

**ALTERED RISK JUDGMENTS: SOURCE CREDIBILITY
OF VIOLENCE RISK ASSESSMENT METHODS**

by

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ABSTRACT

This study examines source credibility of violence risk assessments made using two methods: actuarial assessment and structured professional judgment (SPJ). Data were collected in an online study of violence risk to a university population (N =174). Source credibility (Meyer, 1988) was evaluated as an antecedent variable to Eagly and Chaiken's (1993) heuristic-systematic model (HSM) of information processing. The impact of motivation for accurate information was assessed. Source credibility of violence risk assessment methods was similar on a superficial level but different underlying structures were detected. Analysis of the full model revealed notable differences in model fit when source credibility factor scores ($\chi^2 = 16.693, p = .005, \text{Nagelkerke } R^2 = .124$) were included in the model. Accuracy motivation was predictive of risk decisions ($\beta = .602, \text{CI} = [.412, .880], p < .054$). Results indicate that both perceived credibility of the method and motivation for accurate information impact risk judgments.

Keywords: risk assessment; violence; source credibility; information processing; heuristic-systematic processing

Subject Terms: violence risk – forecasting; violence – United States; violence – Canada; risk assessment – United States; risk assessment - Canada

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TABLE OF CONTENTS

Approval	ii
Abstract	iii
Acknowledgements	iv
Table of Contents	v
Introduction	1
Source Credibility	4
The Heuristic-Systematic Model of Information Processing.....	7
Exogenous Variables	8
Information Processing	9
Models	10
Research Questions.....	11
Method	12
Participants	12
Procedure	12
Measures	14
Meyer's Credibility Index.....	14
Heuristic and Systematic Information Processing	15
Information Sufficiency	16
Accuracy Motivation	16
Risk Perceptions	17
Paulhus Deception Scales	18
Missing Data	19
Validity Checks.....	20
Multivariate Outliers	20
Data Analysis	21
Results	23
Does Source Credibility Vary as a Function of Risk Assessment Method and Risk Levels?	23
What is the Impact of Source Credibility on Risk Judgments?.....	25
Risk Judgments.....	25
Information Processing	26

The Full Model	27
Discussion.....	31
Limitations and Suggestions for Future Research	33
Appendices	36
Appendix A.....	37
Vignette: AA/ Both Risk Conditions.....	37
Vignette: SPJ/ Both Risk Conditions	38
Appendix B.....	40
Meyer’s Credibility Index (1988).....	40
Accuracy Motivation.....	41
Information Sufficiency.....	41
Systematic Processing.....	42
Heuristic Processing	43
Risk Perception Questionnaire.....	44
Appendix C	45
Table C1. Correlations Among Source Credibility Items.....	45
Table C2. Factor Analysis of Source Credibility of Actuarial Assessment (N = 89).....	45
Table C3. Factor Analysis of Source Credibility of SPJ (N = 85).....	46
Appendix D	47
Table D1. Correlations of Risk Decisions, Source Credibility Average, and Source Credibility Factor Scores (N = 174).....	47
Table D2. Logistic regression of Source Credibility Average and Factor Scores on Risk Decisions	47
Table D3: Hierarchical Logistic Regression on Risk Decisions.....	48
Table D4: Hierarchical Regression on Risk Perception (Item 1, Perceived Control)	50
References	53

INTRODUCTION

"Our lives teem with numbers, but we sometimes forget numbers are only tools. They have no soul: they may indeed become fetishes." – Peter L.

Bernstein

Assessment of risk to reoffend is an integral task for forensic mental health professionals who work with violent offenders. Decisions must be made regarding interventions and risk of violence for which risk assessment methods are vital. Often, risk information obtained from violence risk assessment must be communicated to legal decision makers, such as judges, juries, and parole committees. Much debate about violence risk has focused extensively on which assessment methods are the most accurate at predicting violent behavior. Interpretation and use of information about violence risk is a relatively unexplored but important aspect to effective risk management.

The focus of the present study is credibility of violence risk assessment methods, independent of the credibility of the forensic mental health professionals responsible for estimating and communicating risk. Previous research has explored the credibility of forensic mental health professionals as expert witnesses, yet the perceived credibility of the risk assessment method has been neglected as a topic of research. This study examines the impact of credibility of risk assessment methods on risk decisions. Credibility is assessed along the subconcepts of trust, accuracy, bias, comprehensiveness, and

fairness, as conceptualized by Meyer (1988). The term “source credibility” represents the specific domain of credibility measured by the preceding five subconcepts.

Two widely used methods of risk assessment were examined in this study: actuarial assessment and clinical judgment. Actuarial assessment assigns a statistical probability of risk to an individual based on rigorously tested and predictive item responses. Grove and Meehl (1996) describe actuarial assessment as a “formal method” that “uses an equation, a formula, a graph, or an actuarial table to arrive at a probability, or expected value, of some outcome” (p. 294). In contrast, Grove and Meehl describe clinical judgment as “informal,..impressionistic, and subjective conclusion” (p. 296). A new approach to clinical judgment, structured professional judgment (SPJ), provides guidelines for clinicians to estimate and manage risk. The SPJ approach attempts to tailor assessment results to the individual with guided expert analysis of risk and protective factors present in the individual case. SPJ was also developed to address weaknesses in the actuarial approach, such as the perceived inability of actuarial assessment to deal with dynamic, individual variables, lack of guidance regarding risk management strategies, and problems with interpretation of probability estimates. Actuarial assessment can be used to manage risk as well but was not developed with this intention (Hart, 2001). Both actuarial assessment and SPJ are used in practice to evaluate violence risk; actuarial assessment attempts to estimate risk from past behavior using empirically derived algorithms, while SPJ attempts to help clinicians estimate manage risk by

analyzing dynamic, individual risk and protective factors. SPJ provides guidelines for forensic mental health professionals to achieve both risk estimates and management strategies. Essentially, SPJ "evaluators...are asked to assume a) the more risk factors that are individually relevant to a person's violent behavior, the higher the risk and b) the greater degree of intervention required to stem the person's risk of violence, the higher the risk"(Heilbrun, K., Douglas, K. & Yasuhara, K., under revision).

Structured professional judgment is a new take on clinical judgment. As such, SPJ measures have been evaluated for empirical validity in comparison to actuarial formats. In previous studies, SPJ ratings were found to be predictive of violence, above and beyond the predictive validity of a numerical sum of items (Kropp & Hart, 2001; Douglas, Ogloff, & Hart, 2003). Risk communication preferences and the impact of probability versus frequency formats has been investigated generally (Gigerenzer, 1994) and in the context of violence risk communication (Heilbrun, Dvoskin, Hart, & McNeil, 1999; Slovic, Monahan, & MacGregor, 2000). A recent study on judicial decision making (Kwartner, Lyons, & Boccaccini, 2006) found that judges prefer to receive violence risk information in both categorical and numerical formats,. Douglas and Ogloff (2003) studied rater confidence of actuarial and SPJ assessments and found that higher confidence ratings correspond to better accuracy in both methods. Further exploration of risk assessment methods may illuminate the link between the decision making process and understanding of risk information.

Research on expert witness testimony indicates that credibility of the witness is an important factor in juror information processing and risk decisions (Krauss & Sales, 2001; Krauss, Lieberman, & Olson, 2004). Krauss and others propose that source credibility impacts risk decisions by increasing heuristic information processing. Briefly, heuristic information processing is a shortcut form of processing that depends primarily on cues rather than analysis of information. Source credibility can behave as a cue for heuristic processing because it allows people to rely on the judgment of experts. Expert judgment formed by actuarial assessment and SPJ is based on different principles and forms of communication. It follows that the credibility of the methods themselves (rather than expert testimony) may impact the way decision makers process and interpret information about violence risk. Increasing use of SPJ in violence risk assessment warrants investigation into how people interpret information from this source. One such measure, the HCR-20 (Webster, C., Douglas, K., Eaves, D., & Hart, S., 1997), has been widely incorporated into research and practice with a rapidly expanding bibliography (Douglas Guy, & Weir, 2007), emphasizing the importance of understanding how different risk assessment methods may impact risk decisions.

Source Credibility

Credibility of risk information estimated and communicated by expert witnesses is a topic of investigation in forensic settings. Potential jurors tend to believe that clinicians can predict future dangerousness with experience and training, despite frequent warnings from professionals and researchers that risk

assessments made using unstructured clinical judgment are not much better than chance in terms of reliability and validity (Morier, 1987). Krauss and others (Krauss & Lee, 2003; Krauss & Sales, 2001) found that jurors placed more emphasis on clinical expert testimony than expert testimony supported by an actuarial assessment tool, despite the higher standards the latter form of testimony must meet in court. These findings suggest that jurors have difficulty determining whether expert testimony is scientifically sound and lack appreciation for the standards required by the courts. Because unstructured clinical judgment appears to be less accurate than actuarial assessments of risk (Rice, 1997; Rice & Harris, 1995), the influence jurors afforded to clinical expert testimony is of concern. As a newer risk assessment method, SPJ has only recently been studied in the context of expert witness testimony (Krauss et al., 2004). The results of this study revealed no differences in credibility of testimony based on actuarial assessment, unstructured clinical judgment, and SPJ. Expert testimony was controlled in the study for level of training, accomplishments, and accreditation, among other variables. However, credibility measures were designed to ascertain credibility of the testimony rather than credibility of the risk assessments that formed the foundation of the experts' opinions. The similar levels of credibility across risk assessment methods may be a result of the similar expert witness information. Direct measurement of the source credibility of risk assessment methods may reveal differences in face validity of these methods.

Additional information on source credibility and risk comes from research in the health, industrial, and environmental domains of risk communication

(Pittinger, Brennan, & Badger, 2003; Peters, Covello, & McCallum, 1997; Siegrist & Cvetkovich, 2001). Three studies of the impact of a scientific report of health risks on perceptions found that when the report indicated significant health risks, participants were more likely to trust the report and had greater confidence in the results than if reported risks were low (Siegrist & Cvetkovich, 2001). This effect held across varying levels of report credibility. The results imply that participants give more influence to reports of greater risk. Consequently, risk level is an important consideration when estimating relationships among source credibility and other variables. In a survey study of cancer cluster risk caused by industrial development, Johnson (2005) found that source credibility directly accounted for approximately two-thirds of the variance in risk perception. Trumbo and McComas (2003) tested the effects of source credibility on risk perception of environmental risks. They found a small amount of the effect of source credibility on risk perception that was mediated by information processing: When source credibility of industry or government groups was high, individuals were more likely to use heuristic processing and perceive lower risk levels; however, when source credibility of citizen's groups was high, individuals were more likely to use systematic processing and perceive higher risk levels. The results imply that the association between source credibility and risk judgments may change as a function of information processing. Previous research supports the inclusion of information processing in the model of source credibility and perception to elucidate the processes involved.

The Heuristic-Systematic Model of Information Processing

Several dual-process theories of information processing (Osman, 2004; Pryor, 2006) have been used to explain risk perception differences in risk communication (Slovik, Peters, Finucane, & MacGregor, 2005). One such model, the heuristic–systematic model (HSM) of information processing, conceptualizes information processing pathways as either heuristic or systematic (Chaiken et al., 1989; Eagly & Chaiken, 1993). Heuristic processing involves reliance on shortcuts such as credibility to develop attitudes and make decisions. Conversely, systematic processing is an analytic approach to attitude formation that is used when motivation to make sound decisions and the desire for accurate information are present to a high degree. The HSM has been studied for the last three decades, with recent work investigating the HSM as a component of risk judgments (Trumbo, 1999; Griffin, Neuwirth, Giese, & Dunwoody, 2002). The pathways can be utilized either independently or simultaneously to varying degrees (Chaiken et al., 1989; Johnson, 2005). For example, compelling levels of credibility may lead to heuristic processing, but the degree of heuristic processing is tempered by a preference for accuracy that is not met by the evidence provided. Essentially, as applied in the context of violence risk assessment, the credibility of the assessment tool or expert witness would support the case only so far in the face of lackluster or scant evidence. The HSM is an appealing model for risk decision making because it can be evaluated from a relatively simple perspective (heuristic or systematic

processing) but also lends itself to a more complex and interactive interpretation (heuristic and systematic processing).

Exogenous Variables

The HSM is an evolving model with several possible exogenous variables (Eagly & Chaiken, 1999) including information sufficiency (Griffin, Neuwirth, Dunwoody, & Giese 2004; Neuwirth et al., 2003), accuracy motivation (Trumbo, 1999), and source credibility (McComas & Trumbo, 2003; Trumbo & McComas, 2003). Information sufficiency represents the balance between what individuals know about a risk and what they feel they need to know (Griffin et al., 2004; Neuwirth et al., 2003). Information sufficiency can be considered a measure of the information threshold needed to make a decision about risk. Accuracy motivation provides information about the valence of information sufficiency; as accuracy motivation increases, the information threshold becomes higher. In this case, the amount of information desired for decision making is often greater than the information provided. Previous research indicates that heuristic processing is associated with lower accuracy motivation and lower risk perceptions (Johnson, 2005; Trumbo, 1999, 2002; Trumbo & McComas, 2003). The results suggest that when the information provided exceeds information desired, individuals are more likely to process heuristically and perceive the situation as low risk. Conversely, systematic processing is associated with higher accuracy motivation and the perception of greater risk.

Information Processing

A precedent exists for a model of information processing in forensic judgments. Information processing has been evaluated in the context of mock jury perceptions of dangerousness (Krauss & Lee, 2003; Krauss & Sales, 2001; Krauss, Lieberman, & Olson, 2004). Specifically, in these studies, mock jurors placed more weight on unstructured clinical expert testimony as opposed to actuarial testimony in death penalty cases. But in a study of sexually violent predator proceedings, the weight accorded to clinical and actuarial testimony was equivalent (Guy & Edens, 2001). Krauss and others (2003; 2001) theorized that the preference for clinical expert testimony in death penalty cases resulted from the relative complexity of the actuarial testimony. To follow up this theory, Krauss and others (2004) conducted another study to evaluate the effects of rational processing on perceptions of dangerousness. The authors used a dual-process theory called Cognitive-Experiential Self Theory (CEST; Epstein, 1994; Epstein & Pacini, 1999). The theory is similar to the HSM in that there are two processing modes, one that is quicker and more superficial (experiential) and one that is more analytical in nature (rational). Participants were primed for rational processing by a sheet of math problems or for experiential processing by completing a survey of current emotions. As expected, higher risk ratings occurred when unstructured clinical testimony was presented after experiential priming, and when actuarial testimony was presented after rational priming. The SPJ testimony resulted in lower risk ratings than either clinical or actuarial testimony, with a small decrease in dangerousness ratings for rational priming relevant to experiential priming. Irrespective of priming, participants felt that

actuarially-based and SPJ expert testimony was more scientific than unstructured clinical expert testimony. The results suggest that participants in the experiential priming condition were aware that clinical testimony was less scientific but allowed it to influence their perceptions regardless. There were no differences in the measures of confidence, influence, or credibility.

The present study attempts to further elucidate the association between source credibility and information processing by focusing on risk assessment methods themselves and directly assessing information processing choices.

Models

The present study tested an adaptation of Trumbo's (2002) conceptualization of HSM by incorporating source credibility of risk assessment methods, information sufficiency, and accuracy motivation as antecedent variables of interest. The inclusion of antecedent variables allowed an analysis of individual differences when processing risk information. The association between source credibility and risk judgments (perceptions and decisions) was explored, followed by an examination of information processing as a moderator. Information processing was conceptualized as both separate measures and a single continuous measure with the two anchors representing heuristic and systematic processing. The study evaluated the proposed models by providing participants with a relevant hypothetical scenario involving a risk decision. The scenario concerns a person previous convicted of a violent offense (assault) applying for campus housing. Participants then decided whether housing should be provided to the applicant based on risk assessment information. The study

materials were provided in an online format to maintain anonymity and encourage participation.

Research Questions

The primary focus of the present study was to examine source credibility of two methods of risk assessment: actuarial assessment versus SPJ. Two research questions were formulated to explore the topic:

1. Does source credibility vary as a function of risk assessment method and risk level?
2. *What is the impact of source credibility on risk judgments?*

METHOD

Participants

Participants (N = 205) were recruited through the undergraduate subject pool operated by the Department of Psychology, Simon Fraser University, which comprises students enrolled in psychology courses who have volunteered to participate in a range of studies. After excluding participants with potentially problematic data according to validity checks and multivariate outlier analysis (discussed below), the final sample comprised 174 undergraduates. The participants comprised primarily females (65.5%) of Asian (54%) or Caucasian (30%) descent. Most participants were aged 19 to 24 years (73%).

Procedure

The procedure was designed as a first-stage investigation into cognitive processes engaged by violence risk information. As such, an online presentation of the study procedure was deemed sufficient. An online presentation provides both convenience and anonymity for participants.

The study was presented using the Simon Fraser University Websurvey Tool. Participants were presented with variations of a vignette designed to be relevant to undergraduates at the University. The study design consisted of four conditions as follows: 1) actuarial assessment/low risk (i.e., 10% probability of recidivism), 2) actuarial assessment/medium risk (i.e., 50% , 3) SPJ/low risk, and

4) SPJ/medium risk. Risk levels of 10% or low and 50% or medium were chosen to reduce magnitude of effects, such as those produced by a comparison among low and high risk levels (Sandman, Weinstein, & Miller, 1994). Power analysis prior to data collection indicated that medium effect sizes could be detected with a high degree of interpretive certainty. Procedures were tested in a pilot study of 46 participants from the university population.

Participants were randomly assigned to one cell each. Random assignment consisted of 40 sets, each containing a single instance of each of condition. Vignettes were presented prior to a dichotomous decision-making task (Appendix A). Vignettes were consistent across conditions excepting the manipulated variables of risk assessment type and risk level. Each participant was presented with a hypothetical decision-making scenario involving a person who had been convicted of a series of burglaries and one violent crime, a physical assault. Descriptions of actuarial assessment and SPJ assessment procedures were provided subsequent to a list of 5 questions about the past behavior of the applicant. The five items were chosen to be easily understood by participants with limited to no knowledge of violence risk assessment. The aim of limiting the risk assessment items was to avoid evaluations of item validity rather than risk assessment procedures and risk levels, and to prevent information complexity from interfering with information processing and perceived credibility (Krauss & Sales, 2001). Evaluations of this sort could confound results of the study. As with other dependant variables in the study, the five items were the same across conditions. Subsequent to the vignette presentation, participants

were asked to complete several measures including: 1) a source credibility index, 2) a measure of heuristic and systematic information processing, 3) a measure of motivation for accurate information and information sufficiency, 4) a risk perception measure and 5) a response validity check. The risk decision-making task was presented immediately prior to the source credibility index. Presenting the risk decision subsequent to the first measure was designed to transition participants from passive to active information processing.

Measures

Five measures were gathered from previous research. The survey contained 64 items in total. The complete measures are available in Appendix B. Some measures were reverse-scored to simplify interpretation.

Meyer's Credibility Index

The first measure was Meyer's Credibility Index (Meyer, 1988). The Credibility Index consists of 5 items rated on a 5-point semantic differential scale (1 = high credibility, 5 = low credibility). Originally designed to measure the credibility of various newspapers, the index has provided useful information about risk communication (McComas & Trumbo, 2001). The index has acceptable internal reliability and high validity in environment and health risk communication settings (McComas & Trumbo, 2001; Trumbo & McComas, 2003). Factor analysis in these studies revealed all 5 indicators loaded on one factor. Previous studies indicated strong correlations between the Credibility Index and various risk perception items. Additional studies revealed low to

moderate association among source credibility and HSM measures (McComas & Trumbo, 2001; Trumbo & McComas, 2003).

Moderate internal consistency reliability of the source credibility index was detected in the current sample ($\alpha = .56$). As alpha depends in part on the number of items in the scale, the mean inter-item correlation ($\alpha = .20$) was calculated to confirm item homogeneity. Factor analytic procedures were implemented for the measure to address possible problems with it.

Heuristic and Systematic Information Processing

Heuristic and systematic information processing was measured with questions derived from previous work on the HSM (Griffin et al., 1999, Johnson, 2005, Neuwirth et al, etc). The information processing scale consisted of nine items on a 5-item Likert scale (1 = strongly agree, 5 = strongly disagree). Five items measured systematic processing and four items measured heuristic processing (see Appendix B). The items were chosen to have applicability to the study context. Specifically, the items were chosen for an isolated instance of risk communication, where concern about the specific risk is unlikely to be present prior to the study. Seven of the items came from a measure derived by Johnson (2005) and two items were selected from Neuwirth's (2002) measure. The internal consistency reliability of the systematic measure was acceptable ($\alpha = .706$) but poor for the heuristic measure ($\alpha = .375$). Analysis of the correlation matrix revealed that item three of the heuristic measure correlated very poorly with the other heuristic items. When item three of the heuristic measure was

removed, reliability increased to .562. The modified scale was used in subsequent analysis. The preceding reliability coefficients supported factor analytic procedures to detect underlying associations among items.

Information Sufficiency

Information sufficiency can be conceptualized as a sufficiency threshold, in that individuals must reconcile the information they have with the amount and quality of information they feel is sufficient (Chaiken et al, 1996). Two items assessed information sufficiency: 1) "How much do you think you know about this risk?" and 2) "How much do you need to know about this risk?" Items were rated on an 11-point Likert scale (0 = know very little, 10 = know a great deal). The items were moderately to highly predictive of the heuristic and systematic processing items in Neuwirth's study (2002) but no information was provided on reliability of the items as an information sufficiency measure. In the present study, the items were positively correlated ($r = .18, p < .01$). Both items were included in further analysis.

Accuracy Motivation

Valence of information processing can be influenced by a variety of motives (Chaiken et al, 1996). Accuracy motivation is one such motivation. Specifically, participants in decision-making tasks place varying emphasis on the accuracy of information received. High levels of accuracy motivation lead to systematic processing, while low levels decrease systematic processing. Accuracy motivation was assessed to detect perceptions of the accuracy of risk

information presented by AA and SPJ. The variable was assessed by two items modified from previous research: 1) "This is an important issue, and it is very important to me to decide how I feel about the risk from this student" (Trumbo, 2002) and 2) "I find myself trying to decide whether the information I get from the risk assessment about this issue is accurate" (Neuwirth et al., 2002). Items were rated on a 5-point Likert scale (1 = strongly agree, 5 = strongly disagree). Both items were moderately-to-highly predictive of information processing. These two items have not been combined in previous research; consequently, no information existed about reliability of the items as a single measure prior to this study. The two Accuracy Motivation items were correlated at a small-moderate level ($r = .20$, $p < .006$). Both items were included in subsequent analyses.

Risk Perceptions

Research on violence risk perception in questionnaire format is limited. Therefore, risk perception was assessed using a 10-item questionnaire adapted from a 19-item measure developed by Slovic and others (1985; as cited in Trumbo, 1996, 1999). The adapted questionnaire is a highly reliable measure. Several versions of this questionnaire exist in the literature (Trumbo, 1996, 1999, 2002; Trumbo & McComas, 2003). The version most relevant to the context of the present study was derived from Trumbo's 1999 version. The selected version includes measures of control over risk, awareness, dread, and risk to person scored on a 7-point semantic differential scale. Three items from the original questionnaire were removed because they referred to risks associated with industrial contamination specifically (i.e. catastrophic death and destruction). In

addition, the semantic scale was reduced to a 3- point semantic differential scale (1 = not true, 2 = somewhat true, 3 = very true; 1 = decreasing, 2 = staying the same, 3 = increasing; 1 = no control, 2 = some control, 3 = a lot of control; 1 = no choice, 2 = some choice, 3 = a lot of choice; 1 = not aware, 2 = somewhat aware, 3 = very aware). Pilot testing revealed little variation in responses on the original 7-point scale, indicating that simplifying the scale would not result in significant data loss. Despite the adjustments (or perhaps because of them), the scale has very low reliability ($\alpha = .272$). Review of the correlation matrix revealed that two items achieved low correlations with the other items ($r = .103$ and $.100$). The items covered perceived control and risk to person, so it is surprising that they did not correlate well with other measures. The two items were dropped from the additive index, leaving 5 items. The new index achieved reliability of $.345$. The low-to-moderate correlations among the items and low reliability suggested that the items should be evaluated separately or perhaps hierarchically. Due to the large amount of measurement error, preliminary evaluations were undertaken prior to data reduction procedure to ascertain if this procedure was appropriate for the risk perception measure. The risk decision item was substituted for risk perceptions as a result.

Paulhus Deception Scales

The Paulhus Deception Scales (PDS) (Paulhus, 1988) were completed as a response validity check. Inclusion of this measure may increase reliability of the heuristic and systematic information processing measure by detecting social desirability, as participants may have been reluctant to admit that they skimmed

the information or did not spend much time thinking about it (Johnson, 2005). The PDS works generally as a validity check by assessing social desirability along two factors (Paulhus, 1991). These two factors encompass the current conception of social desirability, covering both self-deceptive enhancement and positive self-presentation (to a third party). The PDS has acceptable internal and external validity in undergraduate populations and is statistically related to its precursor, the Balanced Inventory of Desirable Responding (Lanyon & Carle, 2007).

Missing Data

Cases were analyzed to exclude any case that contained 40% or more missing data points. No cases met this criterion. A more restrictive plot was then created to detect 20% or more missing data points. Again, no cases met the criterion. A missing data analysis was conducted on pairings of variables. Pairwise percentages did not exceed 4% for any variable combination, which indicates that the pattern of missing variables is not systematic. Dichotomized pairwise correlations (0 = missing, 1 = present) supported nonsystematic missing variables. Two exceptions were found: the correlations between ethnicity and Item 1 of the accuracy motivation measure, and ethnicity and Item 2 of the heuristic processing measure. The correlations were substantially different from zero, $r = .57$ and $.32$, $p = .003$. This suggests that individuals who declined to provide ethnicity information were more likely to fail to answer these two items. Because no other missing data revealed systematic patterns, and the departures from zero of the two exceptions do not seem to have an obvious explanation, the

EM method of imputing missing values was used. The EM method is a type of regression imputation method with a long history of use (Bentler, 2006). EM imputation was performed on 25 cases.

Validity Checks

The Paulhus Deception Scales (PDS) provided a validity check for the measure. The Impression Management (IM) scale detects faking or lying. Faking or lying on a survey measure suggests that participants failed to provide accurate responses. As recommended (Paulhus, 1999), the IM scale was used as the primary validity check. Cut-off scores above 12 and below one resulted in 12 cases being removed from the data set. An additional 4 cases were removed for being outside of the approved score range for the PDS total score. The total score includes both the IM scale and the Self-Deceptive Enhancement scale. Sixteen respondents were removed from the data set in accordance with PDS cut-off scores for acceptable responses.

Multivariate Outliers

Probability plots and histograms of residuals were created and examined for evidence of outliers. Visually identified departures from normality were confirmed as outliers using Mahalanobis distances followed by Df-beta analysis. As a result of this procedure, sixteen outliers were removed and regression analyses were replicated.

Data Analysis

Data analytic procedures were verified as appropriate using standard recommendations (Cohen et al., 2003). All continuous variables were standardized into z-scores prior to analysis to simplify interpretation. Significance levels were evaluated in accordance with Cohen's 1984 recommendations. Power was sufficient for the correlations evaluated in these procedures, $r = .78$ for moderate effects and $.98$ for strong effects (Cohen et al., 2003). For regression effects, power was calculated for the largest number of predictors to be entered into a regression equation. The final sample size was 174, after completion of validity checks and outlier removals. With $k = 2$ (the largest set of predictors in a single set) and the estimated effect size between medium and large (Johnson, 2005; Trumbo, 1999, 2002; Trumbo & McComas, 2003), power was estimated at $.99$.

The sequence of analytic procedures was designed to examine the research questions in a systematic manner. The first phase of analysis began with a simple ANOVA on source credibility, risk assessment method, and risk level. The next step was to examine the underlying structure of the source credibility measure. Because source credibility has not been assessed previously in this context, the initial approach to analyzing underlying structure was conservative. Specifically, exploratory factor analysis (EFA) (principal components analysis) using Varimax rotation was followed by confirmatory factor analysis (CFA) using Oblimin rotation. Regression analysis followed ANOVAs when appropriate.

The final procedure was hierarchical analysis of the full model. Prior to including risk perceptions as an outcome, the measure was evaluated for internal reliability and appropriateness for factor analysis. Then the risk perception items were correlated with source credibility (total scores then factor scores). The heuristic and systematic processing measures were evaluated using similar procedures. Finally, predictors were hierarchically regressed on risk judgments (risk decisions and risk perceptions) in blocks.

RESULTS

Does Source Credibility Vary as a Function of Risk Assessment Method and Risk Levels?

Prior to statistical investigation of this question, risk information preferences were evaluated. Participants were asked what format they preferred for risk information. Answer choices were probability, category, both, and neither. The most popular preference was communication of risk information in both probability and category formats (40%). Probability format alone was nearly as popular (37%). A minority preferred to receive risk information as a category (17%). The remaining 5% disliked both methods of communication. These results indicate a possible bias toward actuarial assessment in this study. Conversely, the results suggest probability estimates alongside categories could have more influence on perceptions and decisions than probability estimates alone. Integration of probability and categorical formats is possible in SPJ. In this study, however, SPJ risk estimates were provided in category format only. Overall, the results imply a potential bias toward actuarial assessment and against SPJ in this study.

ANOVAs conducted on source credibility total scores revealed no notable differences for risk assessment method ($df = 1, F = .321, p = .572$) or risk level ($df = 1, F = 2.484, p = .117$). Although the source credibility means were similar across conditions, a further investigation of the underlying structure of source

credibility revealed interesting differences. Principle components analysis with Varimax rotation revealed differences in source credibility factor components for assessment methods. Prior to data reduction procedures, some preliminary evaluations were conducted. The source credibility items were moderately correlated (Table C1). However, KMO (.606) and Bartlett's test of sphericity ($\chi^2 = 102.587$, $v = 10$, $p < .001$) supported proceeding with the procedure. EFA revealed that differences in factor scores did exist across conditions (Tables C2 and C3). The results were then confirmed with CFA. Specifically, when SPJ cases were selected, the index separated into two factors contrary to expectations (eigenvalues: 1.871 and 1.201). The two factors explained 61% of the variance. The first factor score consisted of items 1, 2, and 3, and the second factor consisted of items 4 and 5. However, in actuarial assessment cases the factor loadings changed. Specifically, the first factor (eigenvalue = 1.866) consisted of items 1 and 2, while the second factor (eigenvalue = 1.250) consisted of items 3, 4, and 5. The two factors explained 62% of the variance. Factor scores supported by three or more strong indicators were saved for further analysis. The same ANOVAs were run with the factor scores. With a generous interpretation, factor 1 scores calculated on SPJ cases were significantly different across risk levels ($df = 1$, $F = 3.583$, $p < .06$). Factor 1 consisted of trustworthiness, accuracy, and fairness. Logistic regression revealed that in SPJ cases, a one-point increase in source credibility factor 1 scores increased the odds that a participant was in the low risk level condition ($\beta = 1.365$, $CI = [.985, 1.892]$, $p < .061$). Thus, it appears that SPJ was seen as

more trustworthy, accurate, and fair when risk was low. A similar relationship was not found between source credibility factors scores and risk level in actuarial assessment cases.

What is the Impact of Source Credibility on Risk Judgments?

Risk Judgments

Risk judgments were operationalized as both risk decisions and risk perceptions. Correlations between risk decisions and source credibility were notable, with increasing strength of relationship when moving from total scores to factor scores (Table D1). Logistic regression revealed a positive direction to the associations (Table D2). Risk decisions were split almost evenly between “yes” (51.7%) and “no”(48.3%). This is despite the fact that more participants were in the medium risk condition (52.9%) versus the low risk condition (47.1%). The difference between the two conditions in proportion of “yes” decisions approached statistical significance (Fisher’s Exact = .061). The split in decisions was wider in the low risk condition than in the medium risk condition, with 58.5% of participants deciding “yes” versus 41.5% deciding “no,” Decisions were almost evenly distributed in the low risk SPJ condition (51.2% vs. 48.8%). However, in low risk actuarial assessment conditions, participants decided “yes” almost twice as often as “no” (65.9% vs. 34.1%). Decision splits were largely equivalent for both risk assessment methods in the medium risk conditions, where a proportion slightly above 50% decided “no.” In summary, the chi-square procedures revealed risk-taking behavior in actuarial low risk conditions and comparatively risk-averse behavior in corresponding SPJ conditions.

Next, the risk perception items were evaluated as a measure. The risk perception items performed poorly across the board. The items were not correlated with each other in any meaningful way, barring a small-to-moderate relationship between items 1 and 6 ($r = -.163$, $p = .032$). This correlation did not have sufficient power. The lack of meaningful correlations among items led to caution regarding data reduction. KMO (.515) and Bartlett's Test of Sphericity ($\chi^2 = 30.310$, $v = 10$, $p < .08$) both indicated data reduction was not appropriate. These results along with internal reliability analysis ($\alpha = .138$) supported dispensing with the risk perception scale as a single measure. Instead, items were entered into correlation analyses individually. Item 1 (live with and calmly deliberate about risk) was moderately correlated with source credibility factor scores. Source credibility of SPJ (factor 1) correlated moderately and negatively with item 1 ($r = -.218$, $p < .004$) implying that when trust, accuracy, and fairness are rated highly, participants were less concerned about risk. Source credibility of actuarial assessment, as measured by fairness, comprehensiveness, and lack of bias, was related to lower concerns about risk ($r = -.216$, $p = .004$). Both correlational analyses have power above .80 and can be evaluated with reasonable certainty. No other correlations were notable. Consequently, risk decisions and risk perception item 1 were included as outcome variable in the full model.

Information Processing

First, data reduction procedures were conducted on the information processing measure. The heuristic and systematic processing items correlated at

moderate levels on average. KMO (.805) and Bartlett's Test of Sphericity ($\chi^2 = 279.999$, $v = 28$, $p < .001$) supported proceeding with the analysis. The large degrees of freedom suggest Bartlett's test may not be the best indicator of sphericity. Results of the factor analysis were interpreted with caution. Exploratory factor analysis revealed two factors (eigenvalues: 2.974 and 1.170) explaining 52% of the variance. The two factors cleaved along the previously defined heuristic and systematic items, with the exception of the first systematic processing item. This item, "I thought about what actions I should take based on what I had read", correlated negatively with the systematic processing items at a moderate level and at a low level with the heuristic processing items. Item one was taken from Johnson (2005) whose EFA procedure detected a strong negative correlation ($r = -.51$, $p < .003$) with the systematic processing items. Consequently, item one was included with heuristic items in further analysis. The third heuristic processing item did not load above .3 on either factor and was subsequently removed. The two factors were significantly correlated ($r = .340$, $p < .001$) after excluding item three. The correlation matrix also revealed patterns of significant relationships among all items, barring item three. An additive index (averaged) of the heuristic items and systematic items was used in further analysis.

The Full Model

The full model was hierarchically regressed on risk judgments. Risk judgments consisted of risk decisions and risk perception item 1 (personal control of risk). Ordering of predictors was based on HSM theory with a few adjustments

to explore the research question of interest. The first three predictors were gender, assessment method, and risk level. The variables were not notably correlated and were entered individually. The next two predictors consisted of the source credibility factor scores ($r = .34$, $p = .001$) and were entered in a set. The fifth set contained the information sufficiency items, correlated moderately ($r = .202$, $p = .007$). Sixth, the accuracy motivation items were entered ($r = .149$, $p = .05$). Accuracy motivation item 1 and information sufficiency item 2 were moderately correlated ($r = -.223$, $p = .003$). The negative relationship between these two variables may suppress the variance accounted for by both sets. The final set consisted of heuristic and systematic processing. Examination of the full models proceeded subsequent to the preliminary analysis (Tables D1 and D2).

Risk decisions as outcome variable was tested first (Table D3). Bonferroni corrections were applied to significance tests ($k = 6$). The first three predictors were not meaningful predictors of risk decisions ($\chi^2 = 6.720$, $p = .481$, Wald = 3.305). Inclusion of source credibility factor scores in the model revealed meaningful prediction of risk decisions ($\chi^2 = 16.693$, $p = .005$, Nagelkerke $R^2 = .124$). The model fit of information sufficiency was meaningful ($\chi^2 = 16.693$, $p = .012$, Nagelkerke $R^2 = .166$) but inclusion of this variable did not add a substantial amount to model fit. Accuracy motivation was responsible for a large jump in prediction ($\chi^2 = 32.155$, $p = .006$, Nagelkerke $R^2 = .229$). Accuracy motivation item 1 had a meaningful inverse relationship with risk decisions ($\beta = .602$, CI = [.412, .880], $p < .054$). The negative valence of the item (importance of the issue) implies that the perception of low importance increases the odds of

risk taking. The full model was an influential predictor of risk decisions ($\chi^2 = 33.970$, Bonferonni $p = .006$, Nagelkerke $R^2 = .24$). The full model increased goodness of fit by a small amount (Nagelkerke $R^2 = .011$). Improvements in the heuristic and systematic processing may improve model fit. Overall, the full model appears to be the best predictor of risk decisions as expected.

The hierarchical model was then evaluated for degree of concern about risk (Table D4). None of the predictive blocks were notable except for block 4: gender, assessment type, risk level, and source credibility factor scores ($F = 3.26$, $p = .048$, $R^2 = .089$). The first four predictors accounted for approximately 9% of the variance in risk decisions, an increase of $R^2 = .055$ over the first three predictors. No other notable changes explained additional variance. The influence of source credibility on degree of concern was established in previous correlation analysis. Regression procedures confirmed the relationship was predictive in nature. The results suggest that, when it comes to concern about risk, source credibility was the most influential predictor in the proposed model.

The preceding results raised an additional question regarding the relationship between source credibility and risk decisions. Specifically, higher source credibility of the SPJ method predicted the low risk condition, but decisions in this condition were risk-averse. A series of regression procedures was run, following up on previous work (Trumbo & McComas, 2003) showing that information processing may explain the relationship between source credibility and risk decisions. Regression of SPJ source credibility on systematic and heuristic processing and these processing modes on risk decisions revealed no

relationships. It seems that information processing does not explain why decisions were comparatively risk-averse in higher credibility, low risk SPJ conditions.

DISCUSSION

Source credibility of risk assessment methods was similar on a superficial level. Beneath the surface, however, there were differences in what kinds of credibility were important for the two methods. Perceived accuracy, trustworthiness, and fairness were important components of SPJ credibility. Comprehensiveness, lack of bias, and fairness were salient to actuarial assessment. In low risk cases, actuarial assessment was more often perceived to have high credibility in comparison to SPJ. Source credibility led directly to risk decisions, with higher credibility resulting in risk-taking decisions. A possible implication of the results is that risk assessment methods may contribute to risk judgments in low risk conditions. If true, experts may need to consider the choice of risk assessment method with this possibility in mind, in addition to other considerations such as training, familiarity, and goal of assessment procedure.

The full model fit prediction of risk decisions to a meaningful degree. The largest increase in fit occurred between the information sufficiency set and accuracy motivation set (Nagelkerke $R^2 = .166$). The fit of both models may have been suppressed due to a moderately significant correlation between perceived personal control (accuracy motivation item 1) and preference for amount of information (information sufficient item 2). Previous work on the model suggests that when motivation is low, risk judgments tend to be liberal (McComas & Trumbo, 2001; Trumbo, 1999; Trumbo & McComas, 2003). In the present study,

accuracy motivation in the form of perceived issue importance predicted risk decisions to a moderately negative degree. The change of model fit and negative valence of accuracy motivation supports the theoretical importance of accuracy motivation as a measure of information sufficiency valence. Specifically, information sufficiency added a substantial amount to the model, and accuracy motivation item 1 provided information about the contribution of desired amount of information and perceived personal control to prediction of risk decisions. In summary, when the issue was deemed less important, risk decisions were more likely to be yes. The results imply that expert witnesses can influence decisions about violence risk by emphasizing importance of the issue and personal control of the risk. For example, an effective way to communicate risk of violence severity or escalation would be to emphasize to decision makers the difficulty inherent in avoiding the risk. This approach would be especially salient in cases where decision makers are less engaged in the decision making process, perhaps due to perceived unimportance of the crime. Of course, this approach would be warranted only when ethically sound, such as when the expert witness perceives that the risk communication message is not effectively being conveyed.

Overall, several implications are postulated as a result of this study. Experts conveying information about risk to decision makers may be able to increase the impact of their reports through a variety of means. First, emphasizing the trustworthiness, accuracy, and fairness of SPJ may improve perceived source credibility in low risk cases. Similarly, actuarial assessment may be perceived as more credible by focusing on fairness, comprehensiveness,

and lack of bias. In turn, risk judgments could potentially be influenced by perceived source credibility of the measures. If the results of this study can be replicated, future research could lead to recommendations for experts on how to best utilize risk assessment methods to communicate risk information.

Limitations and Suggestions for Future Research

As an initial investigation of this model, the university population is an adequate sample. Although the sample provides limited external validity, it is sufficient for preliminary testing a new model of risk perception in the context of violence risk assessment. The model derived from the present study will need to be tested on a variety of different populations to establish its external validity.

The measures of information processing used in this study are reported to have questionable validity in previous research (Trumbo, 2002), particularly the measure of heuristic information processing. The development of multivariate measures for information processing modes could potentially increase validity, improve reliability, and will be a goal for future research on this model. In addition, there are several possible antecedent variables in the HSM that were not tested here, such as level of concern (Trumbo, 1999), task importance (Chaiken & Maheswaren, 1994), and specific attributes of the risk (Trumbo & McComas, 2003). These antecedent variables and others, to be determined through extensive literature review, will be included in future exploration of this model in violence risk contexts.

Future research should examine the model applied to violence risk assessment in forensic mental health professionals. The HSM has been utilized in other legal and moral contexts, providing a good basis of comparison for violence risk assessment research. Rassin and Merckelbach (1999) point out that mental health professionals and triers of fact employ different decision making heuristics in assessments. From their standpoint, clinical professionals tend to interpret information from a more compassionate and supportive standpoint. Future research on the model needs to take into account that risk assessments may be perceived differently within the forensic community, depending on the specific discipline of the professionals utilizing them. Information processing can also vary depending on the clarity of the information presented (Chaiken & Maheswaran, 1994) impacting resultant risk perceptions. In continuation of the work of Kwartner and colleagues (2006) on judicial risk communication preferences, risk communication preferences of potential jurors and forensic professionals should be included in additional work on risk perceptions. Communication formats and preferences may combine to affect choice of information processing strategy and could be considered antecedent variables in future investigation of the HSM.

In conclusion, this study represents the first step at incorporating an existing model of information processing into research on violence risk communication and perception. A great deal of additional research on the model is needed; primary goals will be improvements and adaptations to the current self-report methods of assessing variables of interest and replication of the study

in populations of various forensic disciplines. Continued research on this model could lead to improved expert risk communication aimed at decision makers and other relevant parties.

APPENDICES

Appendix A

Vignette: AA/ Both Risk Conditions

Imagine the following: A 28-year old male has been accepted to Simon Fraser University based on the strength of his academic achievements and potential. In the past, this individual has been convicted of two counts of burglary and one count of physical assault during commission of a burglary. Both crimes were committed without use of weapons. The individual was sentenced to 3 years in prison which he has recently completed. As a newly admitted SFU student, he has applied to live in the residence halls on campus. Due to his previous record, the SFU administration is interested in student opinions about allowing this individual to live in campus residence. A violence risk assessment measure called the Risk of Future Violence Scale (RFVS) was administered to this individual prior to his release from prison. The RFVS assigns weight to each risk factor based on how likely future violence is to occur when that risk factor is present. The results of the RFVS are achieved using statistically-derived predictive relationships between risk factors and future violence. There are a total of 20 items on the RFVS that can be answered either "yes" or "no". Examples of the items are: 1. Are there any previous incidents of violence in the last 5 years? 2. Presence of a substance abuse problem? 3. Has the individual been incarcerated previously? 4. Did the individual have an abusive childhood? 5. Is the individual of below-average intelligence? The answers to these questions are added and the risk of future violence is obtained from a table. The RFVS revealed that this individual has a 50% (10% in low risk condition) chance of

future violence. Based on what you know about this situation, please answer the following questions

Vignette: SPJ/ Both Risk Conditions

Imagine the following: A 28-year old male has been accepted to Simon Fraser University based on the strength of his academic achievements and potential. In the past, this individual has been convicted of two counts of burglary and one count of physical assault during commission of a burglary. Both crimes were committed without use of weapons. The individual was sentenced to 3 years in prison which he has recently completed. As a newly admitted SFU student, he has applied to live in the residence halls on campus. Due to his previous record, the SFU administration is interested in student opinions about allowing this individual to live in campus residence. A violence risk assessment measure called the Structured Assessment of Future Violence Risk (SAFVR) was administered to this individual prior to his release from prison. The SAFVR consists of a series of 20 items associated with violent acts in previous research. The items on the SAFVR can be answered either "yes" or "no". Examples of the 20 items include: 1. Are there any previous incidents of violence in the last 5 years? 2. Presence of a substance abuse problem? 3. Has the individual been incarcerated previously? 4. Did the individual have an abusive childhood? 5. Is the individual of below-average intelligence? These items are completed during the course of a structured interview administered by a professional clinician. The clinician has the ability to record additional risks or protections from risk that may not be included in the 20 SAFVR items. The clinician uses all of the information

obtained during the SAFVR to assign a category of future violence risk (low, medium, or high). The clinician's judgment is that the SAFVR indicates the individual has a medium risk of future violence (or low risk). Based on what you know about this situation, please answer the following questions.

Appendix B

Meyer's Credibility Index (1988)

The results of the assessment are a possible source of information on the issue of (violence risk). Considering what you know, please circle the number between the pair of words that best describes your feelings about information from this assessment.

Can be trusted	1	2	3	4	5	Can't be trusted
Is accurate						Is inaccurate
Is fair						Is unfair
Tells whole story						Doesn't tell story
Is unbiased						Is biased

Accuracy Motivation

Please rate the following, where 0 means “strongly agree” and 5 means “strongly disagree”:

This is an important issue, and it is very important to me to decide how I feel about the violence risk presented by this student.

I find myself trying to decide whether the information I get from the risk assessment measure about this issue is accurate.

Information Sufficiency

Please rate the following where 0 mean "know very little" and 10 means "know a great deal":

How much do you think you know about this person's risk of future violence? :

How much do you feel you need to know about this person's risk for future violence? :

Systematic Processing

Please rate the following on a scale from 1 to 5, where 1 is "strongly agree" and 5 is "strongly disagree".

I thought about what actions I should take based on what I read.

I made connections between the information and what I had heard or read elsewhere.

I thought about how the risk assessment information relates to other things I know.

I tried to relate the information about violence risk to my own life.

I tried to think of the practical applications of the information I got from the violence risk assessment.

Heuristic Processing

Please rate the following on a scale from 1 to 5, where 1 is "strongly agree" and 5 is "strongly disagree":

I skimmed through the information.

I did not spend much time thinking about the information after reading it. :

It takes a lot of mental effort to understand how to use the risk information to make a decision on this issue.

I have difficulty seeing how the information about violence risk relates to the overall decision.

Risk Perception Questionnaire

Please rate the following (3-point semantic differential scales):

Is this the kind of risk that you can learn to live with and calmly deliberate about?

1	2	3
Not true	Somewhat true	Very true

Do you feel that your risk from violence has increased, decreased, or stayed the same?

1	2	3
Increasing	Decreasing	Staying the same

How much control do you think you personally have over avoiding this risk?

1	2	3
No control	Some control	A lot of control

Do you think you have much choice over accepting this risk?

1	2	3
No choice	Some choice	A lot of choice

If you were exposed to violence risk, how aware do you think you would be?

1	2	3
Not aware	Somewhat aware	Very aware

Appendix C

Table C1. Correlations Among Source Credibility Items

1	.461**	.206*	-.040	.148 ^o
2		.092	.153 ^o	.194*
3			.274**	.282**
4				.382**

^o $p < .10$, * $p < .05$, ** $p < .01$.

Table C2. Factor Analysis of Source Credibility of Actuarial Assessment (N = 89)

Items	Factors	
	1	2
1		.879
2		.806
3	.631	
4	.806	
5	.748	
Eigenvalues	1.866	1.250
Percent of Variance (62%)	37%	25%

Note. Principle components analysis, varimax rotation. Loadings blanked at 0.20.

Table C3. Factor Analysis of Source Credibility of SPJ (N = 85)

Items	Factors	
	1	2
1	.789	
2	.772	
3	.736	
4		.820
5		.753
Eigenvalues	1.910	1.228
Percent of Variance (63%)	38%	25%

Note. Principle components analysis, varimax rotation. Loadings blanked at .20.

Appendix D

Table D1. Correlations of Risk Decisions, Source Credibility Average, and Source Credibility Factor Scores (N = 174)

Variables	Risk Decision	Average Source Credibility	Source Cred. Actuarial	Source Cred. SPJ
Risk Decisions		.227**	.235**	.242**
Average Source Credibility			.669**	.797**
Source Cred. Actuarial				.932**

** $p < .01$.

Table D2. Logistic regression of Source Credibility Average and Factor Scores on Risk Decisions

Variable	B	SE B	β
Source Cred. Average	.481	.164	1.617
Source Cred. Actuarial	.481	.159	1.618
Source Cred. SPJ	.545	.175	1.724

Note. All relationships significant at the .01level.

Table D3: Hierarchical Logistic Regression on Risk Decisions.

1	Gender	-.129	.080	-.123	.110
2	Gender	-.123	.080	-.117	.129
	Assess Type	-.079	.077	-.079	.304
3	Gender	-.115	.080	-.110	.151
	Assess Type	-.083	.076	-.083	.276
	Risk Level	.133	.076	.132	.083
4	Gender	-.135	.079	-.128	.088
	Assess Type	-.069	.075	-.069	.356
	Risk Level	.096	.075	.096	.202
	Source Cred. Actuarial	.034	.099	.070	.733
	Source Cred. SPJ	.090	.109	.170	.410
5	Gender	-.134	.078	-.127	.088
	Assess Type	-.033	.075	-.033	.657
	Risk Level	.079	.075	.079	.297
	Source Cred. Actuarial	.025	.098	.053	.796
	Source Cred. SPJ	.089	.108	.167	.414
	Info Sufficiency 1	-.086	.038	-.171	.026
	Info Sufficiency	.058	.039	.115	.143

		2			
6	Gender	-.127	.076	-.120	.099
	Assess Type	-.031	.074	-.031	.672
	Risk Level	.048	.075	.048	.521
	Source Cred. Actuarial	.071	.097	.147	.466
	Source Cred. SPJ	.052	.107	.098	.627
	Info Sufficiency 1	-.067	.038	-.135	.078
	Info Sufficiency 2	.033	.039	.066	.399
	Accuracy Motivation 1	-.103	.038	-.206	.008
	Accuracy Motivation 2	-.037	.037	-.073	.323
7	Gender	-.103	.079	-.098	.194
	Assess Type	-.032	.075	-.032	.674
	Risk Level	.044	.075	.044	.558
	Source Cred. Actuarial	.063	.097	.132	.517
	Source Cred. SPJ	.064	.107	.121	.549
	Info Sufficiency 1	-.068	.038	-.136	.077
	Info Sufficiency 2	.026	.040	.052	.517
	Accuracy	-.107	.039	-.214	.006

Motivation 1				
Accuracy Motivation 2	-.040	.038	-.080	.285
Heuristic Processing	.049	.040	.098	.225
Systematic Processing	.006	.040	.012	.881

Table D4: Hierarchical Regression on Risk Perception (Item 1, Perceived Control)

1	Gender	.193	.159	.093	.226
2	Gender	.209	.159	.101	.189
	Assess Type	-.214	.151	-.109	.158
3	Gender	.196	.158	.095	.216
	Assess Type	-.206	.150	-.105	.172
	Risk Level	-.231	.150	-.117	.127
4	Gender	.234	.155	.113	.133
	Assess Type	-.234	.147	-.119	.113
	Risk Level	-.160	.149	-.081	.284
	Source Credibility Actuarial	-.073	.195	-.077	.710

5	Source Credibility SPJ	-.172	.216	-.164	.427
	Gender	.229	.156	.110	.145
	Assess Type	-.271	.150	-.137	.074
	Risk Level	-.137	.150	-.069	.364
	Source Credibility Actuarial	-.065	.196	-.069	.739
	Source Credibility SPJ	-.167	.217	-.159	.443
	Info Sufficiency 1	.077	.077	.078	.319
	Info Sufficiency 2	-.076	.078	-.077	.331
6	Gender	.227	.157	.110	.150
	Assess Type	-.264	.152	-.134	.085
	Risk Level	-.136	.153	-.069	.378
	Source Credibility Actuarial	-.075	.199	-.079	.708
	Source Credibility SPJ	-.158	.219	-.151	.471
	Info Sufficiency 1	.070	.078	.071	.373
	Info Sufficiency 2	-.066	.081	-.067	.416

7	Accuracy Motivation 1	.039	.079	.039	.623
	Accuracy Motivation 2	-.019	.077	-.019	.803
	Gender	.243	.163	.117	.138
	Assess Type	-.266	.155	-.135	.087
	Risk Level	-.139	.154	-.070	.370
	Source Credibility Actuarial	-.082	.201	-.087	.683
	Source Credibility SPJ	-.148	.222	-.141	.507
	Info Sufficiency 1	.070	.079	.071	.376
	Info Sufficiency 2	-.072	.083	-.073	.382
	Accuracy Motivation 1	.035	.080	.035	.667
	Accuracy Motivation 2	-.021	.078	-.021	.784
	Heuristic Processing	.040	.083	.041	.629
	Systematic Processing	.014	.082	.014	.864

REFERENCES

- Bentler, P. M. (2006). EQS 6 Structural Equations Program Manual. Encino, CA: Multivariate Software, Inc.
- Bentler, P. M. & Wu, E. J. C. (2002). *EQS 6 for Windows User's Guide*. Encino, CA: Multivariate Software, Inc.
- Chaiken, S. (1980). Heuristic versus systematic processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, 39, 752-766.
- Chaiken, S., Giner-Sorolla, R., & Chen, S. (1996). Beyond accuracy: Defense and impression motives in heuristic and systematic information processing. In P. M. Gollwitzer & J. A. Bargh (Eds). *The psychology of action: linking cognition and motivation to behavior* (pp. 553-578). New York: Guilford.
- Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman and J. A. Bargh (Eds.), *Unintended thought* (pp. 212-252), New York: Guilford.
- Chaiken, S. & Maheswaran, D. (1994). Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of Personality and Social Psychology*, 66, 460-473.

- Cohen, J. (1990). Things I have learned so far. *American Psychologist*, 45, 1304-1312.
- Cohen, J., Cohen, P., West, S.G., Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioural sciences* (3rd ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Cook, R. D. (1998). *Regression graphics: ideas for studying regressions through graphics*. New York: John Wiley & Sons, Inc.
- Douglas, K. S. & Ogloff, J. P. R. (2003). The impact of confidence on the accuracy of structured professional and actuarial violence risk judgments in a sample of forensic psychiatric patients. *Law and Human Behavior*, 27, 573-587.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes* (pp.305-349). New York: Harcourt Brace Jovanovich.
- Edens, J. F., Buffington-Vollum, J. K., Keilen, A., Roskamp, P., & Anthony, C. (2005). Predictions of future dangerousness in capital murder trials: Is it time to "Disinvent the Wheel?". *Law and Human Behavior*, 29, 55-86.
- Epstein, S. (1994). Integration of the cognitive and psychodynamic unconscious. *American Psychologist*, 49, 709-724.

- Epstein, S. & Pacini, R. (1999). Some basic issues regarding dual-process theories from the perspective of cognitive-experiential self-theory. In S. Chaiken, & Y. Trope (Eds.), *Dual process theories in social psychology* (pp. 462-483). New York: Guilford.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S. & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes toward technological risks and benefits. *Policy Sciences*, 9, 127-152.
- Freudenburg, W. R., & Rursch, J. A. (1994). The risks of "Putting the Numbers in Context": A cautionary tale. *Risk Analysis*, 14, 949-958.
- Gigerenzer, G. (1994). Why the distinction between single-event probabilities and frequencies is relevant for psychology and vice versa. In G. Wright & P. Ayton (Eds.), *Subjective probability* (pp. 129-162). New York: Wiley.
- Griffin, R. J., Dunwoody, S., & Neuwirth, K. (1999). Proposed model of the relationship of risk information seeking and processing to the development of preventative behaviors. *Environmental Research*, 80, 230-245.
- Grove, W. M. & Meehl, P. E. (1996). Comparative efficiency of informal (subjective, impressionistic) and formal (mechanical, algorithmic) prediction procedures: The clinical-statistical controversy. *Psychology, Public Policy, and Law*, 2, 293-323.
- Guy, L. S. & Edens, J. F. (2003). Juror decision-making in a mock sexually violent predator trial: Gender differences in the impact of divergent types of expert testimony. *Behavioral Sciences and the Law*, 21, 215-237.

- Hart, S. D. (2001). Assessing and managing violence risk. In K. Douglas, C. Webster, S. Hart, D. Eaves, and J. Ogloff (Eds.), *HCR-20 violence risk management companion guide* (pp.13-25). Burnaby, British Columbia, Canada: Mental Health, Law, and Policy Institute, Simon Fraser University and Department of Mental Health, Law, and Policy, Florida Mental Health Institute, University of South Florida.
- Hart, S. D., Kropp, P. R., Laws, D. R., Klaver, J., Logan, C., & Watt, K.A. (2003). *The Risk for Sexual Violence Protocol (RSVP)*. Burnaby, BC: Simon Fraser University, Mental Health, Law, and Policy Institute.
- Heilbrun, K., Douglas, K., & Yasuhara, K. (under revision). Chapter to appear in Skeem, J., Douglas, K., & Lillienfeld, S. (Eds.). *Psychological Science in the Courtroom: Controversies and Consensus*. New York, Guilford.
- Heilbrun, K., Dvoskin, J., Hart, S., and McNeil, D. (1999). Violence risk communication: Implications for research, policy, and practice. *Health, Risk, and Society, 1*, 91-106.
- Johnson, B. B. (2005). Testing and expanding a model of cognitive processing of risk information. *Risk Analysis, 25*, 631-650.
- Hovland, C. I., & Wiess, W. (Winter, 1951-1952). The influence of source credibility on communication effectiveness. *The Public Opinion Quarterly, 15*, 635-650.

- Krauss, D. A. & Lee, D. H. (2003). Deliberating on dangerousness and death: jurors' ability to differentiate between expert actuarial and clinical predictions of dangerousness. *International Journal of Law and Psychiatry*, 26, 113-137.
- Krauss, D. A., Lieberman, J. D., & Olson, J. (2004). The effects of rational and experiential information processing of expert testimony in death penalty cases. *Behavioral Sciences and the Law*, 22, 801-822.
- Krauss, D. A. & Sales, B. D. (2001). The effects of clinical and scientific expert testimony on juror decision making in capital sentencing. *Psychology, Public Policy, and Law*, 7, 267-310.
- Kropp, R. P. & Hart, S. D. (1997). Assessing risk of violence in wife assaulters: The Spousal Assault Risk Assessment Guide. In C. D. Webster & M. A. Jackson (Eds.), *Impulsivity: theory, assessment, and treatment* (pp. 302-325). New York, NY: Guilford Press.
- Kwartner, P. P., Lyons Jr., P. M., & Boccaccini, M. T. (2006). Judges' risk communication preferences in risk for future violence cases. *International Journal of Forensic Mental Health*, 5, 185-194.
- Lanyon, R. I. & Carle, A. C. (2007). Internal and external validity of scores on the Balanced Inventory of Desirable Responding and the Paulhus Deception Scales. *Educational and Psychological Measurement*, 67, 859-876.

- McComas, K. A. & Trumbo, C. W. (2001). Source credibility in environmental health-risk controversies: application of Meyer's Credibility Index. *Risk Analysis*, 21, 467-480.
- McNiel, D. E., Sandberg, D. A., & Binder, R. L. (1998). The relationship between confidence and accuracy in clinical assessment of psychiatric patients' potential for violence. *Law and Human Behavior*, 22, 655-669.
- Meyer, P. (1988). Defining and measuring credibility of newspapers: Developing an Index. *Journalism Quarterly*, 65, 567-588.
- Mullet, E., Duquesnoy, C., Raiff, P., Fahrasmane, R., & Namur, E. (1993). The evaluative factor of risk perception. *Journal of Applied Social Psychology*, 23, 1594-1605.
- Neuwirth, K., Frederick, E., & Mayo, C. (2002). Person-effects and heuristic-systematic processing. *Communication Research*, 29, 320-361.
- Paulhus, D. L. (1988). Assessing self deception and impression management in self-reports: the Balanced Inventory of Desirable Responding. Vancouver, BC: University of British Columbia.
- Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P.R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp.17-60). San Diego: Academic Press, Inc.

- Peters, R. G., Covello, V. T., & McCallum, D. B. (1997). The determinants of trust and credibility in environmental risk communication: An experimental study. *Risk Analysis*, *17*, 43-54.
- Pittinger, C. A., Brennan, T. H., & Badger, D. A. (2003). Aligning chemical assessment tools across the hazard-risk continuum. *Risk Analysis*, *23*, 529-535.
- Rassin, E. & Merckelbach, H. (1999). The potential conflict between clinical and judicial decision making heuristics. *Behavioral Sciences and the Law*, *17*, 237-248.
- Rice, M. (1997). Violent offender research implications for the criminal justice system. *American Psychologist*, *52*, 414-423.
- Rice, M., & Harris, G. (1995). Violent recidivism: Assessing predictive validity. *Journal of Consulting and Clinical Psychology*, *63*, 737-748.
- Siegrist, M., & Cvetkovich, G. (2001). Better negative than positive? Evidence of a bias for negative information about possible health dangers. *Risk Analysis*, *21*, 199-206.
- Slovic, P., Fischhoff, B., & Lichtenstein, S. (1985). Characterizing perceived risk. In R. W. Kates, D. Hohenemser, & J. Kaspersen (Eds.). *Perilous progress: technology as hazard* (pp. 91-123). Boulder, CO: Westview.

- Slovic, P., Monahan, J., & MacGregor, D. G. (2000). Violence risk assessment and risk communication: the effects of using actual cases, providing instruction, and employing probability versus frequency formats. *Law and Human Behavior, 24*, 271-296.
- Trumbo, C. W. (1996). Examining psychometrics and polarization in a single-risk case study. *Risk Analysis, 16*(3), 423-432.
- Trumbo, C. W. (1999). Heuristic-systematic information processing and risk judgment. *Risk Analysis, 19*, 391-400.
- Trumbo, C. W. (2002). Information processing and risk perception: An adaptation of the heuristic-systematic model. *Journal of Communication, 52*, 367-382.
- Trumbo, C. W., & McComas, K. A. (2003). The function of credibility in information processing for risk perception. *Risk Analysis, 23*, 343-353.
- Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *HCR-20. Assessing risk for violence* (Version 2). Burnaby, British Columbia, Canada: Mental Health, Law and Policy Institute, Simon Fraser University.