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Hindsight Bias in Clinical Decision Making

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Abstract

The tendency for an individual to believe that a specific event, in hindsight, was more predictable than it was in foresight is known as hindsight bias. This phenomenon has been demonstrated in the psychological literature across a variety of samples, methodologies, and predictions for decades. The current study used a sample of 95 mental health professionals to explore the impact of advanced outcome knowledge on the decision making process. Participants reviewed a hypothetical risk assessment in the form of a hospital chart and then responded to a series of questions, using only their clinical judgment. Analyses revealed that evaluators who were provided with outcome information regarding risk assessment evaluations were significantly more likely to indicate that they would have predicted the outcome than evaluators who were not provided with outcome information. Additionally, evaluators with advanced outcome knowledge endorsed higher ratings for risk of violence than those individuals who were not provided with outcome information on the evaluatee's risk assessment. Implications for forensic evaluation and legal decision making are discussed and directions for future research presented.

Keywords: hindsight bias, cognitive bias, forensic, decision making, risk assessment

Hindsight Bias in Clinical Decision Making

Forensic mental health professionals are frequently called upon to provide comprehensive and objective psychological evaluations with regard to a specific legal matter. These evaluators are considered by the court to be experts on the basis of their education, training, and experience and, because their judgment may impact the outcome of criminal and civil cases, they are professionally obligated to provide informed opinions to the best of their ability (Otto, 1989). In forensic evaluation, clinical judgment is a necessary component in developing opinions regarding the previous, current, and/or future behavior and cognitive functioning of an individual. The American Psychological Association (APA, 2013) set forth the Specialty Guidelines for Forensic Psychology (SGFP) to guide the activities of forensic practitioners to the benefit of the recipients of their services. SGFP guideline 1.02 states, “When conducting forensic examinations forensic practitioners strive to be unbiased and impartial, and avoid partisan presentation of unrepresentative, incomplete, or inaccurate evidence that might mislead finders of fact” (APA, 2013, p. 8). Thus, as the SGFP highlight, it is critical that evaluators remain vigilant of their potential for biases in order to prevent adverse effects on a forensic evaluation.

Even with these guidelines in place, however, forensic evaluations may still be tainted by a variety of factors that have the potential to limit the accuracy and validity of the evaluator’s judgment. Some of these influencing factors include the presence of a third party during the evaluation, (e.g., an attorney or a family member; Cramer & Brodsky, 2007), cultural differences between the evaluator and individual being evaluated (Weiss & Rosenfeld, 2012), or issues pertaining to improper test administration

(Heilbrun, 1992). While it is important that evaluators give these factors appropriate consideration when conducting their evaluations, the most common human factors that arise are those related to the evaluator's own subjective experiences and biases (Neal & Grisso, 2014). Over the past three decades, substantial maturation has occurred within the discipline of forensic psychology with respect to the (potential) impact of human factors in forensic decision making; however, extensive hurdles remain. In 2010, Heilbrun and Brooks called for research on bias and human error to strengthen the field of forensic mental health assessment and to enhance the accuracy and objectivity required in forensic decision making.

The existence and impact of various cognitive biases have been investigated in the medical (Arkes, 1981), legal (Stallard & Worthington, 1998), and social psychology (Pronin, Lin, & Ross, 2002) domains for decades. Similar to forensic psychology, these fields utilize various sources of information to critically analyze situations and to generate informed decisions (Neal & Brodsky, 2016). It is, therefore, not surprising that research has demonstrated that cognitive biases can also affect forensic mental health assessments (e.g., Boccaccini, Turner, & Murrie, 2008; Murrie, Boccaccini, Guarnera, & Rufino, 2013).

Most typically, legal decision making takes place *after* some event has occurred. With respect to the issue of negligence, professionals are often tasked with evaluating the foreseeability of a particular event; an evaluation that unequivocally take place ex post facto. Additionally, evaluators may be asked to assess the likelihood of an event that has already happened—such as suicide or a violent act—or asked to assess the appropriateness of professional practice considering these subsequent outcomes (Borum,

Otto, & Golding, 1993; LeBourgeois, Pinals, Williams, & Appelbaum, 2007). If the forensic evaluator opines that the appropriate level of care was not met in the initial evaluation, the initial evaluator may be subject to disciplinary actions or civil liability (LeBourgeois et al., 2007). These retrospective evaluations sustain considerable weight; therefore, it is critical that they are performed using methods to mitigate any potential bias. This is especially important in light of the well-known cognitive bias known as hindsight bias. Research has been demonstrated that people perceive and evaluate events differently, in hindsight, as a result of the tendency to overestimate what they could have known in foresight (Arkes & Harkness, 1980; Baron & Hersey, 1988; Fischhoff, 1975; Fischhoff, 1977; Fischhoff & Beyth 1975; Gilbertson, Dietrich, Olson, & Guenther, 1994; LaBine & LaBine, 1996). In addition, when provided with information regarding the outcome of an event, individuals may simplify, trivialize, and retrospectively criticize the judgments that others have made without acknowledging the difficulty involved in the decision making process (LeBourgeois et al., 2007).

Hindsight Bias

Fischhoff (1975) created what is now known as the model paradigm for examining hindsight bias. By utilizing a hindsight group (individuals provided with knowledge regarding a specific outcome) and a foresight group (individuals not provided with knowledge regarding that same outcome) he assessed whether the receipt of advanced outcome information impacts an individual's judgment. In addition, he examined the level of awareness that individuals have regarding the impact that the outcome knowledge had on their perception regarding a past event. Fischhoff opined that decision makers are unaware of the impact of outcome knowledge on the perceived

predictability of an event. Further, he demonstrated that information detailing the outcome of an event becomes assimilated into an evaluator's decision making process, inevitably impacting the objectivity of the decision (Fischhoff, 1975).

In some instances, evaluators with a great deal of experience on a certain topic might assume other individuals approach similar questions and situations with the same ease that they do, forgetting that they are especially proficient in the subject matter (Marks & Arkes, 2010). When an evaluator does not actively separate the proficiency of his or her knowledge in a particular area, he or she demonstrates source confusion, which is the inability to discriminate the different sources of information when evaluating a past event (e.g., what information came from the evaluation and what information came from knowledge he or she had known prior to reviewing the evaluation; Marks & Arkes, 2010). It is imperative that experienced evaluators be aware of this and acknowledge their expertise as well as the fact that others may not be as experienced. In addition, evaluators with more experience may also be more familiar with the base rate for an event's occurrence; thus, if the occurrence of a specific event is rare, those with more experience may be less likely to make judgments suggestive of hindsight bias when compared to novice evaluators (Dawson et al., 1988). Research regarding the impact that an individual's experience in a given subject area has on the potential for hindsight bias, however, is mixed. Some studies indicate that expertise in a subject area can mitigate the impact of hindsight bias where other studies suggest that expertise does not make a difference (for review see; Christensen-Szalanski & Willham, 1991; Guilbault, Bryant, Brockway, & Prosavac, 2004).

Additional research on hindsight bias has suggested that evaluators take outcome

knowledge and provide more weight to information from the event that supports that outcome, rather than independently formulating their own opinion surrounding the event (Arkes, Wortmann, Saville, & Harkness, 1981). In this scenario, evaluators essentially disregard other relevant information that may have led to alternate opinions. This suggests that the decision-making process may not have been as thorough as it could have been had all the information been scrutinized equally and other outcomes considered.

Hindsight bias is well-established in the psychological literature. Since Fischhoff's seminal research, meta-analyses have shown a significant effect across various predictions, subjects, and methodologies (Christensen-Szalanski & Willham, 1991; Guilbault et al., 2004). Hindsight bias is robust, difficult to reduce, and has appealed to researchers with a wide range of interests (Pezzo, 2011) such as medical professionals (Arkes & Harkness, 1980), psychiatrists (LeBourgeois et al., 2007), historians (Dymkowski, Domin, Marszałek, & Pałasiński, 2007), accountants (Jennings, Lowe, & Reckers, 1998) and, more recently, judges (Oeberst & Goeckenjan, 2016). In addition, a number of studies have examined this form of bias within the legal context, including felony murder (Evelo & Green, 2013), warrantless police searches (Casper, Benedict, & Perry, 1989), and civil liability decisions (LaBine & LaBine, 1996).

When evaluating a past event, individuals tend to overestimate their ability to predict the outcome of that event (Arkes, Faust, Guilmette, & Hart, 1988). The inability to separate hindsight and foresight knowledge when providing an expert opinion may become an issue among forensic mental health evaluators. LeBourgeois et al., (2007) examined hindsight bias utilizing a sample of 235 general and forensic psychiatrists. Findings reflected that those who were provided with outcome information regarding an

evaluator's risk assessment endorsed significantly higher risk ratings than those who were not provided outcome information. However, when examining the impact this information had on negligence determination, the difference between groups was non-significant. Further, LeBourgeois and colleagues (2007) explored the responses of general psychiatrists in comparison to forensic psychiatrists. Results suggested that forensic psychiatrists were less prone to this form of bias, as the mean difference in risk ratings between those provided additional outcome information and those who were not was smaller in the forensic psychiatrist sample as compared to the general psychiatrist sample. These researchers postulated that this might be due to the nature of forensic work, as it is frequently scrutinized by courtroom personnel (i.e., judges, jurors, attorneys) and that forensically oriented psychiatrists may use standardized assessments for evaluating risk, essentially mitigating this form of bias.

Current Study

The current study sought to examine the postulations by LeBourgeois et al., (2007), which suggested that forensic mental health professionals may be less susceptible to hindsight bias when conducting retrospective evaluations, due to involvement in ongoing education and research as well as the ethical practice of forensics. A sample of forensic mental health professionals was used to further explore whether advanced outcome knowledge impacts the decision making process causing hindsight bias-like effects in retrospective risk assessments. As forensic mental health evaluations are supposed to be bias-free, further examination of the issue of hindsight bias utilizing a diverse sample of forensic mental health professionals will allow for further delineation of the potential impact of outcome knowledge on these evaluations. Based on the

growing empirical literature, it was hypothesized that those professionals who were provided with information regarding the outcome of the risk assessment would endorse higher risk assessment ratings—and be more likely to report that they would have predicted the outcome—in comparison to those professionals who were unaware of the outcome. Further, as LeBourgeois et al., (2007) found that psychiatrists' determinations of negligence were not impacted by outcome information, regardless of if they were general or forensic practitioners, it was hypothesized that in the current study receipt of advanced outcome information would not impact the professional's determination of negligence.

Methods

Participants

Data were collected between June 2015 and November 2016 from forensic mental health evaluators attending one of three different in-person training workshops in areas relevant to forensic evaluation. Participants were 95 forensic mental health professionals (34 males (36%); 61 females (64%)) who ranged in age from 21 to 75 years ($M = 41.37$, $SD = 14.13$). Most participants (47%) reported some form of doctoral degree as their highest level of education (PhD: 30%, $n = 28$; PsyD: 17%, $n = 16$) and an average of 13 years ($SD = 11.26$) in their current profession. Participants' experience conducting forensic evaluation ranged from 0-37 years ($M = 8.58$, $SD = 9.82$).

Materials

Demographics. Participants completed a demographic questionnaire that encompassed a breadth of questions relevant to various Forensic Mental Health Assessments (Appendix A). Questions assessed evaluators' attitudes and experiences

regarding a range of topics, but only information relevant to this study was included in the analyses.

Risk assessment case material. Participants were provided with information consisting of a brief overview of an individual's risk assessment (either risk for homicide or risk for suicide) in the form of a hospital chart. The stimulus materials used in the current study were the same materials used by LeBourgeois and colleagues in 2007. LeBourgeois et al. (2007) indicated that their materials were kept concise (i.e., under 750 words) to encourage participants' completion and noted that the hypothetical cases had been circulated to 11 psychiatrists for feedback to ensure the cases were representative of an actual risk assessment evaluation.

All information within the actual case (i.e., history of present illness, mental health, medical, psychosocial and family history, mental status exam, additional information, final assessment, and plan) was identical for both the hindsight and foresight groups, with the exception that the hindsight groups received one sentence of additional information regarding the outcome of the evaluatee's risk assessment (e.g., Two days after the psychologist in the emergency room assessed him, the patient committed suicide by shooting himself with a gun; see Appendix B).

Risk assessment questionnaire. The questionnaire was modeled off the Lebourgeois et al., (2007) and Labine and Labine (2006) studies, which both examined hindsight bias effects in risk assessment evaluations and negligence determinations. Questions were designed to garner the clinician's assessment of the evaluatee's risk for violence (i.e., homicide or suicide) at the time he was released from the hospital using a 7 point Likert-type scale (1 = low risk, 4 = moderate risk, 7 = high risk), as well as a closed

ended question asking, “*What would you have predicted the outcome of this incident was likely to be?*” (e.g., patient would commit suicide or patient would not commit suicide). Participants were also provided the opportunity to indicate three to four reasons for their prediction.

Subsequent questions were designed to assess participants’ opinions regarding the initial evaluator’s risk assessment. Participants were asked the degree to which they believed the initial assessment was negligent on a 7 point Likert scale (1 = not negligent, 4 = moderately negligent, 7 = very negligent). A closed-ended question also asked, “*If you had to make a final decision about the negligence of this psychologist, what would you decide?*” (i.e., this psychologist was not negligent in performing his/her professional duty or this psychologist was negligent in performing his/her professional duty; see Appendix C).

Procedure

This study was part of a larger project exploring issues relevant to forensic evaluations such as bias awareness, inter-rater reliability of forensic assessment tools, and cultural differences. Data were collected at a series of training workshops attended by forensic mental health professionals between June 2015 and November 2016. A 2 (homicide risk v. suicide risk) x 2 (hindsight-received outcome information v. foresight-no outcome information) between-groups design was used. Each participant received a research packet containing the stimulus materials, demographic questionnaire, and two copies of the informed consent form. Stimulus materials were randomized to ensure that each participant received one of the four conditions: (a) suicide foresight group, (b) suicide hindsight group, (c) homicide foresight group, and (d) homicide hindsight group.

Participants were told about the research and were asked to complete the informed consent, retaining a copy for their own records, and the research materials. Participation was voluntary and all participants were assured that the decision whether to participate or not would in no way impact the training they would receive at the workshops. All materials and procedures were approved by the Institutional Review Board at the City University of New York.

Data Analysis

Between-group comparisons on demographic variables were conducted using analysis of variance (ANOVA) and Tukey's post-hoc test for continuous variables and chi-square analyses for categorical variables. Questions concerning risk assessment were subject to a series of ANOVAs, chi-squares, and logistic regressions to analyze whether responses differed between hindsight and foresight groups. Questions concerning negligence were subject to a series of ANOVA and chi-square analyses.

Results

Demographic Variables

No significant main effects were found between the three sub-samples when comparing demographic variables based on data collection period (see Table 1). Thus, the groups were collapsed and analyzed as a single sample. No significant main effects were found between hindsight and foresight groups or between suicide and homicide groups for any of the demographic variables (see Table 2). As research surrounding expertise and hindsight bias has mixed results Tukey's post-hoc analyses was conducted to see if years' experience conducting forensic evaluations differed as this would allow for further analyses exploring this relation and adding to the literature. Tukey's post-hoc analyses, however, indicated that the suicide foresight group ($M = 12.57$ years, $SD = 11.42$)

reported conducting forensic evaluations significantly longer than the suicide hindsight group ($M = 4.37$ years, 4.71 ; $F(3, 74) = 2.486$, $p = .043$, 95% CI [.171, 16.242]).

Risk Ratings

Participant responses were analyzed to identify whether ratings of risk differed by type of risk assessment. Comparisons between suicide and homicide conditions revealed no significant main effects, $F(1,87) = .999$, $p = .320$, $\eta_p^2 = .011$, 95% CI [-.264, .797], or interaction effects, $F(1,87) = 1.47$, $p = .229$, $\eta_p^2 = .017$, 95% CI [-1.707, .414]. Thus, the suicide and homicide groups were collapsed for the remainder of the risk rating analyses.

Opinions regarding Risk

Participants were asked to provide risk ratings that were both continuous (on a 7-point Likert-type scale) and categorical (would/would not commit suicide/homicide). Comparisons between hindsight and foresight groups with respect to continuous opinions regarding risk showed a significant main effect for outcome knowledge, $F(1,87) = 11.343$, $p = .001$, $\eta_p^2 = .115$, $M_{diff} = -.898$, 95% CI [-1.429, -.368] such that participants who were provided with outcome information gave significantly higher violence risk ratings ($M = 4.78$, $SD = 1.15$) than those who were not provided with outcome information ($M = 3.85$, $SD = 1.38$; see Figure 1). Participants' risk ratings on the Likert-type scale significantly predicted their categorical responses regarding risk, $b = 1.501$, $Wald = 17.417$, $p < .001$, $OR = 4.48$, 95% CI [2.22, 9.07]), such that for every 1.5 point increase on the scale participants were 4.48 times more likely to endorse a categorical response suggesting they would have predicted the violent act based on the information provided. In comparison to their foresight counterparts, participants who were provided with outcome information were significantly more likely to report that they would have

predicted a violent outcome at the initial evaluation, $\chi^2(1) = 7.453, p = .006$; $\Phi = .286$ 95% CI [.94, 469].

Experience and Risk Ratings

As a significant difference was found between the suicide hindsight and foresight groups with respect to years of experience conducting forensic evaluations, exploratory analyses were run to investigate whether experience predicted participants' decisions regarding risk. Years of experience was not a significant predictor of risk ratings, $r^2 = .009, F(1, 72) = .654, p = .421, 95\% \text{ CI } [4.079, 4.975]$, regardless of whether or not participants received outcome information.

Negligence Ratings

Participant responses were analyzed to determine whether opinions regarding negligence significantly differed by type of risk assessment. Comparisons between suicide and homicide conditions revealed no significant main effects, $F(1,85) = .216, p = .643, \eta_p^2 = .003, 95\% \text{ CI } [-.803, .498]$ or interaction effects, $F(1,85) = 1.13, p = .291, \eta_p^2 = .013, 95\% \text{ CI } [-1.996, .605]$. Thus, the suicide and homicide groups were collapsed for the remainder of the negligence opinion analyses.

Opinions regarding Negligence

No significant differences were found between hindsight and foresight groups with respect to opinions regarding negligence, measured either continuously, $F(1,85) = .216, p = .643, \eta_p^2 = .003, 95\% \text{ CI } [-.803, .498]$, or categorically, $\chi^2(1) = 1.44, p = .229$; $\Phi = .103, 95\% \text{ CI } [.008, .315]$ (see Figure 2). Participants' responses were split equally between determinations of negligence, with half the participants indicating they believed the initial evaluator was negligent. The highest frequency of "negligent" opinions (i.e.,

that the initial evaluator was negligent) was found amongst those participants who had received outcome information.

Discussion

The aim of this study was to extend the current body of literature on forensic mental health assessment by examining the impact of outcome information on forensic evaluators' ex post facto opinions/predictions regarding risk. Results demonstrate the presence of hindsight bias when evaluators are provided with outcome information and asked to formulate opinions regarding a previously-conducted risk assessment. That is, evaluators who were provided with information regarding event outcomes (i.e., were informed that the evaluatee went on to commit a violent act) provided significantly higher violence risk ratings and were more likely to suggest that they would have predicted a violent outcome than those who were not provided with outcome information. These findings support the primary hypothesis that evaluators who are provided with information regarding the outcome of an event will provide opinions indicative of hindsight bias, potentially resulting in a lack of objectivity in the evaluation process.

The results of this study are consistent with previous research on hindsight bias, which has demonstrated that when individuals are provided with outcome information regarding a specific event, their judgment of that event is impacted as they believe the outcome of the event was highly foreseeable (Arkes et al., 1988; Arkes et al., 1981; Baron & Hershey, 1988; Fischhoff 1975; Hawkins & Hastie, 1990; Labine & Labine, 1996; Lebourgeois et al., 2007). The results of the current study highlight the biasing effect that advanced outcome knowledge has on forensic mental health evaluators' expert opinions regarding ex post facto predictions of risk. Participants did not appear to

appreciate the difficulty of the initial decision making process, as their responses indicated that they would have known the outcome of the evaluation based on the initial assessment. Thus, their evaluation of and decision making process regarding the initial event, in hindsight, do not meet the objective standard to which forensic examinations aspire.

It is essential to the overall neutrality and objectivity of the assessment process that evaluator decisions are as objective and accurate as possible. Currently, although several guidelines are in place, there is no judicial determination that establishes minimally acceptable standards of professional conduct for forensic evaluations (Heilburn, DeMatteo, Marczyk, & Goldstein, 2008) and, depending upon the jurisdiction, the credentials required for being considered an expert evaluator may be lax (Frost, de Camara, & Earl, 2006). The field of forensic psychology has evolved to where it is considered a best practice to acknowledge the limitations in forensic evaluation: Being aware of issues of bias and taking steps to mitigate the impact of bias are important first steps.

If forensic evaluators overestimate their ability to predict outcomes and underestimate the difficulty of the decision making process, they may misestimate the causal role of the actions, or omissions, of a previous evaluator (LeBourgeois et al., 2007). It is reassuring, to some extent, that responses regarding the initial evaluator's potential negligence were not impacted when participants in our study were provided with outcome information. These results mirror Lebourgeois et al's. (2007) results and help to delineate the types of decisions (assessments and evaluations) for which the inclusion of additional outcome information might have an impact.

Although ratings of negligence did not differ between the hindsight and foresight groups, the findings from this study have vast implications for the field of forensic psychology. Risk ratings in this study showed marked differences between the two groups, demonstrating, again, that advanced outcome knowledge has the ability to hinder the objectivity of the evaluation process and lead to biased opinions/testimony by mental health evaluators (Labine & Labine, 1996). Objective assessments—wherein evaluators are required to maintain an impartial stance and provide evaluations that are free from bias—are necessary to ensure that criminal justice proceedings are fair and the rights of defendants are protected. Forensic evaluators are considered experts by the courts and, as such, are required to provide impartial opinions to assist the trier of fact in making a legal decision. It is presumed that forensic mental health evaluators will only consider information germane to the legal issue being evaluated; however, when outcome information is provided and assimilated into an evaluator's decision making process, without measures in place to limit the impact of irrelevant contextual, this is no longer the case and the opinion of the evaluator becomes, potentially, less dependable. For example, an evaluator who formulated an opinion of risk that was based only on relevant case information provides a more reliable opinion for the court, as that evaluator's decision was not tainted by knowledge of the outcome that was unknown to the initial evaluator.

A related issue for retrospective evaluations wherein the evaluator is aware of the outcome is that the evaluator comes to believe that he or she would have known the outcome all along; in essence, demonstrating that evaluators are unable to tease apart the impact of various pieces of data (information) on their decision making process. Just as it 'is impossible to unring a bell', evaluators are unable to discount the impact of irrelevant

information on their decisions/opinions. The result of this is an exaggerated level of confidence in one's decision making ability (Arkes, 1981; Arkes et al., 1981; Koriat, Lichtenstein, & Fischhoff, 1980). Evaluators may believe that they are better decision makers than they actually are and overestimate their ability to predict outcomes of similar events in the future, all without realizing the impact of the additional (irrelevant) information on their decision making process (Fischhoff & Beyth, 1975). This overconfidence in decision making can lead to premature conclusions and a lack of sufficient consideration of alternative possibilities, ultimately decreasing the accuracy of future judgments. This undue level of confidence might result in a lack of further development of one's decision making skills (e.g., "I'm good at what I do, I don't need any further training or professional development").

Research has suggested that the more a person knows about a topic, the less likely it is that learning the outcome will lead to considerable change in the decision making process (Christensen-Szalanski & Willham, 1991). In the current study years experience was not a predictor of participants' response regarding risk for violence regardless if the participant is given outcome information or not suggesting otherwise. These results add to the mounting evidence suggesting that hindsight bias can compromise legal decision maker's ability to make fair and unbiased decisions (Casper et al., 1989; Evelo & Green, 2013; Labine & Labine, 2006; LeBourgeois et al., 2007)

Qualitative Responses

Exploration of participants' qualitative responses indicated interesting differences between participants who predicted violence and those who did not. Those participants who predicted a non-violent outcome selected *protective* factors that supported this

opinion (e.g., low base rate, evaluatee's son, medication compliant); however, those who predicted a violent outcome referenced *risk* factors in support of this opinion (e.g., specific victim, poor self-care, social withdrawal and feelings of hopelessness). Although participants were all given the same case information, qualitative responses regarding reasons for their opinions indicated that participants selected pieces of data in support of their decision. That is, participants highlighted protective factors in support of opinions of low risk (non-violent outcomes) whereas risk factors were highlighted for opinions of high risk (violent outcomes). Contextual information regarding the outcome of the event might have served as an anchor, causing participants to search for data consistent with this outcome.

In formulating an opinion, forensic evaluators must consider a series of data points (observations), which form the basis for their conclusion. Participants' qualitative responses were further examined to see whether two evaluators given the exact same information (the same observations; i.e., the same case information), with the exception that one of them received an additional piece of data (irrelevant contextual information regarding outcome), would give equal weight to the same data. Some participants who *were* given outcome information selected a particular piece of data (information) as a reason for why they believed they *would have* predicted the violent act whereas participants who *were not* given outcome information used that same piece of data as a reason for why they *would not* have predicted the violent act. For example, one participant who was provided with the outcome of the homicide evaluation indicated that he (or she) would have predicted the act of homicide because the evaluatee had "numerous thoughts of killing, including past thoughts." However, another participant who was not

informed of the outcome indicated that she (or he) would not have predicted the violent act because the evaluatee had “no history of violence even when he thought about hurting someone prior.” In addition, one participant provided with the outcome of the suicide evaluation indicated he (or she) would have predicted a suicide outcome because the evaluatee “had a desire for hospitalization” whereas a participant who did not receive outcome information opined that she (or he) would not have predicted the outcome because “the patient came to the ER for help.” These examples illustrate how the same information can be used as the basis for two opposing opinions, and how contextual information can impact the interpretation of the various data points (observations) that forensic evaluators must consider when formulating their opinions. These examples demonstrate how two forensic evaluators given the same information can arrive at different conclusions and how poor reliability between evaluators can impact ex post facto predictions of risk. In the current study participants relied solely upon their clinical judgment to make decisions; however, even with actuarial measures—which are thought to be objective and to reduce or eliminate discretion or subjectivity in scoring the items—research has shown that expert reliability is poor and subject to bias (Murrie et al., 2013). It would be beneficial for the field to create standardize procedures that may help in mitigating the impact of additional contextual information on the way information is processed in forensic evaluation. This study, as well as others, demonstrates the impact of irrelevant information (i.e., outcome information, retaining party) in leading to different (i.e., unreliable) conclusions between individuals.

Limitations

Caution with the generalizability of these results is warranted as participants were

not randomly selected. Rather, these professionals sought out training in areas related to forensic psychology. Evaluators who seek out training opportunities may be characteristically different from those who do not, thus it is possible that the evaluators in this study were more motivated to obtain training and perhaps were more knowledgeable about, and/or less susceptible to, biases in their own work. Further, these professionals might have obtained previous training on clinical decision making or techniques to mitigate the impact of bias, further enabling them to minimize bias in the responses they provided. Even though participants in this study displayed a wide range of forensic experience, geographic location, and varying educational degrees, replicating this study with a random sample of forensic mental health participants might lead to more generalizable findings as a result of stronger external validity.

Another limitation is that participants were provided a limited amount of information on the evaluatee and the risk assessment. The case material used was not nearly as rich and comprehensive as it would have been in practice. In addition, there was no mention in any of the case material about whether the initial evaluator inquired about the evaluatee's access to weapons. Because most of the participants in this study found the evaluator negligent, regardless of receiving outcome information or not, it is plausible that the lack of information regarding weapons might have impacted the results regarding negligence. It could be the case that participants in this study who were informed of the outcome yet stated that they would not have predicted the outcome from the initial evaluation, still opined that the initial evaluator was negligent due to this lack of information. Determinations surrounding negligence may have been different if information regarding access to a weapon had been provided.

Future Research

These results have implications for retrospective evaluations of an individual's risk. Future research should examine hindsight bias in other types of evaluations and assessments (e.g., diagnostic evaluations, competency to stand trial evaluations, custody evaluations). Understanding the nuances regarding the types of evaluations and the circumstances under which this type of bias can occur will assist in creating and implementing standardized assessment procedures to minimize or mitigate the impact of biasing information in forensic evaluation.

Counterfactual reasoning, or "considering-the-opposite," has been demonstrated as a technique to minimize the effects of hindsight bias in decision making (Koriat et al., 1980; Lord, Lepper, & Preston, 1984; Slovic, & Fischhoff, 1977). Being aware of the impact that this bias has on the decision making process, as well as being instructed to ignore the known outcome when evaluating a situation that has already occurred, has been shown to be a "useless technique" to diminish the impact of this form of bias (Fischhoff, 1975). By considering the opposite the evaluator is encouraged to think through all possible outcomes and to review all reasons why an event might have occurred. It is hoped that by thinking through all possible outcomes an evaluator may convey a level of confidence in their decision that would appropriately reflect the thorough process they utilized to make that decision. As it has been demonstrated that outcome information impacts forensic mental health professionals' retrospective assessments of risk, future research should examine the impact of considering the opposite or other bias-mitigation techniques on decision making regarding retrospective risk assessments.

Linear sequential unmasking is a context management technique that has been highlighted in the forensic sciences as a means of reducing the impact of irrelevant information on the decision making process (Dror et al., 2015). Linear sequential unmasking delineates limits and restrictions on when various pieces of data are provided to evaluators with the goal of providing only that information which is relevant to the referral question. In the current study, evaluators were informed of the outcome prior to reading the case materials and prior to being given an opportunity to formulate their own conclusions. Providing forensic evaluators with case materials without biasing outcome information and only providing outcome information (or other irrelevant contextual information) after an evaluator has made an initial formulation of risk might assist forensic evaluators in attaining impartial and objective evaluations—standards to which their evaluations are held.

Conclusion

This study demonstrated that advanced outcome knowledge has the ability to affect an evaluator's objectivity in the decision making process. When evaluators were informed of the outcome of an individual's risk assessment, they believed the outcome to have been foreseeable and provided responses suggesting that they would have predicted the outcome during the initial evaluation. Additionally, evaluators selected details from the case report that corroborated their opinions, suggesting that they did not take into consideration the level of difficulty required to make the initial evaluation decision.

Context can impact the way we process information. Biases are implicit and can impact an evaluation without the evaluator's awareness. By understanding and recognizing biases, evaluators can achieve a better quality of work. Without

acknowledging biases, it is plausible that evaluators will not take further steps to mitigate it. When hindsight bias impacts the evaluation process, the validity of the evaluator's opinion may ultimately be called into question. The lack of objectivity in the decision making process can negatively impact the creditability of the opinion provided, the evaluator, and the field of forensic psychology. Results from the current study emphasize the need for forensic evaluators to remain vigilant of how hindsight bias can negatively impact evaluations, as well as how the field of forensic psychology must work towards implementing de-biasing techniques.

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Appendix A: Demographic Survey

Please answer the following questions regarding your background and experience conducting **forensic evaluations**. You will be asked to provide numbers or percentages below that you may not necessarily have absolute values for; please do your best to estimate where applicable.

Age: _____

Gender: Male _____ Female _____

Country of Residence: _____
If United States, which state?: _____

Please indicate your profession:

_____ Psychology
_____ Psychiatry
_____ Social Work
_____ Other (please specify) _____

Highest degree(s) and year(s) received: _____

Indicate the specialty track of your highest degree:

Clinical _____ Neuropsychology _____ Industrial/Organizational _____
Counseling _____ Geriatric _____ Health/Rehabilitation _____
Forensic _____ Other (please specify) _____

Which of the following describes your training in **forensic psychology**? (*indicate all that apply*)

_____ Formal postdoctoral fellowship in forensic psychology or psychiatry
_____ Medical degree in psychiatry followed by continuing education in forensic evaluation
_____ Doctoral degree in psychology (i.e., clinical, counseling) followed by continuing education in forensic evaluation
_____ Doctoral degree in *forensic* psychology
_____ Master's degree in *forensic* psychology
_____ Master's degree in psychology (i.e., clinical, counseling) followed by continuing education in forensic evaluation
_____ Other (please specify) _____

Are you licensed to practice psychology? Yes _____ No _____

Year of first licensure in psychology: _____

Number of years post-doctoral practicing: _____

State(s) or Country in which you practice: _____

Which professional organizations related to your work are you a member, affiliate, fellow, etc. for?

Please indicate the number of years of experience in your current profession: _____

Please indicate the number of years of experience in forensic evaluation: _____

Please indicate the number of years of experience working with forensic populations: _____

Approximately how many forensic evaluations have you performed over the course of your career? _____

Approximately how many forensic evaluations did you perform in 2015? _____

Which best describes your experience performing forensic evaluations of *any* kind (e.g., trial competence/fitness, legal sanity/criminal responsibility, violence risk, child custody)?

_____ I have not had any training in forensic evaluation, and I have never conducted an evaluation independently

_____ I have training in forensic evaluation, but have never conducted an evaluation independently

_____ I have conducted 1-5 forensic evaluations independently

_____ I have conducted 6-20 forensic evaluations independently

_____ I have conducted 21-100 forensic evaluations independently

_____ I have conducted more than 100 forensic evaluations independently

Approximately how many times per year do you testify in court about your evaluations? _____

Appendix B: Case Studies

Homicide Risk Assessment Practice Survey

--- Case Background ---

A patient presented to a hospital emergency room with a chief complaint of homicidal ideation. He was released with directions to follow-up with his outpatient psychiatrist.

Below is a reproduction of the hospital chart with the note that the evaluating psychologist wrote after assessing the patient. Please review the case and answer the questions that follow the case.

BEGINNING OF HOSPITAL ER CONTACT SUMMARY

--- Chief Complaint ---

“I’m feeling worse.” “I’m having homicidal thoughts of killing my ex-wife and friend.”

--- History of Present Illness ---

Mr. Davis is a 34-year-old Caucasian man who arrived alone at the ER at 10:30PM. He reported feeling depressed for the last three months but “started getting worse” in the last week. He has been having thoughts about “shoot and kill his ex-wife and friend.” He reported that recently she has taken their young child and left him. He reported he was convinced she left him for his friend and that she had been “sleeping around” prior to their divorce. He has felt slowed down, has had difficulty concentrating, and has lost ten pounds over the last three months. He took a few days off of work last week because he “can’t get out of bed in the morning.”

He first saw a psychiatrist ten days ago, and he was prescribed Zoloft 50mg. Mr. Davis says he has been taking the medicine regularly. He said he has been feeling more anxious and having more difficulty sleeping than before taking Zoloft and “thought about stopping it.” He said he attempted to contact his psychiatrist, but since it is the weekend, he has been unable to contact her at her office number.

--- Mental Health History ---

He reported thinking about homicide on one prior occasion at the age of 25 after a breakup with a girlfriend, but he did not make an attempt. Has never sought treatment for depression until ten days ago. He drinks “two glasses of wine at dinner once a week.” He denied illicit drug use.

--- Medical History ---

No major medical conditions.

--- Psychosocial History ---

Employed as a salesman. Divorced 6 months ago. Has a 3-year-old son who lives with his ex-wife in a neighboring state. Not currently in a relationship. Has family in the city and is close with one brother who lives in the city. Has few friends from work with whom he usually socializes, but not lately.

--- Family History ---

Father is an “alcoholic”
 Sister takes Paxil for “stress”
 No family history of suicides or psychiatric hospitalizations

--- History of Violence ---

Mr. Davis has no known history of violence.

--- Mental Status Exam ---

Appearance- looks like he hasn't shaved in several days
 Behavior- mild psychomotor agitation (fidget, can't sit still)
 Mood- “depressed,” “nervous”
 Affect- congruent with self-report
 Speech- slow rate
 Thought process- linear
 Thought content- (+) homicidal ideation, and thoughts of “killing my ex-wife and friend.”
 He said, “I would never do it because I want her to be here for my son”
 No suicidal ideation
 No delusions were endorsed
 Perceptions- no auditory or visual hallucinations
 Cognition- no objective impairment
 Insight- good (he knows he is depressed and seeks treatment)

--- Additional Information ---

I was able to contact Mr. Davis' current psychiatrist. She said that Mr. Davis was scheduled for another appointment in three weeks; but that she has an opening in her schedule and he could come to her office in one week for an earlier appointment if needed. She indicated she would write and call in a prescription for Clonazepam 0.5mg po bid, 30 pills, no refill for symptoms potentially resulting from Zoloft side effects.

--- Assessment ---

1. Major Depression, recurrent, moderate severity
2. Adjustment issues (divorce)
3. Increased anxiety/insomnia since starting Zoloft is likely an early side-effect of Zoloft, per treating MD
4. Although Mr. Davis was initially interested in hospitalization, when I explained that his anxiety was likely a side-effect of Zoloft that could improve with time and a brief course of an additional medication, he endorsed feeling hopeful and said he would rather go home.

--- Plan ---

1. Pt indicated he would continue to take anti-depressant medication as prescribed, and he would immediately pick up and start taking Clonazepam as prescribed/recommended by treating MD
2. Follow-up with regular psychiatrist in one week
3. Return to the ER if/as needed.

Homicide Risk Assessment Practice Survey**--- Case Background ---**

A patient presented to a hospital emergency room with a chief complaint of homicidal ideation. He was released with directions to follow-up with his outpatient psychiatrist.

--- Case Outcome ---

Two days after the psychologist in the emergency room assessed him, the patient shot his ex-wife and friend.

Below is a reproduction of the hospital chart with the note that the evaluating psychologist wrote after assessing the patient. Please review the case and answer the questions that follow the case.

BEGINNING OF HOSPITAL ER CONTACT SUMMARY**--- Chief Complaint ---**

“I’m feeling worse.” “I’m having homicidal thoughts of killing my ex-wife and friend.”

--- History of Present Illness ---

Mr. Davis is a 34-year-old Caucasian man who arrived alone at the ER at 10:30PM. He reported feeling depressed for the last three months but “started getting worse” in the last week. He has been having thoughts about “shoot and kill his ex-wife and friend.” He reported that recently she has taken their young child and left him. He reported he was convinced she left him for his friend and that she had been “sleeping around” prior to their divorce. He has felt slowed down, has had difficulty concentrating, and has lost ten pounds over the last three months. He took a few days off of work last week because he “can’t get out of bed in the morning.”

He first saw a psychiatrist ten days ago, and he was prescribed Zoloft 50mg. Mr. Davis says he has been taking the medicine regularly. He said he has been feeling more anxious and having more difficulty sleeping than before taking Zoloft and “thought about stopping it.” He said he attempted to contact his psychiatrist, but since it is the weekend, he has been unable to contact her at her office number.

--- Mental Health History ---

He reported thinking about homicide on one prior occasion at the age of 25 after a breakup with a girlfriend, but he did not make an attempt. Has never sought treatment for depression until ten days ago. He drinks “two glasses of wine at dinner once a week.” He denied illicit drug use.

--- Medical History ---

No major medical conditions.

--- Psychosocial History ---

Employed as a salesman. Divorced 6 months ago. Has a 3-year-old son who lives with his ex-wife in a neighboring state. Not currently in a relationship. Has family in the city and is close with one brother who lives in the city. Has few friends from work with whom he usually socializes, but not lately.

--- Family History ---

Father is an “alcoholic”
 Sister takes Paxil for “stress”
 No family history of suicides or psychiatric hospitalizations

--- History of Violence ---

Mr. Davis has no known history of violence.

--- Mental Status Exam ---

Appearance- looks like he hasn't shaved in several days
 Behavior- mild psychomotor agitation (fidget, can't sit still)
 Mood- “depressed,” “nervous”
 Affect- congruent with self-report
 Speech- slow rate
 Thought process- linear
 Thought content- (+) homicidal ideation, and thoughts of “killing my ex-wife and friend.” He said, “I would never do it because I want her to be here for my son”
 No suicidal ideation
 No delusions were endorsed
 Perceptions- no auditory or visual hallucinations
 Cognition- no objective impairment
 Insight- good (he knows he is depressed and seeks treatment)

--- Additional Information ---

I was able to contact Mr. Davis' current psychiatrist. She said that Mr. Davis was scheduled for another appointment in three weeks; but that she has an opening in her schedule and he could come to her office in one week for an earlier appointment if needed. She indicated she would write and call in a prescription for Clonazepam 0.5mg po bid, 30 pills, no refill for symptoms potentially resulting from Zoloft side effects.

--- Assessment ---

1. Major Depression, recurrent, moderate severity
2. Adjustment issues (divorce)
3. Increased anxiety/insomnia since starting Zoloft is likely an early side-effect of Zoloft, per treating MD
4. Although Mr. Davis was initially interested in hospitalization, when I explained that his anxiety was likely a side-effect of Zoloft that could improve with time and a brief course of an additional medication, he endorsed feeling hopeful and said he would rather go home.

--- Plan ---

1. Pt indicated he would continue to take anti-depressant medication as prescribed, and he would immediately pick up and start taking Clonazepam as prescribed/recommended by treating MD
2. Follow-up with regular psychiatrist in one week
3. Return to the ER if/as needed.

END OF HOSPITAL CHART

Suicide Risk Assessment Practice Survey

--- Case Background ---

A patient presented to a hospital emergency room with a chief complaint of suicidal ideation. He was released with directions to follow-up with his outpatient psychiatrist.

Below is a reproduction of the hospital chart with the note that the evaluating psychologist wrote after assessing the patient. Please review the case and answer the questions that follow the case.

BEGINNING OF HOSPITAL ER CONTACT SUMMARY

--- Chief Complaint ---

“I’m feeling worse.” “I’m having suicidal thoughts.”

--- History of Present Illness ---

Mr. Davis is a 34-year-old Caucasian man who arrived alone at the ER at 10:30PM. He reported feeling depressed for the last three months but “started getting worse” in the last week. He has been having thoughts about “shooting himself in the head to end it all.” He has felt slowed down, has had difficulty concentrating, and has lost ten pounds over the last three months. He took a few days off of work last week because he “can’t get out of bed in the morning.”

He first saw a psychiatrist ten days ago, and he was prescribed Zoloft 50mg. Mr. Davis says he has been taking the medicine regularly. He said he has been feeling more anxious and having more difficulty sleeping than before taking Zoloft and “thought about stopping it.” He said he attempted to contact his psychiatrist, but since it is the weekend, he has been unable to contact her at her office number.

--- Mental Health History ---

He reported thinking about suicide on one prior occasion at the age of 25 after a breakup with a girlfriend, but he did not make an attempt. Has never sought treatment for depression until ten days ago. He drinks “two glasses of wine at dinner once a week.” He denied illicit drug use.

--- Medical History ---

No major medical conditions.

--- Psychosocial History ---

Employed as a salesman. Divorced 6 months ago. Has a 3-year-old son who lives with his ex-wife in a neighboring state. Not currently in a relationship. Has family in the city and is close with one brother who lives in the city. Has few friends from work with whom he usually socializes, but not lately.

--- Family History ---

Father is an “alcoholic”

Sister takes Paxil for “stress”
No family history of suicides or psychiatric hospitalization.

--- **Mental Status Exam** ---

Appearance- looks like he has not shaved in several days
Behavior- mild psychomotor agitation (fidget, can't sit still)
Mood- “depressed,” “nervous”
Affect- congruent with self-report
Speech- slow rate
Thought process- linear
Thought content- (+) suicidal ideation, and thoughts of “shooting myself in the head.” He said, “I would never do it because I want to be here for my son”
No homicidal ideation
No delusions were endorsed
Perceptions- no auditory or visual hallucinations
Cognition- no objective impairment
Insight- good (he knows he is depressed and seeks treatment)

--- **Additional Information** ---

I was able to contact Mr. Davis' current psychiatrist. She said that Mr. Davis was scheduled for another appointment in three weeks; but that she has an opening in her schedule and he could come to her office in one week for an earlier appointment if needed. She indicated she would write and call in a prescription for Clonazepam 0.5mg po bid, 30 pills, no refill for symptoms potentially resulting from Zoloft side effects.

--- **Assessment** ---

1. Major Depression, recurrent, moderate severity
2. Adjustment issues (divorce)
3. Increased anxiety/insomnia since starting Zoloft is likely an early side-effect of Zoloft, per treating MD
4. Although Mr. Davis was initially interested in hospitalization, when I explained that his anxiety was likely a side-effect of Zoloft that could improve with time and a brief course of an additional medication, he endorsed feeling hopeful and said he would rather go home.

--- **Plan** ---

1. Pt indicated he would continue to take anti-depressant medication as prescribed, and he would immediately pick up and start taking Clonazepam as prescribed/recommended by treating MD
2. Follow-up with regular psychiatrist in one week
3. Return to the ER if/as needed.

END OF HOSPITAL CHART

Suicide Risk Assessment Practice Survey**--- Case Background ---**

A patient presented to a hospital emergency room with a chief complaint of suicidal ideation. He was released with directions to follow-up with his outpatient psychiatrist.

--- Case Outcome ---

Two days after the psychologist in the emergency room assessed him, the patient committed suicide by shooting himself with a gun.

Below is a reproduction of the hospital chart with the note that the evaluating psychologist wrote after assessing the patient. Please review the case and answer the questions that follow the case.

BEGINNING OF HOSPITAL ER CONTACT SUMMARY**--- Chief Complaint ---**

“I’m feeling worse.” “I’m having suicidal thoughts.”

--- History of Present Illness ---

Mr. Davis is a 34-year-old Caucasian man who arrived alone at the ER at 10:30PM. He reported feeling depressed for the last three months but “started getting worse” in the last week. He has been having thoughts about “shooting himself in the head to end it all.” He has felt slowed down, has had difficulty concentrating, and has lost ten pounds over the last three months. He took a few days off of work last week because he “can’t get out of bed in the morning.”

He first saw a psychiatrist ten days ago, and he was prescribed Zoloft 50mg. Mr. Davis says he has been taking the medicine regularly. He said he has been feeling more anxious and having more difficulty sleeping than before taking Zoloft and “thought about stopping it.” He said he attempted to contact his psychiatrist, but since it is the weekend, he has been unable to contact her at her office number.

--- Mental Health History ---

He reported thinking about suicide on one prior occasion at the age of 25 after a breakup with a girlfriend, but he did not make an attempt. Has never sought treatment for depression until ten days ago. He drinks “two glasses of wine at dinner once a week.” He denied illicit drug use.

--- Medical History ---

No major medical conditions.

--- Psychosocial History ---

Employed as a salesman. Divorced 6 months ago. Has a 3-year-old son who lives with his ex-wife in a neighboring state. Not currently in a relationship. Has family in the city and is close with one brother who lives in the city. Has few friends from work with whom he usually socializes, but not lately.

--- Family History ---

Father is an “alcoholic”
 Sister takes Paxil for “stress”
 No family history of suicides or psychiatric hospitalizations

--- Mental Status Exam ---

Appearance- looks like he has not shaved in several days
 Behavior- mild psychomotor agitation (fidget, can't sit still)
 Mood- “depressed,” “nervous”
 Affect- congruent with self-report
 Speech- slow rate
 Thought process- linear
 Thought content- (+) suicidal ideation, and thoughts of “shooting myself in the head.” He said, “I would never do it because I want to be here for my son”
 No homicidal ideation
 No delusions were endorsed
 Perceptions- no auditory or visual hallucinations
 Cognition- no objective impairment
 Insight- good (he knows he is depressed and seeks treatment)

--- Additional Information ---

I was able to contact Mr. Davis' current psychiatrist. She said that Mr. Davis was scheduled for another appointment in three weeks; but that she has an opening in her schedule and he could come to her office in one week for an earlier appointment if needed. She indicated she would write and call in a prescription for Clonazepam 0.5mg po bid, 30 pills, no refill for symptoms potentially resulting from Zoloft side effects.

--- Assessment ---

1. Major Depression, recurrent, moderate severity
2. Adjustment issues (divorce)
3. Increased anxiety/insomnia since starting Zoloft is likely an early side-effect of Zoloft, per treating MD
4. Although Mr. Davis was initially interested in hospitalization, when I explained that his anxiety was likely a side-effect of Zoloft that could improve with time and a brief course of an additional medication, he endorsed feeling hopeful and said he would rather go home.

--- Plan ---

1. Pt indicated he would continue to take anti-depressant medication as prescribed, and he would immediately pick up and start taking Clonazepam as prescribed/recommended by treating MD
2. Follow-up with regular psychiatrist in one week
3. Return to the ER if/as needed.

END OF HOSPITAL CHART

Appendix C: Questionnaires

In this case, did the psychologist have a duty to assess the patient's likelihood of committing suicide? yes no

Please classify the patient in terms of suicide-risk at the time he was released from the hospital.

1	2	3	4	5	6	7
Low Risk			Moderate Risk			High Risk

Given the information presented in the case material, what would you have predicted the outcome of this incident was likely to be?

Patient would commit suicide Patient would not commit suicide

Please indicate three to four reasons why that is your prediction regarding the outcome of this incident.

Please indicate your agreement or disagreement with the following statement:

The psychologist should have done more to ensure violence did not occur.

1	2	3	4	5	6	7
Strongly Disagree			Moderately Agree			Strongly Agree

How would you rate the psychologist's overall assessment?

1	2	3	4	5	6	7
Not Negligent			Moderately Negligent			Very Negligent

If you had to make a final decision about the negligence of this psychologist, what would you decide?

this psychologist was not negligent in performing his/her professional duty

this psychologist was negligent in performing his/her professional duty

Below is a list of actions, which psychologists may try; the psychologist already may have used some of the actions below in this case. Please check any additional or alternative actions you think this psychologist should have taken:

sought independent evaluation from another professional

ordered psychological tests

notified the patient's family or friends

informed the police

recommended or initiated voluntary hospitalization

recommended or initiated involuntary hospitalization

initiated, increased, or altered medication for the patient

decline or terminated treatment

other (please explain) _____,

Table 1

Demographic Information for Sub-samples

		Total Sample	June 2015	June 2016	November 2016
N (%)		95	37 (39%)	43 (45%)	15 (16%)
Gender	Male	34 (36%)	11 (30%)	13 (30%)	10 (66%)
	Female	61 (64%)	26 (70%)	30 (70%)	5 (33%)
Age M (SD)		41.37 (14.12)	38.11 (11.88)	39.79 (14.11)	33.00 (8.64)
Country	USA	72 (76%)	32 (87%)	26 (60%)	14 (93.3%)
	Canada	6 (6%)	1 (2.7%)	3 (7%)	1 (6.7%)
	Australia	6 (6%)	1 (2.7%)	5 (11.6%)	0
	Other	12 (13%)	3 (8.1%)	1 (2.3%)	0
Highest Degree	PhD	28 (30%)	10 (27%)	8 (18.6%)	10 (66.7%)
	PsyD	16 (17%)	9 (24.3%)	4 (9.3%)	3 (20%)
	MD	3 (3%)	1 (2.7%)	2 (4.7%)	0
	MA/MSW	30 (32%)	4 (19%)	8 (18.6%)	0
	Other/Missing	25 (26%)	8 (27%)	7 (16%)	1 (6.7%)
Years in Profession	M (SD)	13.00 (11.26)	10.09 (10.31)	12.74 (10.97)	16.80 (11.69)
	Range	0 - 40	0 - 36	0 - 40	4-39
Years Experience Conducting Forensic Evaluation	M (SD)	8.58 (9.82)	8.80 (7.18)	6.44 (8.91)	10.61 (10.06)
	Range	0 - 37	0 - 34	0 - 35	3 - 37

Table 2

Demographic Information for Experimental Groups

		Total Sample	Homicide Hindsight	Homicide Foresight	Suicide Hindsight	Suicide Foresight
N (%)		95	21 (22%)	25 (26%)	26 (27%)	23 (24%)
Gender	Male	34 (36%)	7 (33%)	6 (24%)	14 (54%)	7 (30%)
	Female	61 (64%)	14 (66%)	19 (76%)	12 (46%)	16 (70%)
Age M (SD)		41.37 (14.12)	40.19 (14.49)	43.04 (15.05)	33.00(8.64)	45.61 (13.10)
Country	USA	72 (76%)	18 (86%)	15 (60%)	22 (85%)	17 (74%)
	Canada	6 (6%)	0	1 (4%)	2 (8%)	3 (13%)
	Australia	6 (6%)	2 (10%)	4 (16%)	0	0
	Other	12 (13%)	1 (4%)	5 (20%)	3 (7 %)	3 (13%)
Highest Degree	PhD	28 (30%)	6 (29%)	5 (20%)	7 (27%)	10 (44%)
	PsyD	16 (17%)	4 (19%)	3 (12%)	5 (19%)	4 (17%)
	MD	3 (3%)	1 (5%)	0	2 (8 %)	0
	MA/MSW	30 (32%)	4 (19%)	7 (28%)	10 (40%)	9 (13%)
	Other/Missing	25 (26%)	6 (28%)	10 (40%)	3 (6%)	6 (26%)
Years in Profession	M (SD)	13.00 (11.26)	10.58 (12.02)	15.20 (11.34)	8.75 (9.66)	12.58 (11.43)
	Range	0 - 40	0 - 40	0 - 36	1 - 30	2 - 39
Years Experience Conducting Forensic Evaluation	M (SD)	8.58 (9.82)	7.79 (9.21)	9.33 (11.08)	4.37 (4.71) *	12.57 (11.42) *
	Range	0 - 37	0 - 35	0 - 34	0 - 18	0 - 37

Note. * $p < .05$.

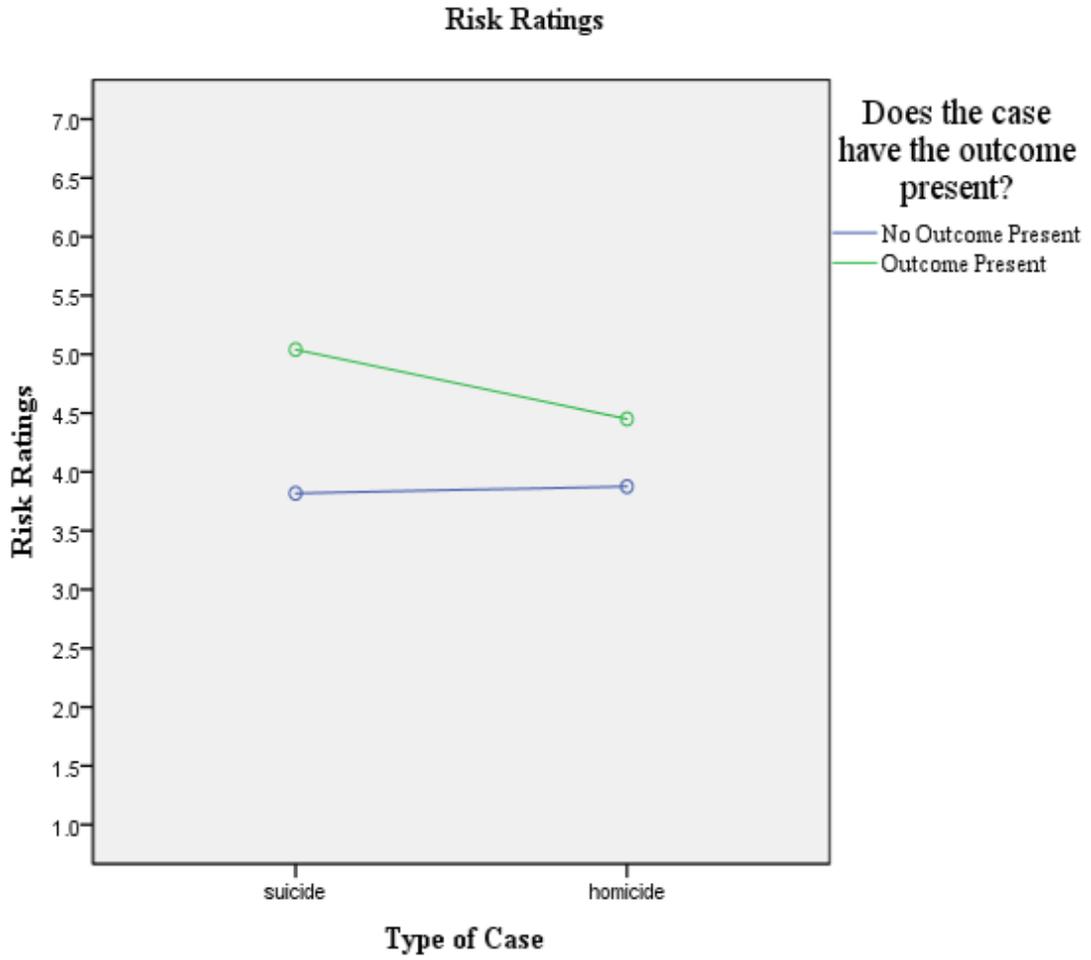


Figure 1. Mean Risk Rating for outcome and no outcome based on case type.

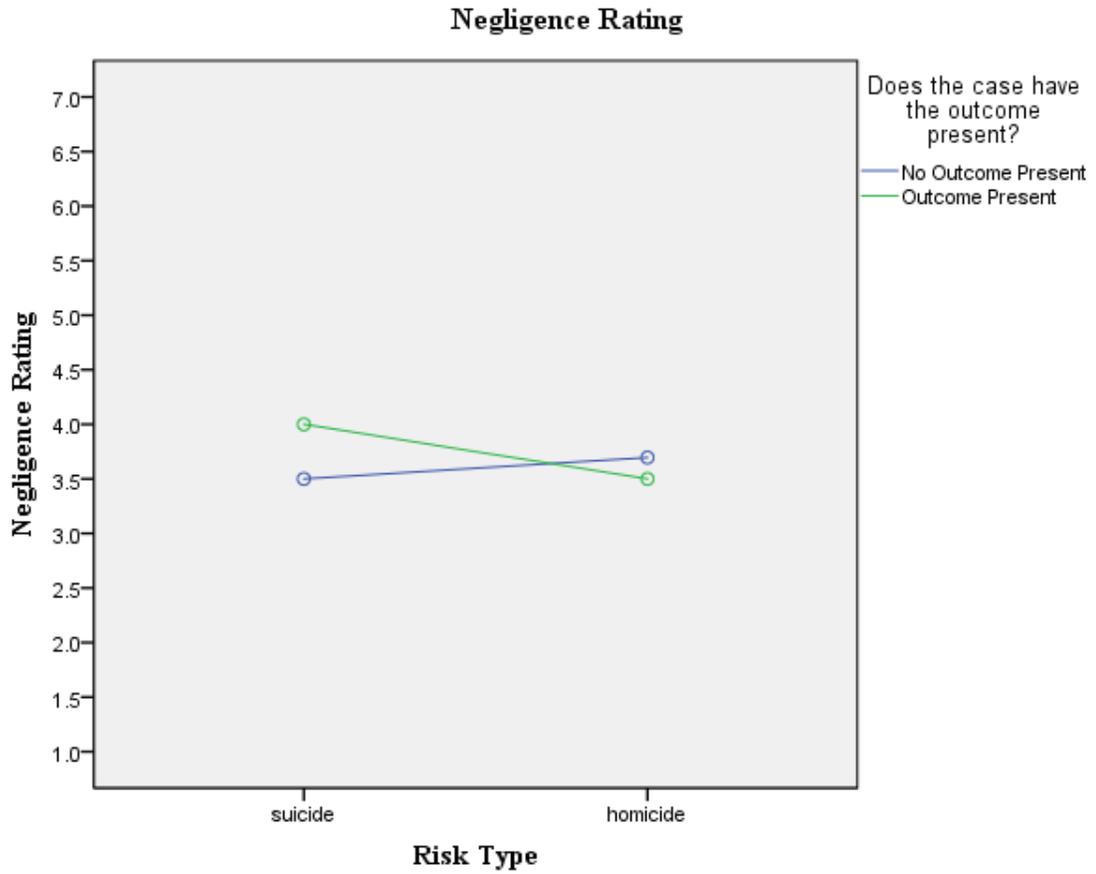


Figure 2. Mean Negligence Rating for outcome versus no outcome based on case type.