight bias effects. This pattern was not predicted in our hypothesis (H₂) and is a departure from previous research (Ash, 2009) where hindsight patterns were witnessed during incongruent outcome conditions. One possible explanation for the failure to find hindsight bias effects in this incongruent condition may be that the distrust pre-outcome scenario did not sufficiently bias the participants toward the intended outcome. Recall that the distrust pre-outcome scenario had a much smaller effect on predictive ratings when compared to the trust pre-outcome. Furthermore, the difference between the surprise ratings for incongruent and congruent outcomes was smaller for the distrust pre-outcome than for the trust pre-outcome.

A possible explanation for the lack of biasing may be insufficient motivation among the participants for sense-making cognitions, which were needed for participants to seek to explain the story (Anderson, et al., 1996), despite the fact they did rate the outcome as surprising. Anderson et al. (1996) observed that cognitive explanation processes are more associated with a task failure than not, which may explain the higher bias observed in the incongruent condition where the target defaulted as compared with this condition where the target repaid the debt.

Also, there are strong social and normative contexts regarding the sustainment of trust (Barber, 1983; Lewicki, et al., 1998) – not the least of which is that trustworthy behavior is a foundational and general expectation on the part of society. In this context, a distrust pre-outcome scenario paired with a trust outcome, despite being surprising, may not invite sense-making in that such an outcome may seem expected and proper in hindsight in light of the social mandate toward trustworthy conduct, as the loan repayment would be modeled in the cognitions of the participants as more proper and right-minded behavior.

Previous hindsight bias research has indicated that surprise does not appear solely to drive hindsight bias, as surprise responses and hindsight bias effects show little correlation (Ash, 2009). In that light, this instance supports the view that more is required to initiate sense-making than just surprise alone. Perhaps very little (if any) sense-making may have been required to explain repaying an informal loan for a trivial amount of money. To that extent, such an outcome may have been perceived as a “non-event.” It may not require more of an explanation past the fact that trust was upheld and the small loan was repaid and therefore show a constrained effect. Hindsight bias research has indicated that recollections of non-events often show reduced hindsight bias effects (Guilbault, et al., 2004; Wasserman, Lempert, & Hastie, 1991). Follow-ups and replications of this experimental design may do well to pay more attention the degree of biasing in the manipulations and produce pre-outcome scenarios with content that sufficiently invites or motivates sense-making.

A fascinating result was the “reversed hindsight bias” effect found in the congruent condition that supported trust in the pre-outcome scenario and had a trustworthy outcome. The hypothesized sense-making theories, which predicted no

effects in this condition, failed to predict or explain these results. We will return to briefly deliberate this effect in the general discussion section of this paper.

The free recall measures showed memory biases among participants in the incongruent conditions, where those exposed to stories leading to unexpected or surprising outcomes recalled a higher proportion of outcome-supporting information than was actually presented in the vignettes. In addition to the incongruent conditions, there was a similar pattern in the equated condition where the target acted trustworthy, showing a significantly elevated ratio of recalled information. In all three of these conditions only one, the trust-favoring congruent condition, also showed a significant hindsight bias effect. Our hypothesis was partially supported in that the elevated recall comparison ratios were observed on both incongruent conditions and one ambivalent condition. These did not match the pattern of hindsight biases as predicted as only one of the incongruent conditions showed the hindsight bias effect. This exploration measure only is designed to analyze trends in the recall of presented vignette information, and not necessarily to capture all cognitions from a judgment or recollection. As such, the free recall task, while showing predicted trends in the recall proportions of outcome-supporting information from an incongruent condition, may be unequipped to make complete determinations about whether or not successful sense-making occurred. When taking into account the insufficient biasing in this condition that mentioned earlier, this elevated trend in the free recall task and the lack of hindsight bias may not be self-contradictory, if motivated and successful sense-making did not happen. In this context, it could possibly act as a “false-positive.”

Finally, the exploratory analysis for generalized trust measures revealed no relationship between these traits and our variables of interest. In one inventory, the

RPHN, there was a single significant negative correlation between that trust inventory and the surprise measure, in the congruent condition favoring trust in the target. It seems intuitively reasonable to expect that a generally trusting participant would not feel surprise that a trustworthy target would uphold trust. That the correlation would occur here and in a condition that only saw modest reports of surprise, suggests this not to be a meaningful result.

It is noteworthy that the measures for both inventories are designed to access metacognitive attitudes of high personal relevance, which were socially learned, to obtain a measure on an individual's attitudes regarding trust (Rotter, 1971; Wrightsman, 1992). The third-person vignettes trust depicted in the experiment may well be modeled quite differently in the minds of the participants than more personally relevant or first person judgments of trust. The overall lack of a relationship between the trust inventories and the hindsight bias responses – or even the surprise measures – suggests that these generalized trust expectancies do not tap into the operational mechanisms that affect the types of judgments as were measured here and may well be an incorrect instrument for measuring individual differences in cognitions in the context of third-person trust observations.

EXPERIMENT 2

The goal of this experiment was to continue an examination as to whether trust judgments are susceptible to hindsight bias effects, as are other judgments under uncertainty. Experiment 2 replicated the previous experiment with improvements in the manipulation, including a better-balanced presentation of the pre-outcome scenarios that were corrected for insufficient biasing in the distrust condition that was seen in Experiment 1. Participants were exposed to a new set of vignettes of an interpersonal trust decision depicting a decision of a small business owner as he deliberated the hiring of a friend. As before, individual differences regarding trust were also examined to investigate how they might moderate hindsight bias effects.

Method

Participants

One hundred and eighty-three participants were recruited from the volunteer participant pool of students at Old Dominion University. As before, mostly young adults were in this convenience sample, with 172 (94%) of the volunteers were between the ages of 18 and 24 and 11 (6%) were between 26 and 42 years of age. The volunteers were mostly female, with 131 women (71.6%) and 52 men (28.4%) participating in the trials. Nearly all participants showed a mastery of English: with 171 (93.4%) reporting that English was their primary language; five (2.7%) reported that English has been their primary language for more than a decade; one (<1%) stating that English has been the primary language for less than five years and three participants (1.6%) indicating that English is not their primary language.

Apparatus

All materials and procedures in Experiment 2 remained identical to those used in Experiment 1, with the exception of the pre-outcome and outcome scenarios in the vignettes, as well as the survey questions about those vignettes. For this experiment, Story 2 from the pilot study, the vignette depicting the quandary of a small business owner in hiring a friend (see Appendix L) was used in place of Story 1.

Design and Procedure

The measures and analyses were designed the same way as in Experiment 1: a split-plot design 2 (predictive / retrospective judgment) X 3 pre-outcome scenario (trust/ambivalent /distrust) X 2 outcome scenario (trust/distrust) analysis of variance (ANOVA), with post-hoc tests, contrasts, planned comparisons and non-parametric analysis as necessary.

LEFT ARROW KEY moves LEFT RIGHT ARROW KEY moves RIGHT

John had to decide whether or not to trust Chip to work for him at his small business...

Use the scale below to indicate your opinion of how trustworthy Chip is.

Definitely Not Trustworthy

Definitely Trustworthy

Press ENTER to record your response

Figure 9: Experiment 2: Example of screen for the Session 1 measure of prediction judgment.

As before, the volunteers were measured in two sessions, exactly one week apart. Participants were recruited using the same the SONA research participation system and recruitment fliers as in Experiment 1. A total of 255 participants signed up during the run of the project, which was three semesters in duration. Thirty-six participants (14%) were dropped because they did not show for the second session, 26 (10%) were dropped due to data collection errors³, 8 participants (3%) lost their data due to a malfunctioning lab computer and one participant (<1%) was dropped as an unreliable respondent due to conflicting demographic information provided in Sessions 1 and 2. Participants who volunteered for the pilot study, Experiment 1, or any similar experiment studying hindsight bias effects were excluded. This left 183 participants, who received two research credits, one for each appointment/hour, as compensation for their participation in both sessions.

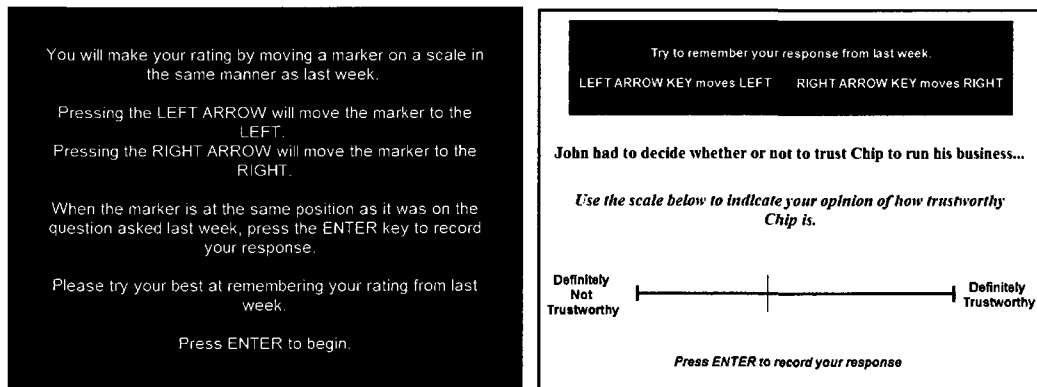


Figure 10: Experiment 2: Example of screens for Session 2 measure of retrospection judgment.

³ Types of data collection errors include: 12 participants (5%) were assigned to wrong procedure on computer during second session and 14 participants (5%) were accidentally double-booked computer lab for the second session.

The prediction inquiry will be “John had to decide whether or not to trust Chip to run his small business... Use the scale below to indicate your opinion of how trustworthy Chip is,” (Figure 9). The surprise manipulation check posed: “How surprising was it that Chip turned out to be a good employee?” if the target proved trustworthy in the outcome, or, if he defected, “How surprising was it that Chip turned out to be a bad employee?”

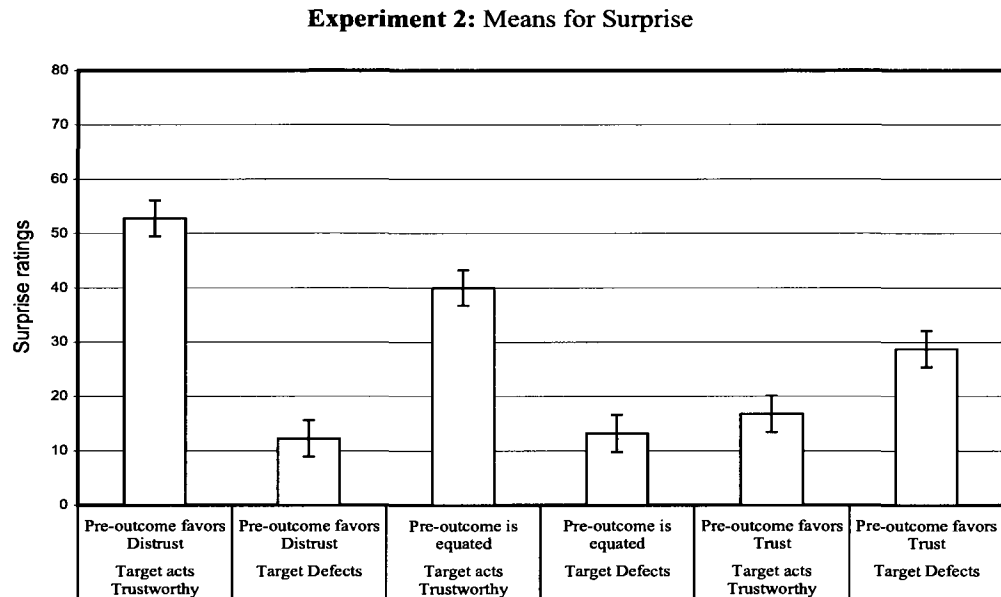
One week later in Session 2, the retrospection question (Figure 10) asked: “Try to remember your response from last week... John had to decide whether or not to trust Chip to work for him at his small business... Use the scale below to indicate your opinion of how trustworthy Chip is.”

Again, as in Experiment 1, exploratory tests (trust inventories and the free recall task) were administered before debriefing and excusing the participants in session 2.

Results

Prediction ratings. As in Experiment 1, predictive ratings were analyzed to assess whether the manipulations to the pre-outcome scenarios had their intended effects on participants expectations. Indeed, these conditions in this experiment showed more balanced effects than in Experiment 1. Participants exposed to the trust pre-outcome, ($M=10.57$, $SD=15.14$), predicted a trustworthy target, $t(60) = 5.46$, $p<.001$, Cohen’s $d = 0.89$ and differed significantly from zero, as did those exposed to the distrust pre-outcome scenario ($M=-14.59$, $SD=12.29$), who predicted a strongly non-trustworthy target, $t(60) = -9.28$, $p<.001$, $d = -1.29$. However, a deviation in effect size was observed in the ambivalent condition, where participants prediction ratings ($M=-8.95$, $SD=14.88$) were significantly less trusting of the target compared to the midpoint, $t(60) = -4.70$, $p<.001$, $d = -0.79$ and showed a similar direction of the bias with the distrust pre-outcome scenarios. While the sizable effect showing bias toward distrust in the ambivalent

condition is a noteworthy issue, the analysis indicated an improved balance in the effects of our variables of interest compared to Experiment 1, closing the gap to a 45% difference in Cohen's *d* effect sizes between the biases in the distrust and trust pre-outcome.

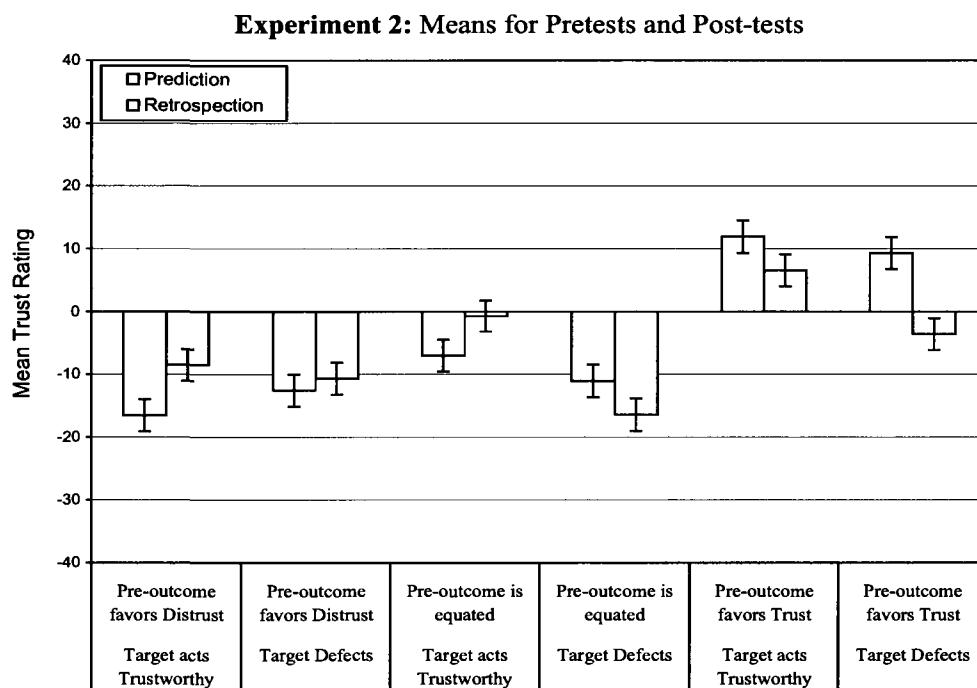


Note: Error bars = Standard Error

Figure 11: Experiment 2: Mean and standard errors of Surprise ratings as a function of pre-outcome and outcome conditions.

Surprise ratings. To evaluate responses of the participant's surprise across levels of congruency, the surprise ratings across the levels of pre-outcome and outcome scenarios were again made through use of a one-way between-subjects ANOVA. Results confirmed that the pre-outcome and outcome combinations showed success in manipulating the surprise ratings across levels of congruency (i.e. congruent <

ambivalent < incongruent), $F(2, 177) = 33.09, p < 0.001, \eta^2 = 0.27$, as shown in Figure 11. The congruent conditions, where pre-outcome scenario led to expected outcomes, indicated significantly less surprise than the ambivalent conditions, $F(1, 177) = 12.94, p < 0.001, \eta^2 = 0.07$, as well as incongruent conditions, $F(1, 177) = 61.56, p < 0.001, \eta^2 = 0.26$.



Note: Error bars = Confidence interval

Figure 12: Experiment 2: Means and confidence intervals for prediction and retrospection ratings measures as a function of pre-outcome and outcome conditions.

Though participants' surprise was generally higher in the incongruent conditions and lower in congruent conditions, planned comparisons indicated mixed results among the levels of surprise in each outcome condition and especially so in the ambivalent

conditions. Among the surprise ratings of the vignettes with the trust-supporting pre-outcome scenarios, as seen in Figure 12, there was a significant (and expected) difference between the vignettes, where the distrust outcome scenario showed higher surprise than the trust outcome, $F(1, 177) = 6.38, p < 0.05, \eta^2 = 0.04$. For the distrust pre-outcome scenarios, a strong difference was also observed between the vignette with the trust outcome, which showed significantly higher surprise than the vignette with the distrust outcome, $F(1, 177) = 73.46, p < 0.001, \eta^2 = 0.29$. In the ambivalent vignettes, a similar and interesting pattern was observed: the vignette with the distrust outcome also showed significantly less surprise than the vignette with the trust outcome, $F(1, 177) = 31.94, p < 0.001, \eta^2 = 0.15$. When comparing the vignettes of the ambivalent pre-outcome scenarios to the distrust pre-outcomes, less surprise was observed in the ambivalent vignette with a trust outcome, $F(1, 177) = 7.57, p < 0.01, \eta^2 = 0.04$., yet there were virtually no differences in surprise reactions to vignettes with the distrust outcome, $F(1, 177) = .04, n.s.$ This would suggest only moderate differences between the trust pre-outcome scenarios and those pre-outcome scenarios that were intended to be ambivalent.

Hindsight Bias. To investigate the effects of pre-outcome scenario and outcome congruence on hindsight bias effects, a 2 (judgment: prediction/retrospection) X 3 (pre-outcome: trust/ambivalent/distrust) X 2 (outcome: trust/distrust) split-plot ANOVA was computed. Results revealed a significant main effect of judgments overall, $F(1,177) = 15.24, p < .001, \text{partial } \eta^2 = .08$. When collapsing across experimental conditions, the mean retrospective judgments ($M=4.47, SD=15.91$) were more in favor of the given outcome than were the mean predictive judgments ($M= .16, SD=18.27$). This finding is consistent with our predictions (H_1) and replicates the pattern from Experiment 1.

There was also a significant three-way interaction, $F(2,177) = 39.51, p < .001$, partial $\eta^2 = .31$. To investigate the nature of this interaction, a series of planned comparisons were conducted to assess the significance and direction of hindsight effects in each condition.

In the vignettes with a trust pre-outcome scenario that was paired with the distrust outcome, an incongruent condition, a strong hindsight bias effect was observed, $t(30) = -4.20, p < .05, d = .89$. A pattern of “reverse hindsight bias” was observed again in the vignette with a trust pre-outcome and a trust outcome, a congruent condition, $t(29) = 2.38, p < .05, d = -.39$, where retrospective evaluations the target’s trustworthiness fell from what was originally cited in predictions. This replicated the reverse hindsight pattern found in Experiment 1. In the vignettes with a pre-outcome scenario of distrust, significant hindsight bias effects were observed for the trust outcome scenario, $t(30) = -3.25, p < .01, d = .62$ and not observed for the distrust outcome, $t(29) = .68, n.s., d = .13$. Similar patterns were observed among the vignettes that had ambivalent pre-outcome scenarios: a significant hindsight bias effect was observed in one of the ambivalent conditions with the trust outcome, $t(31) = -2.71, p < .05, d = .43$. This effect is consistent with the previous observations from the predictive judgments. No hindsight bias was observed with the ambivalent pre-outcome and distrust outcome scenarios, $t(28) = -1.80, n.s. d = .37$. Given our assumptions about sense-making and hindsight biases, this repeated pattern may not seem surprising, as similar patterns in predictive judgments were seen between in the ambivalent vignettes and those that had pre-outcome scenarios depicting a non-trustworthy target. Because the pre-outcome scenario led to a bias toward distrust among the participants, these conditions should be viewed as incongruent rather than ambivalent conditions. As such, these results confirmed our predictions of

interactions of hindsight bias in judgments of trust, which were influenced by outcome congruency (H₂).

Free recall. Just as in Experiment 1, the story's content was broken down and sorted into neutral, trust-supporting and distrust-supporting information blocks. There were 28 pieces of information pulled from the 11 sentences that were neutral in describing the situation. Despite the equal number of sentences in the vignette between the trust-supporting and distrust-supporting sets, the deconstruction of these sentences into separate pieces of information showed a strong asymmetry between the two sets, due to differences in the content and sentence construction between the trust and distrust-supporting sentences. From the nine trust-supporting sentences, 28 pieces of information were found; and from the other nine sentences that depicted the target as non-trustworthy, 45 separate pieces of information were tallied. This was due to a prevalence of distrust-supporting sentences that were compound sentences holding multiple pieces of information (e.g.: "John knows Chip is a guy who 'has some problems' and has struggled with alcohol and cocaine use over the years, which has cost him some friends over time"). This contributed to considerably fewer trust-supporting pieces of information than distrust-supporting pieces in the vignette. Such an inequality may explain the asymmetrical levels of surprise in the ambivalent conditions, which were discussed earlier, suggesting generally disfavorable estimations of target trustworthiness on the parts of the participants who were given "ambivalent" versions of the story.

A total of 102 items of information were produced on a rubric for coding. Two research assistants matched up content of the written free recall surveys with the itemized list of information blocks on the rubric, to determine which of the items were remembered from the original story. Cronbach's alphas of .93 for situational or outcome

neutral coding, .92 for items supporting trust and .95 for items supporting distrust indicated strong inter-rater reliability, similar to Experiment 1. Therefore, the scores were again averaged between the two sets of data from the coders, to generate a dataset for a dependent variable indicating amounts of recalled-information that supported trust, supported distrust, or was situational in nature.

The amount of recalled pre-outcome information was examined through a factorial between subjects, 3 pre-outcome scenario (trust/ambivalent/distrust) X 2 outcome scenarios (trust/distrust) ANOVA. Six participants were excluded from the analysis: one participant did not report outcome-supporting or non-supporting information and five others left no responses on their recall task sheets. No significant interactions were noted between groups (see Table 14) when examining participants' memories for situational or neutral story information, $F(2, 173) = .09, ns$, nor from memories of trust-supporting items $F(2, 173) = .46$, as well as distrust-supporting items $F(2, 173) = 1.08, ns$. There was a main effect seen for conditions of pre-outcome scenario $F(1, 173) = 33.71, p < .001$, where participants who had read a trust-supporting pre-outcome scenario ($M=4.03, SD=2.01$) and in the ambivalent conditions ($M=4.12, SD=2.33$), were significantly more likely to recall more trust-related items than those who had read the distrust pre-outcome scenario, ($M=3.12, SD=1.59$). This would be expected since participants in those two conditions were given more trust-related information than those in the distrust pre-outcome scenarios. There was also a main effect observed for trust-related items across conditions of outcome, $F(1, 173) = 33.71, p < .001$, when those who were exposed to a outcome where the target was trustworthy recalled significantly more trust-related pieces of information on the average ($M=4.55, SD=2.22$) than distrust-related information ($M=2.94, SD=1.50$). These differences across the conditions are

interesting in that each pre-outcome scenario received a uniform amount of trust-related information.

Table 14:

Experiment 2: Means and Standard Deviations for Recalled Information in Free Recall tasks, as a Function of Pre-outcome, Outcome Scenarios and Type of Information.

Variables	Situation Supporting		Trust-supporting		Distrust-supporting	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pre-outcome: Distrust / Outcome: Trust ^a	4.27	2.09	3.90	1.59	4.03	2.08
Pre-outcome: Distrust / Outcome: Distrust ^b	3.83	2.03	2.31	1.28	7.05	3.23
Pre-outcome: Ambivalent / Outcome: Trust ^c	4.77	2.34	4.73	2.71	3.81	2.46
Pre-outcome: Ambivalent / Outcome: Distrust ^c	4.33	2.53	3.43	1.61	7.83	3.41
Pre-outcome: Trust / Outcome: Trust ^b	4.78	2.32	5.02	2.09	3.12	1.49
Pre-outcome: Trust / Outcome: Distrust ^a	4.03	2.29	3.07	1.40	7.57	3.08

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*

For the distrust-related recall items, there were significant differences in all groups depending on the outcome, $F(1, 173) = 89.40, p < .001$, with participants recalling more distrust related items if they received a distrust outcome ($M=7.48, SD=3.21$) than those who were exposed to a trust outcome ($M=3.67, SD=2.07$). It is interesting that no

differences in recalled items were observed across the pre-outcome scenarios, since participants exposed to trust pre-outcome scenarios received fewer pieces of distrust-related information than those reading the distrust or the ambivalent pre-outcome scenarios. It is also noteworthy that in every pre-outcome scenario, despite receiving the uniform amounts of pre-outcome information regarding the target regardless of the outcome, there were significant differences in recollection, where participants recalled more distrust-related information if they saw a defection outcome.

As in Experiment 1, the proportions of outcome-supporting information that the participants remembered from their vignettes were compared against the proportions of outcome-supporting information that were presented. Again, comparison ratios were constructed by dividing the amount of outcome-supporting items recalled or presented by the total amount of outcome-supporting information and non-outcome-supporting information that was recalled or presented (see Tables 15 and 16). The comparison ratios were examined once more by using one-sample *t*-tests, to see if and how the participants' recollections of outcome-congruent information differed from the proportions of information that were presented to them (results on Table 17). Similar patterns were observed in the incongruent conditions, where participants recalled significantly higher proportion of outcome-supporting items than was presented to them in the vignettes. In both congruent conditions, participants recalled significantly lower proportions of outcome-supporting information than was presented. Finally, in one ambivalent condition with the trust outcome, participants recalled a significantly higher proportion of outcome-supporting items than was presented to them. It may not be surprising that these results resemble the incongruent condition with the distrust pre-outcome and the trust outcome, given the observations earlier regarding how the ambivalent conditions left the

participants biased toward distrust in much the same way as did the distrust-supporting pre-outcome conditions.

Table 15:

Experiment 2: Means for Outcome Supporting and Non-Outcome-Supporting Recalled Information with Comparison Ratios, as a Function of Pre-outcome and Outcome Scenarios.

Variables	Outcome-congruent items		Outcome-incongruent items		Total of congruent and incongruent items		Comparison Ratio: Recalled ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Pre-outcome: Distrust / Outcome: Trust ^a	3.90	1.58	3.77	1.59	7.68	2.94	0.52
Pre-outcome: Distrust / Outcome: Distrust ^b	2.23	1.28	6.82	3.23	9.05	4.32	0.75
Pre-outcome: Ambivalent / Outcome: Trust ^c	3.81	2.46	4.73	2.71	8.55	4.67	0.57
Pre-outcome: Ambivalent / Outcome: Distrust ^c	3.43	1.62	7.83	3.41	11.26	4.17	0.67
Pre-outcome: Trust / Outcome: Trust ^b	3.02	2.08	4.85	2.22	7.87	3.55	0.62
Pre-outcome: Trust / Outcome: Distrust ^a	2.97	1.50	7.32	3.21	10.29	4.15	0.70

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*, ^d Comparison ratio = Congruent Information recalled / Total of Congruent and Incongruent information recalled

Table 16:

Experiment 2: Means for Outcome Supporting and Non-Outcome-Supporting Information Presented in the Vignettes with Comparison Ratios, as a Function of Pre-outcome and Outcome Scenarios.

Variables	Outcome-congruent items	Outcome-incongruent items	Total of congruent and incongruent items	Comparison Ratio: Presented ^d
Pre-outcome: Distrust / Outcome: Trust ^a	8	45	53	0.15
Pre-outcome: Distrust / Outcome: Distrust ^b	45	8	53	0.85
Pre-outcome: Ambivalent / Outcome: Trust ^c	29	45	74	0.39
Pre-outcome: Ambivalent / Outcome: Distrust ^c	45	29	74	0.61
Pre-outcome: Trust / Outcome: Trust ^b	29	12	41	0.71
Pre-outcome: Trust / Outcome: Distrust ^a	12	29	41	0.29

^a = Incongruent, ^b = Congruent, ^c = Ambivalent, ^d Comparison ratio = Congruent Information / Total of Congruent and Incongruent information presented

Table 17:

Experiment 2: Means and T-tests for Free Recall Tasks and Comparisons

Variables	<i>N</i>	Comparison Ratio: Recalled	Comparison Ratio: Presented	<i>t</i> ^d	Cohen's <i>d</i> ^e
Pre-outcome: Distrust / Outcome: Trust ^a	30	0.52	0.15	12.60***	1.70
Pre-outcome: Distrust / Outcome: Distrust ^b	29	0.75	0.85	-5.60***	-1.18
Pre-outcome: Ambivalent / Outcome: Trust ^c	32	0.57	0.39	6.57***	1.28
Pre-outcome: Ambivalent / Outcome: Distrust ^c	29	0.67	0.61	1.81	0.47
Pre-outcome: Trust / Outcome: Trust ^b	29	0.62	0.71	-3.62**	-0.88
Pre-outcome: Trust / Outcome: Distrust ^a	30	0.70	0.29	19.88***	1.85

^a = *Incongruent*, ^b = *Congruent*, ^c = *Ambivalent*, ^d = one sample, ^e Cohen's *d* > 0 indicates higher proportion of recalled information than presented, ** = $p < .01$ (2 tailed), *** = $p < .001$ (2 tailed).

Trust inventories. An examination of both trust inventories indicated marginally acceptable reliability for the Interpersonal Trust Scale (Cronbach's $\alpha = .68$) and showed strong reliability the Revised Philosophy of Human Nature (RPHN) Inventory ($\alpha = .93$), as well as the RPHN subscales for both Trust ($\alpha = .92$) and Cynicism ($\alpha = .89$). These

measures (Table 18), for generalized interpersonal trust were strongly correlated with one another, as previously, $r(182) = .43, p < .001$.

Table 18:

Experiment 2: Means, Standard Deviations, Skew and Kurtosis for the Measures of Generalized Trust Expectancies.

Variable	Mean	SD	Skewness	Kurtosis
Interpersonal Trust Scale (ITS)	61.89	7.86	0.44	1.77
Revised Philosophy of Human Nature Inventory - TRUST subscale	6.70	15.70	0.86	0.03
Revised Philosophy of Human Nature Inventory - CYNICISM subscale	12.77	14.65	0.69	0.17
Revised Philosophy of Human Nature Inventory (PHN)	-6.07	13.35	0.48	0.69

Again, a factorial 3 (pre-outcome scenarios: trust/ambivalent/distrust) X 2 (outcome: trust/ distrust) ANOVA examining effects for the ITS and the RPHN was performed to check if responses were influenced by the experimental manipulation. This analysis revealed significant interactions for ITS scores (Tables 19 and 20), $F(2,177) = 5.72, p < .01, partial \eta^2 = .06$, where participants' scores on these trait measures varied depending on their conditions of the pre-outcome and outcome scenario. There

was also a main effect indicating the ITS scores were influenced by pre-outcome scenario, $F(1,177) = 3.21, p < .05, \text{partial } \eta^2 = .04$.

Table 19:

Experiment 2: Analysis of Variance Source Table for ITS Measures

Source	<i>df</i>	<i>F</i>	<i>partial</i> η^2
Pre-Outcome	2	3.21*	.04
Outcome	1	.01	.00
Pre-Outcome * Outcome	2	5.72**	.06
Error	177		

Note: * = $p < .05$, ** = $p < .01$

Table 20:

Experiment 2: Analysis of Variance Source Table for RPHN measures.

Source	<i>df</i>	<i>F</i>	<i>partial</i> η^2
Pre-Outcome	2	.71	.01
Outcome	1	.71	.00
Pre-Outcome * Outcome	2	4.48*	.05
Error	177		

Note: * $p < .05$

For the RPHN, significant interactions were observed, $F(2,177) = 4.48, p < .05$, $partial \eta^2 = .05$, also indicating influenced trust inventory scores based on combination of the pre-outcome and outcome scenarios. These results clearly indicate manipulation effects on the trust inventories. The ANCOVA tests that were used in Experiment 1 were not performed, as the results are non-interpretable due to the group differences brought about by the experimental manipulation.

Discussion

Experiment 2 exposed a second group of participants to another story about dyadic interpersonal trust, regarding a decision of a small business owner to hire a friend. As predicted, significant hindsight bias effects were observed in Experiment 2 in both incongruent conditions, where participants indicated feelings of surprise at the outcome, based on expectations set in the pre-outcome scenarios. A significant hindsight bias was observed in an ambivalent condition with the trust outcome, showing a very similar pattern to the vignette that had a distrust-pre-outcome and trust outcome. Manipulation checks for predictions and surprise ratings indicated the ambivalent conditions did not have balance in trust and distrust-supporting statements and, in fact, biased participants to distrust the target. The online pilot testing failed to indicate these sizable deviations from the desirable central tendencies. This dissimilarity may be a result of differences between the online pilot tests and the laboratory-administered procedure. The differences would include the difference between the 7-point Likert scale used in the online pilot test versus the (more sensitive) continuous 80-point continuous scale used in the laboratory measure. While the distrust-biased ambivalent conditions may present as a limitation to the experiment, the variables of interest did show the necessary patterns of elevated surprise in the incongruent conditions when compared to the congruent and, in kind, did show the

predicted patterns in hindsight bias. As the ambivalent conditions operationalized as a second set of distrust conditions, the results from these conditions followed the patterns predicted by sense-making theory. In effect, these errant ambivalent conditions further support the hypothesized predictions.

Once more, a significant reverse hindsight bias effect was observed in the congruent trust-favoring condition, with a second reverse hindsight bias pattern evident in the other incongruent condition favoring distrust, which failed to reach statistical significance. Here again, no theories directly explain what mechanism may be driving the reverse hindsight biases in these judgments where, in both conditions, participants reported very low levels of surprise. In fact, this seems contrary to expectation, based adjustment theories that anticipate such effects following surprising outcomes (Ofir & Mazursky, 1997). Although the trust dilemma in Experiment 2 differed in the content and the type of trust judgment from Experiment 1 (i.e., a small business hiring decision versus a minor interpersonal loan), the reverse hindsight pattern shows at least some consistency across these two different trust situations. Another unanswered question is why these unusual responses were activated in both incongruent conditions in this procedure and yet only the trust-favoring congruent condition in the previous experiment. An interesting line of research would be to pursue just what it is about judgments of trust that would invite a reversed hindsight bias trend after witnessing such situations as depicted in these experimental conditions.

For the exploratory measures, our third hypothesis was supported in that participants, in all the conditions where a hindsight bias was shown, indicated elevated proportions of recalled outcome congruent information, when compared with the proportions of information presented to them in the vignettes. This suggests increased

accessibility of such information consistent with a sense-making process. In addition to the anticipated incongruent conditions, elevated comparison ratios were observed for recall in the ambivalent condition where the target acted trustworthy, as well as in the congruent condition favoring distrust. As mentioned earlier, based on our manipulation check, the ambivalent condition where the target upheld trust likely activated sense-making in much the same way as did the incongruent condition with the same outcome and thus showing both a similar hindsight bias effect as well as the same pattern in the recall measures.

Exploratory analysis of the trust measures revealed significant differences in the generalized trust dispositions resulting from the manipulation. It appeared that the week's previous story, as well as the retrospection measure and recall test that immediately preceded the trust inventories, may have acted as a prime that inadvertently manipulated the participants' scores on the ITS and the RPHN. This is interesting because both of these inventories are well-used scales to make determinations about people's traits (rather than states) regarding generalized expectancies of interpersonal trust. It is possible that a two-session experiment may not be adequate to retrieve reliable data on this construct and, as such, this casts compelling questions and concerns regarding the fidelity of the data that were gathered in the previous experiment as well. Possibly a three-part experiment, where the inventory was administered before the primary prediction and retrospection measures and paired with distracter tasks may provide a better measure for this dimension.

CONCLUSIONS

These experiments investigated whether judgments of trust are susceptible to effects as were predicted by the sense-making model of hindsight bias. When exposed to third-person scenarios concerning interpersonal trust, hindsight effects were shown to be similar to other judgments under uncertainty and were largely consistent with the sense-making model of hindsight.

In Experiment 1, a single incongruent condition showed a hindsight bias effect when a target was depicted as trustworthy and subsequently defected. The distrust-supporting pre-outcome conditions failed to sufficiently bias participants' expectations toward perceptions of distrust regarding the target, so no effect was seen in the incongruent condition with a trust outcome. There are ample interpretations of the sense-making theories as well as hindsight bias theories that seem to offer explanations of how hindsight bias effects might be attenuated in the distrust pre-outcome conditions. The attributional explanation process that sense-making hinges upon is theorized to require sufficient motivation for the process to continue into a sustained cognitive process (Anderson, et al., 1996; DiFonzo & Bordia, 2007). Following the sense-making theory for hindsight bias, these motivated cognitions are presumably necessary to activate an increase of salience regarding the causal antecedents consistent with the outcome and, in turn, to bring about the hindsight bias effects. Additionally, the repayment of a small loan may have been perceived as such a trivial event that it might have been perceived as a "non-event", where hindsight biases have been shown to be small or null (Guilbault, et al., 2004; Wasserman, et al., 1991).

It was hoped that better-adjusted manipulations might show the desired deviations toward or away from trust of the target in subsequent designs. Accordingly, in

Experiment 2, a more balanced set of manipulations yielded the hypothesized interactions, as hindsight biases were observed in both incongruent conditions. The ambivalent conditions deviated from the midpoint in the direction of a bias toward distrust. As such, they shared the general response patterns that were more consistent with the distrust pre-outcome scenarios and can be said to further support our predictions from the sense-making model.

Some discussion is warranted regarding the intriguing reverse hindsight bias effect seen in both experiments, where participants' retrospective ratings of the target's trustworthiness dropped significantly when compared to the prediction ratings, in the congruent conditions with a trust pre-outcome and a trust outcome. Such reversed effects have been observed in hindsight bias research and are not without precedent. However the sense-making theory of hindsight bias failed to predict this pattern in these conditions and no other theories of hindsight bias appear to offer direct explanations for these cases. For instance, Ofir and Mazursky (1997) theorized that surprising responses on the part of participants might lead to a reversed hindsight bias effect. Given that the reports of surprise were lowest in this category, such expectation-based theories can also be considered an unsustainable explanation. Other research showed reversed hindsight bias effects for individuals who have received personally relevant and negative health information (Renner, 2003) or in subjects with low scores in need for cognition measures (Verplanken & Pieters, 1988).

One possible answer may lie in the nature of distrust-supporting information as compared to trust-supporting information. Negative and distrust-related cognitions, by their very nature, tend to be cognitively higher-activating, more salient and more memorable than positive and trust-related cognitions (Baumeister, et al., 2001; Schul,

Mayo, & Burnstein, 2008). The reverse hindsight bias effects seen here may be simply a degradation of the participants' representations of the target's trustworthiness over time, where the more hardy distrust-related representations were unaffected.⁴ Such an interpretation could be considered consistent with the foundational assumptions of the cognitive reconstruction theories that hindsight bias as a core memory phenomenon, is driven by changes of cognitive representations between the points of prediction and retrospection. Although the sense-making theories offer a powerful way to understand hindsight bias, one is well served to remember that recollection of predictions are vulnerable to any changes in representation which could happen due to a variety of causes. Such causes would certainly include exposure to sets of highly perishable pre-outcome information.

Exploratory measures produced a mixed, yet equally intriguing, set of results. A foundational assumption of the cognitive reconstruction frameworks is that an individual searches and retrieves sampling evidence available in long-term memory and that outcome-consistent information is more easily recalled and drives the "bias" in hindsight (Hawkins & Hastie, 1990). Sense-making theories propose that a motivated cognitive explanation process will increase the accessibility of information in certain conditions: specifically, in situations where the outcome information is not congruent with pre-outcome expectations. In the conditions where hindsight was observed, the free recall task produced the predicted patterns in the increased retention of outcome-consistent

⁴ This effect also serves as a powerful illustration in an experiment of how perishable a reputation of trustworthiness is, versus the hardy nature of a non-trustworthy reputation. This is certainly a well-documented theme in social psychology and trust literature (Kim, Ferrin, Cooper, & Dirks, 2004; Lewicki, et al., 1995; Schul, et al., 2008).

information in the participants' recollections of the stories in incongruent conditions, which is consistent with and further supports the sense-making theories.

Analysis of the trust measures indicated surprisingly little relationship to our variables of interest. However, issues with the design may have rendered these measures less meaningful. In the case of Experiment 2, it appears that our own manipulation may have impacted the results of the inventories, as the mean scores on this trait measure varied to a statistically significant degree, depending on the combination of conditions that the participants received. The fact that these results varied at all suggests *some* relationship between these types of trust decisions and the inventories. It certainly invites speculation and scientific questioning in hopes of learning more about this effect. Further research may be warranted to investigate the effects of individual differences on hindsight biases during trust judgments, perhaps using a different experimental design, more personally-focused vignettes, or simply using different inventories.

An important issue of the current research is the calibration of the instruments used to manipulate trust judgments and in turn measure hindsight bias. There are undeniable challenges pertaining to internal validity concerning interpersonal trust, especially with regard to confounds. It should be noted that theorists have long proposed that trust and distrust ought not be thought of as residing on a single continuum, but two parallel and opposing processes, which operationalize differently and have asymmetrical antecedents and consequences. In consideration of this "two-factor model" (Lewicki, et al., 1998), our measurement tool, which was a single bi-polar continuum capturing approach or avoidance cognitions relative to a target, may seem somewhat "messy" if not outright confounded. Therefore, it may not be surprising to see asymmetry among the manipulations and, as well, as the resulting hindsight bias effects.

In daily social interaction, humans are making often-important predictions of reliance as they deliberate matters of trust. Hindsight bias is a frequently occurring and possibly detrimental effect that occurs during and after a predictive judgment. If the hindsight bias effect indicates a failure for people to accurately recall their own predictions, then they are unlikely to learn from one's decisions (or mistakes), if they are unable to accurately access them in memory. In decisions of trust, when one incurs certain vulnerabilities based on such predictions, these lapses could prove to be of a recurring and perhaps highly problematic nature.

The goal of this experiment was to investigate if the previous evidence that supported the sense-making theories for hindsight bias could generalize into new domains and types of judgments, specifically those regarding interpersonal trust. Looking forward, we see strong opportunities in the pursuit of a fruitful line of research in both the laboratory as well as applied or quasi-experimental study.

Trust research in the laboratory can encounter important limitations in generalizability and external validity (Good, 1991) and clearly this project contended with some of those issues. In subsequent research, it would be desirable to move away from third person trust vignettes and model more personally-relevant judgments of trust, including first-person decision-making. Also, since people's life experience informs their decisions regarding who or what is trustworthy, expanding from the college-aged convenience sample to examine other age cohorts would also be advisable.

Future research could also examine the effects of hindsight bias following outcomes of other types of trust. These applications would include study of business outcomes, legal decisions, organizational trust, first-person trust decisions, shocking or personally relevant outcomes and repeated mistakes in judgments of trust. Such research

could go far to add to the scientific literature in providing a fuller understanding of trust and hindsight bias, as well as to help us adaptively learn from or mitigate the damage from the sometimes costly blunders of mistaken trust decisions.

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Appendix A

Third Person Trust Scenarios – Four Vignettes

VIGNETTE #1

Mark is a student at a medium-sized university, who works part-time as he attends school. Jim is a roommate of Mark's, who approached him one morning to borrow \$20. In his circle of friends, it is not uncommon to have loans like this and is something of a norm. Money has been pretty tight lately and Mark would definitely need the money back for his trip at the end of the month, so he had to weigh carefully whether or not to lend the \$20 to Jim.

All and all, Mark tends to like Jim a lot. There are times when Mark finds Jim annoying. Mark has known Jim for more than three years. He feels he knows him pretty well. As long as Mark has known Jim, Mark still considers him "a hard guy to figure out." Mark and Jim hang around in the same circle of friends. They are all pretty tight. Jim has struck Mark as moody - and seems a bit aloof at times. Jim has a job that pays reasonably well. There should be no problem paying the loan back. Jim sometimes seems to struggle with his finances and on occasion even paying some bills. Mark has known Jim to be mostly reliable, keeping his appointments and obligations to his friends. On occasion, Mark has known Jim to have lapses in integrity, which include lying to girlfriends and sometimes cheating on exams. Mark considers Jim a close friend. At times, Mark wishes Jim respected him more. On certain occasions, Mark has borrowed money from Jim in the past as well and Jim has been reliable in making loans when Mark asked. Jim has complained when Mark previously borrowed money. Jim has had to borrow money before from Mark and loans are not uncommon between the two roommates. Mark can't help but to think that he seems to loan money to Jim a little too often. Over the years, Jim has usually been very reliable in paying back Mark. And unfortunately, the last time Jim borrowed money from Mark, it took weeks and constant reminders to get the money back.

Mark has to decide whether or not to lend the \$20 to Jim, as Jim, on his way to an appointment, anxiously awaits his reply...

VIGNETTE #2

Melanie and Andrew are co-coworkers who happen to live on the same hall in a downtown apartment building. Melanie and Andrew work as associates at a powerful and very conservative corporate law firm. The partners in the company tend to be older and very traditionalist males. Melanie graduated near the top of her class and is a popular, driven, hard working professional who is considered to be on a partnership track. Melanie is considered a peer to Andrew and both have worked there for a number of years.

Melanie also happens to be gay and is in a serious long-term relationship with another woman. Mindful of the conservative climate, she has not disclosed this to anyone at work yet, as she doesn't want it to impact her chances of being a partner down the road. Early one morning while Andrew was heading to work Melanie was caught in a long embrace outside her apartment with her life-partner.

Later that morning Melanie and Andrew encountered each other again in a long line at the coffee stand. They had to wait while the attendant finished brewing a new pot. Andrew mentioned that he saw Melanie in the hallway and asked, "Who's your friend?" Melanie's heart started to race, as she quickly thought whether she should disclose her relationship to her co-worker or not...

All and all, Melanie tends to like Andrew very much. Sometimes Andrew says things that really rub Melanie the wrong way. Melanie is in fact probably as close with Andrew as anyone at the firm. Melanie often discovers things about Andrew that surprises and disappoints her in him. Melanie has confided in Andrew before and they frequently share small talk and idle gossip - usually nothing harmful or malicious. Melanie was once taken aback by some mean-spirited gossip shared by Andrew about another very unpopular associate. Melanie has even been invited to dinner at Andrew's house, repeatedly, to enjoy Sunday dinner with his family. Melanie has even gotten invitations for joining Andrew's family for Thanksgiving dinner. Melanie has declined dinner invitations to Andrew's house because she is a vegetarian. Andrew often makes fun of Melanie's vegetarianism, so Melanie wanted to avoid uncomfortable situations there. Confidentiality and discretion are a big part of a lawyer's job, so Melanie knows that Andrew should be able to keep a secret. Since both Melanie and Andrew are partnership tracked, anything that might compromise Melanie's reputation might increase Andrew's chances of advancement. Andrew has had a good reputation for integrity and forthrightness within the law firm. Melanie has known Andrew to have lapses in integrity - for instance, one time Melanie overheard Andrew lying to his spouse about going out after work. Melanie considers Andrew a good friend. Melanie sometimes wishes Andrew respected her more. Melanie admires that Andrew volunteers in soup kitchens and participates in community and church volunteer efforts during his time off. Melanie was taken aback when Andrew, was approached by a panhandler outside the office and replied, "Get a job!" Andrew, unasked, helped move a sofa into Melanie's apartment. Andrew, once declined to assist Melanie with a pro-bono case saying "What's in it for me?" Andrew, told Melanie that he enjoys doing criminal defense work because "everyone, no matter how poor or desperate, deserves good legal representation." Melanie was shocked at Andrew, when he described his criminal defendant clientele as being "Total scumbags -- every one of them."

Melanie's knew that she had to say something, but she wasn't sure if Andrew was safe to tell...

VIGNETTE #3

John owns and operates a miniature golf course in a seaside resort area. The summer is a busy time for the course and John needs help running the course since he

can't be there all the time. Chip lives next door to John's golf course and John knows Chip. He is eager to find a job and called John, to see if he could work at the course. John told Chip he had to think about it and to come up to the course and talk more about it later in the afternoon...

The miniature golf course is a "cash-based business" - so it would be really easy to steal from the moneybox. Therefore the person that John hires should be fairly trustworthy, or the business simply won't make ends meet.

John needs to find someone to hire for the course in the next day or so, in time for the weekend. Chip knows this and is waiting for the decision as John weighs the pros and cons of hiring Chip...

Chip is one of John's oldest friends - both had grown up and went to school together. Chip and John have grown apart in the last few years - Chip seems to really enjoy his single lifestyle as well as partying and carousing; while John is definitely more of a family guy and is more "settled down." Chip often calls John his oldest and very best friend, speaking well in appreciation of his relationship to John. Chip has not had "good luck" in maintaining relationships - either within their circle of friends, or in his romantic ones (he's divorced and a long line of ex-girlfriends). Chip assured John that he would be his very best employee. Chip has had a hard time staying in school, or keeping a job. Chip noted to John that he's never, ever let down John, as long as they've known each other - which is true. While it's true that Chip has never let down John, Chip has been known to let down others. Chip borrowed his brother's car last month and wrecked it in an uninsured accident. Chip couldn't pay for the repairs and his brother got stuck with the bill. John thinks Chip is a genuinely good guy and that Chip would do anything for his fellow man. John knows Chip is a guy who "has some problems" and has struggles with alcohol and cocaine use over the years, which has cost him some friends over time. John has never known Chip to "BS" or lie to him. They have always had a truthful and candid relationship. There's a lot of genuine respect between the two friends. John knows that Chip has been lying to and avoiding his ex-wife, who is looking for past-due alimony payments. John knows that the job at the golf course is not too complex - just stand behind the counter, hand out golf balls and putters and collect money - so Chip should be easily able to handle the job. John can't pay a lot for this position and he worries that Chip might be tempted with all that cash - plus, there is almost no way to monitor the cash drawer and protect from petty theft when John's not there. Chip is a genuinely friendly, very articulate and outgoing guy - so John knows that Chip should be able to handle customers well. Chip looks and dresses like a hippy - he seldom shaves and has long hair well past his shoulders and keeps a generally scruffy appearance - so John worries that family-based customers may find Chip's appearance a little off-putting. When given a choice between hiring a friend and hiring a stranger, John knows he'd rather hire a friend, like Chip, as you would get more loyalty out of a friend than someone you don't really know. John has seen Chip burn friends before - and, even though they continue to have a great friendship, wonders if Chip could someday let him down.

John sees Chip walking up the sidewalk to the golf course. John now has to decide what to tell him as to whether or not he'll hire Chip to help operate his cash business.

VIGNETTE #4

Megan is a female college sophomore who has recently begun her school year after spending the summer in her hometown. When Megan went home over the summer break and was at a party, she met a boy. They had a brief fling, that only lasted a few days right before both had to return to their respective schools. At school, Megan has a number of casual friends and acquaintances and has an active social life. Yet despite that, she can't think of anyone at school that she would describe as a "best friend." Megan doesn't always find it easy to "open up" and simply hasn't known anyone at school long enough or well enough to call her "best friend." Probably, Megan's closest friend at school is her roommate, Amber.

One Friday evening, two weeks into her semester Megan began to have reasons to suspect she may be pregnant. An at home pregnancy test was positive. Megan found this to be surprising and upsetting news. Later that night while out with friends, Amber noticed that Megan was unusually quiet, visibly upset, keeping to herself and not drinking alcohol. So Amber asked Megan "Is anything wrong?"

Megan started tearing up, quickly excused herself and headed to the bathroom. It was the weekend and no student counselors were available at her college. She wasn't ready to tell her parents yet, nor was she ready to discuss it with the boy. In fact, she hasn't told anyone yet and certainly doesn't want the world to know while she ponders her options. But she feels a need to talk about her predicament with somebody. Should she go back and tell Amber? For a moment, Megan pondered the pros and cons of whether Amber could be trusted with knowing about her secret...

Megan really likes Amber, probably more than anyone else at the college. Megan still thinks there is quite a lot that she doesn't know about Amber, since they have only known one another for about a year. Megan and Amber both have similar backgrounds and are pretty "simpatico", sharing similar interests and temperaments. Megan and Amber sometimes squabble about small things. Megan and Amber get along well together and tend to have long "girl-talk" conversations. Megan wonders if Amber might make her the subject of "girl-talk" with someone else -- and perhaps let her secret slip out. Megan thinks that Amber is basically dependable and can be counted on for small things or favors - like sharing a ride to school or borrowing money from. There are times when Megan wishes Amber was more reliable - like when Amber blows off doing her household chores or writing out her rent check on time. Megan feels that Amber is basically a good person. Amber often acts out of generosity and can be fairly considerate. There are times that Amber says or does things that rubs Megan the wrong way and finds really frustrating - and thinks that Amber can sometimes be a bit forceful and insensitive. Based on what little Megan knows about Amber, she seems to think that Amber has had a lot of life experiences and sometimes can give pretty good advice. Megan thinks that Amber can be pretty negative, strongly opinionated, judgmental and disapproving at times. Amber is known to be a good listener when it comes to people talking about their problems and appears to give people a lot of time when someone comes to her with a crisis. Megan remembers Amber once complaining about how people always come to her about their problems. Megan hears Amber frequently talk about "doing the right thing."

and knows Amber to be a spiritual and morally grounded person. Amber has very strong religious beliefs and while Megan doesn't have a problem with religion, she wonders if Amber's devout beliefs might affect her opinions about this issue, as well as affect Amber's opinions of Megan's moral character. Megan has never known Amber to be malicious or unkind toward her. Megan has seen Amber be unkind toward others: once when riding together, Megan saw Amber fly into a fit of road rage at an old person who was driving too slow, yelling, honking and cutting them off.

When Megan returned, to the group Amber quietly brought her aside and said, "Hey, obviously there's something very wrong -- Want to talk about it?"

Appendix B

Date Posted: _____

IRB/COSHSC #: _____

Project: Connections (*online*)

DESCRIPTION: The purpose of this study is to investigate how people comprehend situations and make judgments. You will be asked to read texts and answer questions or make judgments about the texts. This experiment is a one (1)-session study that should take no longer than one (1) hour.

CREDIT: Each session will take up to one (1) hour. You will receive one (1) credit for the one hour online session.

QUALIFICATIONS: Anyone who has not participated in a previous session of this study is eligible to participate.

LOCATION and TIME: This is an online survey, so student volunteers may participate at times of their own discretion and gain access through the SONA system. Volunteers should have access to a continuous (unbroken) Internet connection. Be advised that there might also be periods of system unavailability or maintenance that could prevent connecting to the SONA system or the survey.

PRINCIPLE INVESTIGATOR:

Ivan K. Ash, Ph.D.

Contact Information

iash@odu.edu

Office MGB 132 E

Phone 757-683-4446

Appendix C**University Human Subjects Committee / Institutional Review Board Exemption****COLLEGE OF SCIENCES**

Department of Biological Sciences - Norfolk, Virginia 23529-0266
Phone: (757)683-4595 Fax: (757)683-5283

19 Sept 2007

MEMO

TO: Dr Ash (PSYCH)

FROM: Christopher Osgood, Chair, College of Sciences Human Subjects Committee (CO)

RE: Your recent proposal, 007-08-003, "Connections"

Your recent submission to the COS Human Subjects Committee has been found to exempt from IRB review. You may begin your experimentation. Please note that this approval extends for one year from today's date. If you wish to modify or extend the protocol, please contact the College of Sciences regarding your request.

CHRISTOPHER
OSGOOD

Appendix D

OLD DOMINION UNIVERSITY Notification Document (*Online*)

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research.

PROJECT TITLE: "Project Connections Online"

DESCRIPTION: You are being asked to participate in a study on situation comprehension and judgment making. You will be asked to read information from the computer screen and answer questions about this information. This is a one session, hour-long study. The second session will meet in this same location at the same time one-week from today. You are being asked to participate in both sessions.

EXCLUSIONARY CRITERIA: You must not have participated in a previous session of this study.

RISKS: There are no known risks associated with this study besides those associated with normal everyday use of computers.

BENEFITS: There is no cost or payment associated with your participation in this investigation. The researchers want your decision about participation in this study to be absolutely voluntary. You will receive no direct benefit from this research.

If you decide to participate in this study, you will receive a total of 1 Psychology department research credit for one hour of participation, which may be applied to course requirements or extra credit in certain Psychology courses. Equivalent credits may be obtained in other ways. You do not have to participate in this research study, or any Psychology department study, in order to obtain this credit.

CONFIDENTIALITY: You will be assigned a participant code and this number (not your name) will be used to organize all data and records collected. Your name will not be kept with or associated with the data collected. The only records that contain identifying information (the consent form and the forms used to record your participation credit) will be separated from your other documents and the data collected. All records will be stored in a locked file cabinet in a locked room accessible only to authorized University staff and faculty. The results of this study may be used in reports, presentations and publications; but the researchers will not identify you. Of course, your records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE: It is OK for you to say NO. You may refuse to participate in or withdraw from this study at any time. If you do, there will be no penalty assigned to you whatsoever. PLEASE MAKE SURE YOU UNDERSTAND THIS

RIGHT. If you ever feel uncomfortable or have any questions about your participation, please do not hesitate to contact the experimenter, Dr Ivan Ash, by email (iash@odu.edu) or by phone at his office at (757) 683-4446. We have as our primary responsibility to ensure your health, safety and wellbeing and will do everything available to us to make sure your needs are given the most consideration. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

COMPENSATION FOR ILLNESS AND INJURY: If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of injury arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project please contact Old Dominion University Office of Research, at (757) 683-3460.

VOLUNTARY CONSENT: When you hit "NEXT" below and proceed to the following pages, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study and its risks and benefits. If you have any questions later on, then the researchers should be able to answer them:

Dr. Ivan K. Ash at iash@odu.edu or (757) 683-4446.

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call the Old Dominion University Office of Research, at 757-683-3460.

And importantly, when you hit the "NEXT" button and advance to the next page, you are indicating to the researcher YES, that you are a volunteer and agree to participate in this study. Upon request, the researcher can give you a copy of this form for your records, or you may print it out now.

Appendix E

Online Debrief Page

[< Back](#) [Finish](#) [Save](#)

Congratulations...

You finished the survey.

We appreciate your time and attention to this procedure.

The experiments you participate in can serve as educational opportunities, which allow you to learn a little about how psychologists study the nature of behavior, beliefs, emotions, and cognition. This procedure examines reactions and responses to four short stories that are designed to present a third-person dilemma regarding interpersonal trust. This material may be used in future research on this topic. Since these are original stories, it was necessary to see to what degree the scenarios (and all of their separate sentences and components) might address and measure the construct of "trust."

Since this is ongoing research, we would ask that you refrain from discussing specifics of this study with other classmates, or anyone that may be taking a psychology class this semester. This will help us prevent contamination or influencing of future subjects, and insure that this research -- as well as your time -- is all worthwhile.

Please hit "Finish" to close this part and proceed to the last step, the credit information and proof of completion page...

[< Back](#) [Finish](#) [Save](#)

Appendix F

Date Posted: _____

IRB/COSHSC #: 007-08-003**Project: Connections (*On Site*)**

DESCRIPTION: The purpose of this study is to investigate how people comprehend situations and make judgments. You will be asked to read texts and answer questions or make judgments about the texts. This experiment is a two (2)-session study with one of the two sessions occurring on different days exactly one week apart. Each session will take up to one (1) hour. You will be asked to sign up for both sessions at once.

CREDIT: Each session will take up to one (1) hour. You will receive one (1) credit for the first session and one (1) credits for the second session, for a total of two (2) credits.

QUALIFICATIONS: Anyone who has not participated in a previous session or version of this study is eligible to participate.

LOCATION and TIME: Refer to the sign-up sheet in the folder on the door of the Psychology Research Administrator's office (MGB 128) labeled CONNECTIONS for available times and locations. You must sign up for both sessions at the same time.

PRINCIPLE INVESTIGATOR:

Ivan K. Ash, Ph.D.

Contact Information

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Phone 757-683-4446

Appendix G

Pre-Outcome Scenarios

Story 1.)

Pre-Outcome Vignette: Money Loan

Code	Vignette sentence	Factor
S1	Mark is a student at a medium-sized university, who works part-time as he attends school.	Situation
S2	Jim is a roommate of Mark's, who approached him one morning to borrow \$20.	Situation
S3	In their circle of friends, it is not uncommon to have loans like this and is something of a norm.	Situation
S4	Money has been pretty tight lately and Mark would definitely need the money back for his trip at the end of the month, so he had to weigh carefully whether or not to lend the \$20 to Jim.	Situation (risk)
T1	All and all, Mark tends to like Jim a lot.	Likability
N1	There are times when Mark finds Jim annoying.	Likability
T2	Mark and Jim hang around in the same circle of friends and they are all a pretty tight group.	History
N2	Jim has struck Mark as moody and seems a bit aloof at times.	History
T3	Jim has a job that pays reasonably well, so there should be no problem paying the loan back.	Ability To Uphold Trust; Dependability
N3	Jim sometimes seems to struggle with his finances and on occasion even paying some bills.	Ability To Uphold Trust; Dependability
T4	On certain occasions, Mark has borrowed money from Jim in the past as well and Jim has been reliable in making loans when Mark asked.	History; Predictability
N4	Jim has complained when Mark previously borrowed money.	History; Predictability
T5	Mark has known Jim to be mostly reliable, keeping his appointments and obligations to his friends.	Integrity; Dependability
N5	On occasion, Mark has known Jim to have lapses in integrity, which include lying to girlfriends and sometimes cheating on exams.	Integrity; Dependability
T6	Mark considers Jim a close friend.	Likability; History; Faith

N6	At times, Mark wishes Jim respected him more.	Likability; History; Faith
T7	Mark has known Jim for more than three years, so he feels he knows Jim pretty well.	History; Faith
N7	As long as Mark has known Jim, Mark still considers him “a hard guy to figure out.”	History; Faith
T8	Jim has had to borrow money before from Mark and loans are not uncommon between the two roommates.	History; Dependability
N8	Mark can’t help but to think that he seems to loan money to Jim a little too often.	History; Dependability
T9	Over the years, Jim has usually been very reliable in paying back Mark.	Ability To Uphold Trust; Dependability
N9	And unfortunately, the last time Jim borrowed money from Mark, it took weeks and constant reminders to get the money back.	Ability To Uphold Trust; Dependability
S5	Mark has to decide whether or not to lend the \$20 to Jim, as Jim, on his way to an appointment, anxiously awaits his reply.	Situation / Judgment point

Appendix H

Outcome Scenarios

1a.)

Outcome Vignette: Money Loan / Trust is warranted

Code	Vignette sentence	Factor
S1	Mark knew he had the money to lend Jim but quickly reviewed the reasons whether or not to loan the \$20 to Jim.	Situation
S2	Jim gently but anxiously reminded Mark that he had to go and needed to know if he had the money to lend him.	Situation
T1	Mark after a moment said, "okay" and gave Jim a \$20 bill. Jim smiled and thanked him...	Trust is extended (trustworthy)
S3	As Mark returned to what he was doing, Jim turned and left the room in a hurry to his appointment.	Situation
S4	For the next several days, life went on much as it did before. Relations stayed cordial between the two roommates.	Situation
T2W	One morning, Jim walked in quietly as Mark was eating breakfast and slapped a \$20 bill on the table. After a second he said "Thanks for the loan last week," and went on to make small talk and discuss plans for the next weekend.	Aftermath - Trust is warranted

1b.)

Outcome Vignette: Money Loan / Trust defection

Code	Vignette sentence	Factor
S1	Mark knew he had the money to lend Jim but quickly reviewed the reasons whether or not to loan the \$20 to Jim.	Situation
S2	Jim gently but anxiously reminded Mark that he had to go and needed to know if he had the money to lend him.	Situation
T1	Mark after a moment said, "okay" and gave Jim a \$20 bill. Jim smiled and thanked him...	Trust is extended (trustworthy)
S3	As Mark returned to what he was doing, Jim turned and left the room in a hurry to his appointment.	Situation
S4	For the next several days, life went on much as it did before. Relations stayed cordial between the two roommates, but after a while, Mark started to wonder when he would see his money.	Situation
T2D	As time progressed, Mark began to resent Jim for being slow in paying him back. They started to have small disagreements about a variety of things and the relationship distinctly chilled. During one heated disagreement Mark brought up the issue of the loan. Jim coolly replied "What loan?" He smirked and walked away.	Aftermath - Trust defection

Appendix I

OLD DOMINION UNIVERSITY Notification Document (Onsite)

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research and to record the consent of those who say YES.

PROJECT TITLE: “Project Connections”

DESCRIPTION: You are being asked to participate in a study on situation comprehension and judgment making. You will be asked to read information from paper booklets or computer screens and answer questions about this information. This is a two-session study. The second session will meet in this same location at the same time one-week from today. You are being asked to participate in both sessions

EXCLUSIONARY CRITERIA: You must not have participated in a previous session of this study.

RISKS: There are no known risks associated with this study besides those associated with normal everyday classroom use of computers and booklets.

BENEFITS: There is no cost or payment associated with your participation in this investigation. The researchers want your decision about participation in this study to be absolutely voluntary. You will receive no direct benefit from this research.

If you decide to participate in this study, you will receive a total of 2 Psychology department research credits (one for the first session and two for second session), which may be applied to course requirements or extra credit in certain Psychology courses. Equivalent credits may be obtained in other ways. You do not have to participate in this research study, or any Psychology department study, in order to obtain this credit.

CONFIDENTIALITY: You will be assigned a participant code and this number (not your name) will be used to organize all data and records collected. Your name will not be kept with or associated with the data collected. The only records that contain identifying information (the consent form and the forms used to record your participation credit) will be separated from your other documents and the data collected. All records will be stored in a locked file cabinet in a locked room accessible only to authorized University staff and faculty. The results of this study may be used in reports, presentations and publications; but the researchers will not identify you. Of course, your records may be subpoenaed by court order or inspected by government bodies with oversight authority.

WITHDRAWAL PRIVILEGE: It is OK for you to say NO. You may refuse to participate in or withdraw from this study at any time. If you do, there will be no penalty assigned to you whatsoever. PLEASE MAKE SURE YOU UNDERSTAND THIS RIGHT. If you ever feel uncomfortable or have any questions about your participation, please do not hesitate to inform the experimenter. We have as our primary responsibility to ensure your health, safety and wellbeing and will do everything available to us to make sure your needs are given the most consideration. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

COMPENSATION FOR ILLNESS AND INJURY: If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of injury arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project please contact Old Dominion University Office of Research, at 757-683-3460.

VOLUNTARY CONSENT: By signing this form, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied that you understand this form, the research study and its risks and benefits. The researchers should have answered any questions you may have had about the research. If you have any questions later on, then the researchers should be able to answer them:

Dr. Ivan K. Ash at iash@odu.edu or (757) 683-4446.

If at any time you feel pressured to participate, or if you have any questions about your rights or this form, then you should call the Old Dominion University Office of Research, at 757-683-3460.

And importantly, by signing below, you are telling the researcher YES, that you agree to participate in this study. Upon request, the researcher can give you a copy of this form for your records.

Date

Signature of Participant

Appendix J

GENERAL OPINION SURVEY (Rotter's Interpersonal Trust Scale)

INSTRUCTIONS: This is a questionnaire to determine the attitudes and beliefs of different people on a variety of statements. Please answer the statements by giving as true a picture of your own beliefs as possible. Be sure to answer each item carefully and show your beliefs by selecting the appropriate choice.

(Likert Scale Responses)

Scoring:

(1) Strongly Agree (1); Mildly Agree (2); Agree and Disagree equally (3); Mildly disagree (4); Strongly Disagree (5)

Reverse scoring:

Strongly Agree (5); Mildly Agree (4); Agree and Disagree equally (3); Mildly disagree (2); Strongly Disagree (1)

1.	Most people would rather live in a climate that is mild all year round than in one in which the winters are cold.	<i>(REVERSE SCORING)</i>
2.	Hypocrisy is on the increase in our society.	<i>(REVERSE SCORING)</i>
3.	In dealing with strangers, one is better off to be cautious until they have provided evidence that they are trustworthy.	<i>(REVERSE SCORING)</i>
4.	This country has a dark future unless we can attract better people into politics.	<i>(REVERSE SCORING)</i>
5.	Fear of social disgrace or punishment rather than conscience prevents most people from breaking the law.	<i>(REVERSE SCORING)</i>
6.	Parents can usually be relied upon to keep their promises.	<i>(STANDARD SCORING)</i>
7.	The advice of elders is often poor because the older person doesn't recognize how times have changed.	<i>(INSTRUCTOR - DO NOT SCORE)</i>

8.	Using the Honor System of NOT having a teacher present during exams would probably result in increased cheating.	
9.	The United Nations will never be an effective force in keeping world peace.	
10.	Parents and teachers are likely to say what they believe themselves and not just what they think is good for the child to hear.	
11.	Most people can be counted on to do what they say they will do.	
12.	As evidenced by recent books and movies, morality seems on the downgrade in this country.	
13.	The judiciary is a place where we can get unbiased treatment.	
14.	It is safe to believe that in spite of what people say, most people are primarily interested in their own welfare.	
15.	The future seems very promising.	
16.	Most people would be horrified if they knew how much news the public sees and hears is distorted.	
17.	Seeking advice from several people is more likely to confuse than it is to help.	
18.	Most elected public officials are really sincere in their campaign promises.	
19.	There is no simple way of deciding who is telling the truth.	
20.	This country has progressed to the point where we can reduce the amount of competitiveness encouraged by schools and parents.	
21.	Even though we have reports in newspapers, radio and television, it is hard to get objective accounts of public events.	
22.	It is more important that people achieve happiness than greatness.	
23.	Most experts can be relied upon to tell the truth about the limits of their knowledge.	
24.	Most parents can be relied upon to carry out their threats of punishment.	

25.	One should not attack the political beliefs of others.	
26.	In these competitive times, one has to be alert or someone is likely to take advantage of you.	
27.	Children need to be given more guidance by teachers and parents than they now typically get.	
28.	Most rumors usually have a strong element of truth.	
29.	Many major national sport contests are fixed in one way or another.	
30.	A good leader who molds the opinions of the group is leading rather than merely following the wishes of the majority.	
31.	Most idealists are sincere and usually practice what they preach.	
32.	Most salesmen are honest in describing their products.	
33.	Education in this country is not really preparing young men and women to deal with the problems of the future.	
34.	Most students would not cheat even if they were sure of getting away with it.	
35.	The hordes of students now going to college are going to find it more difficult to find good jobs when they graduate than did the college graduates of the past.	
36.	Most repair men will not overcharge even if they think you are ignorant of their specialty.	
37.	A large share of accident claims filed against insurance companies are phony.	
38.	One should not attack the religious beliefs of other people.	
39.	Most people answer public opinion polls honestly.	
40.	If we really knew what was going on in international politics, the public would have more reason to be frightened than they now seem to.	

Appendix K

Revised Philosophies of Human Nature Scale (RPHN)

This questionnaire is a series of attitude statements. Each represents a commonly held opinion and there is no right or wrong answers. You will probably disagree with some items and agree with others. We are interested in the extent to which you agree or disagree with matters of opinion.

Read each statement carefully. Then indicate the extent to which you agree or disagree with the statement by selecting a response for each statement.

Revised Philosophies of Human Nature Scale	Trust or Cynicism
1. If most people could get into a movie without paying and be sure that they would not be seen, they would do it.	C
2. Most people have the courage of their convictions.	T
3. The average person is conceited.	C
4. Most people try to apply the Golden Rule, even in today's complex society.	T
5. Most people would stop and help a person whose car was disabled.	T
6. The typical student will cheat on a test when everybody else does, even though he has a set of ethical standards.	C
7. Most people do not hesitate to go out of their way to help someone who is in trouble.	T
8. Most people would tell a lie if they could gain by it.	C
9. It's pathetic to see an unselfish person in today's world because so many people would take advantage of him.	C
10. "Do unto others as you would have them do unto you" is a motto that most people follow.	T
11. People claim that they have ethical standards regarding honesty and morality, but few people stick to them when the chips are down.	C
12. Most people will speak out for what they believe in.	T
13. People pretend to care more about one another than they really do.	C
14. People usually tell the truth, even when they know they would be better off lying.	T
15. Most people inwardly dislike putting themselves out to help other people.	C
16. Most people would cheat on their income tax if they had the chance.	C
17. The average person will stick to his opinion if he thinks he's	T

	right, even if others disagree.	
18.	Most people will act as “Good Samaritans” if given the opportunity	T
19.	Most people are not really honest for a desirable reason; they’re afraid of getting caught.	C
20.	The typical person is sincerely concerned about the problems of others.	T

5 point Likert scale:

Agree strongly	+3
Agree somewhat	+2
Agree slightly	+1
Disagree slightly	-1
Disagree somewhat	-2
Disagree strongly	-3

Appendix L

Story 2. Pre-Outcome and Outcome Vignettes: Hiring a friend

Code	Vignette sentence	Factor
S1	John owns and operates a miniature golf course in a seaside resort area.	Situation
S2	The summer is a busy time for the course and John needs help running the course since he can't be there all the time.	Situation
S3	Chip lives next door to John's golf course and John knows Chip. He is eager to find a job and called John, to see if he could work at the course.	Situation
S4	John told Chip he had to think about it and to come up to the course and talk more about it later in the afternoon...	Situation
S5	The miniature golf course is a "cash-based business" – so it would be really easy to steal from the moneybox. Therefore, the person that John hires should be fairly trustworthy, or the business simply won't make ends meet.	Situation (risk)
S6	John needs to find someone to hire for the course in the next day or so, in time for the weekend. Chip knows this and is waiting for the decision as John weighs the pros and cons of hiring Chip...	Situation
T1	Chip is one of John's oldest friends. – both grew up and went to school together.	History
N1	Chip and John have grown apart in the last few years –Chip seems to really enjoy his single lifestyle as well as partying and carousing; while John is definitely more of a family guy and is more "settled down."	History
T2	Chip often calls John his oldest and very best friend, speaking well in appreciation of his relationship to John.	History; Likability
N2	Chip has not had "good luck" in maintaining relationships — either within their circle of friends, or in his romantic ones (he's divorced and a long line of ex-girlfriends).	History; Likability
T3	Chip assured John that he would be his very best employee.	Ability to uphold trust
N3	Chip has had a hard time staying in school, or keeping a job.	Ability to uphold trust
T4	Chip noted to John that he's never, ever let down John, as long as they've known each other – which is true.	Ability to uphold trust
N4	While it's true that Chip has never let down John, Chip has been known to let down others: like when Chip borrowed his brother's car and totaled it in an uninsured accident.	Ability to uphold trust
T5	John thinks Chip is a genuinely good guy and that Chip would do anything for his fellow man.	History; Ability to uphold trust

N5	John knows Chip is a guy who “has some problems” and has struggled with alcohol and cocaine use over the years, which has cost him some friends over time.	History; Ability to uphold trust
T6	John has never known Chip to “BS” or lie to him. They have always had a truthful and candid relationship. There’s a lot of genuine respect between the two friends.	Integrity
N6	John knows that Chip has been lying to and avoiding his ex-wife, who is looking for past-due alimony payments.	Integrity
T7	John knows that the job at the golf course is not too complex – just stand behind the counter, hand out golf balls and putters and collect money – so Chip should be easily able to handle the job.	Ability to uphold trust
N7	John can’t pay a lot for this position and he worries that Chip might be tempted with all that cash – plus, there is almost no way to monitor the cash drawer and protect from petty theft when John’s not there.	Ability to uphold trust
T8	Chip is a genuinely friendly, very articulate and outgoing guy – so John knows that Chip should be able to handle customers well.	Ability to uphold trust
N8	Chip looks and dresses like a hippy — he seldom shaves and has long hair well past his shoulders and keeps a generally scruffy appearance — so John worries that family-based customers may find Chip’s appearance a little off-putting.	Ability to uphold trust
T9	When given a choice between hiring a friend or hiring a stranger, John knows he’d rather hire a friend, like Chip, as you would get more loyalty out of a friend than someone you don’t really know.	Ability to uphold trust; Integrity
N9	John has seen Chip burn friends before – and, even though they continue to have a great friendship, wonders if Chip could someday let him down.	Ability to uphold trust; Integrity
S7	John sees Chip walking up the sidewalk to the golf course. John now has to decide what to tell him as to whether or not he’ll hire Chip to help operate his cash business.	Situation / Judgment point

2a.)

Outcome Vignette: Hiring a friend / Target is trustworthy

Code	Vignette sentence	Factor
S1	Chip approached John warmly and shook his hand. Chip asked if John. Had “thought about his proposition.”	Situation
S2	When Chip asked that, John said yes he’d been thinking a lot about it... John paused for a moment and then made up his mind.	Situation
T1	John smiled and said “Okay - you can start this weekend if you want.”	Trust is extended (trustworthy)
S3	Chip thanked John for the opportunity. The two worked out the details and Chip filled out a few legal forms.	Situation
S4	Chip, as he walked away said to John that he appreciated the chance and that “I won’t let you down.”	Situation
T2W	Chip started work that weekend and showed up on time for work every day.	Aftermath - Trust is warranted
T3W	Chip stayed late as necessary, was reliable and was one of the hardest workers that John had ever employed at the course.	Aftermath - Trust is warranted
T4W	At the end of the season, Chip got an end of season bonus in appreciation for his hard work and reliability throughout the season.	Aftermath - Trust is warranted
T5W	Chip continued to work at the course for several more summers.	Aftermath - Trust is warranted

2b.)

Outcome Vignette: Hiring a friend / Trust defection

Code	Vignette sentence	Factor
S1	Chip approached John warmly and shook his hand. Chip asked if John. Had “thought about his proposition.”	Situation
S2	When Chip asked that, John said yes he’d been thinking a lot about it... John paused for a moment and then made up his mind.	Situation
T1	John smiled and said “Okay - you can start this weekend if you want.”	Trust is extended (trustworthy)
S3	Chip thanked John for the opportunity. The two worked out the details and Chip filled out a few legal forms.	Situation
S4	Chip, as he walked away said to John that he appreciated the chance and that “I won’t let you down.”	Situation
T2D	Chip started work that weekend and initially things went well. Then Chip became less reliable, coming in late and sometimes not showing up at all.	Aftermath - Trust defection
T3D	After a few weeks money began to be noticeably and unaccountably missing at the end of the shift. John became suspicious of Chip.	Aftermath - Trust defection
T4D	After the cash shortages went on for about a week, John placed a hidden video camera behind the counter and caught Chip pocketing \$20 bills.	Aftermath - Trust defection
T5D	Chip was confronted with the evidence and fired on the spot. John chose not to press charges -- but the friendship was definitely over.	Aftermath - Trust defection

VITA

CURRICULUM VITAE

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Social Cognition, Decision Making, Judgments of Trust and Distrust, The Hindsight Bias effect, Social Stigma, Implicit Cognitions, Biasing and Influence Factors resulting from Exposure to Media Imagery.

RESEARCH PAPERS PRESENTED AT PROFESSIONAL MEETINGS

Smith-Rodden, M. & Ash, I. K. (2009, May). Examining the hindsight bias effect during judgments of trust. Paper presented at the Annual Meeting, Virginia Academy of Science, and Virginia Commonwealth University: Richmond, VA.

Smith-Rodden, M., Ash, I. K., Phillips, A. (2009, May). Trust Judgments and the Hindsight Bias Effect. Poster presented at the 21st Annual Convention of the Association for Psychological Science / "Crossing Boundaries: Becoming a Cumulative Science": San Francisco, CA.