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## An Empirical Test of Social Information Processing Theory and Emotions in Violent Situations

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**Abstract:** *Criminological research has favored the rational choice perspective in studying offender decision making. However, this theoretical approach does not take into account the complex interplay of situational, cognitive, emotional, and person factors that likely influence criminal decision making. To that end, the current study examines decision making in high-risk-for-violence situations focusing on social information processing and emotional state variables. The current study utilizes a sample of 236 newly incarcerated jailed inmates who provide personal level data and situational reports of violent and avoided violence situations (n=466). Hierarchical generalized linear modeling (HGLM) is applied to analyze the data and the findings show that several situational, social information processing, and emotion variables, such as intent interpretation, goal, and response generation, are significant predictors of the escalation of violence.*

**Keywords:** decision making, emotions, situation, social information processing theory, theory, violence

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### INTRODUCTION

In recent years, there has been a renewed interest in studying the situational components of crime (e.g., Horney 2006). Often grounded in symbolic interaction (Mead 1934), researchers from this perspective focus on a wide variety of situational (e.g., substance use, presence of bystanders, weapons), and personal factors (e.g., demographics), that influence situational outcomes (Birkbeck and LaFree 1993; Horney 2006; Sampson and Lauritsen 1994). This perspective has merit in that it allows researchers to examine traditional individual-level (or person-level) factors, while also examining how people interact with, and are influenced by, their current

environment. Despite this interest, there has been a dearth of research regarding decision-making processes in these situations. Some researchers, in attempting to understand the escalation of violence, have argued that there is a cognitive stage where offenders interpret situational cues and/or decide on a course of action to pursue in that situation (e.g., Felson and Steadman 1983; Oliver 1994). However, to date, these stages have not received much empirical exploration.

Traditionally, individual-level explanations for offending and decision-making in criminology have focused on the rational choice perspective. However, this perspective is challenged for being overly simplistic and: failing to account for (1) the complexity of decision

making, (2) the role of high emotionality, and (3) environmental influences (Boudon 1998; De Haan and Vos 2003). For example, De Haan and Vos (2003) suggest that the rational choice perspective is too narrow. They also argue that individuals' actions are not the sole product of intention, but rather a social process outcome of complex decision making. Secondly, De Haan and Vos (2003) suggest that the rational choice perspective does not clarify the offenders' experiences before (or during) the offenses are committed. When this is neglected, opportunities to explain motive and thought processes are diminished. Rational choice assumes motivation but does not account for motivation (Jacobs and Wright 1999).

Objective assessments of situations are difficult when rationality is bounded (Walsh 1986), when it simply does not exist (Jacobs and Wright 1999), or when it is compounded by emotions. Copious and objective responses may not be available due to the limited capabilities of individuals (Johnson and Payne 1986). Offenders' alternatives or choices are subjective; therefore, a rational, objective assessment of possible alternatives to committing a crime may not exist.

Within this literature it has been a major obstacle to empirically identify decision making on an individual level since the underlying cognitive processes are not readily observable (Glockner and Betsch 2008). Despite this, researchers in psychology have attempted to articulate this process through decision-making theories of aggression, deviance, and criminal behavior.

One such attempt is Crick and Dodge's (1994) reformulated social information processing (SIP) theory. The theory is a social cognitive approach based on the assumption that people "come to a social situation with a set of biologically limited capabilities and a database of memories of past experiences" (Crick and Dodge 1994: 76). This model was further updated by Lemerise and Arsenio (2000) to account for the role emotions play in decision making. This theory (and we argue, the update) articulates the steps individuals take to arrive at a judgment (Ybarra 2002) and is, therefore, useful in understanding offender decision making during violent encounters.

Thus, the purpose of this paper is to assess the utility of social information processing and emotion for understanding offender decision making in a sample of 236 newly incarcerated inmates in multiple facilities. Specifically, we asked these respondents to recall violent and avoided violence situations that they participated in, up to 24 months prior to incarceration.

## **SOCIAL INFORMATION PROCESSING THEORY**

Social information processing (SIP) theory is broadly concerned with the mental processes used by individuals to create a behavioral response during social interactions (Crick and Dodge 1994). The theory suggests that all

individuals go through six sequential processing steps, which are relatively independent of each other, during their processing of a social situation, to arrive at a decision. These steps include: (1) attention to social cues, characteristics of intent, goal generation, accessing scripts of past behavior from memory, (2) decision making, and (3) enacting the decision through behavioral responses (Dodge and Rabiner 2004; Zelli et al. 1999). Adding to the complexity of this decision-making process is that emotions are hypothesized to occur with each sequential step and, therefore, play a vital role in each decision (Crick and Dodge 1994; Dodge 1991; Dodge and Rabiner 2004). However, the theory does not articulate the specific role that emotions play (see Crick and Dodge 1994). Lemerise and Arsenio (2000) offer a model that combines the cognitive components of Crick and Dodge's model with emotional processes deemed important in decision making. In discussing the theory, we include aspects from each.

Specifically, the first step in social information processing theory is the encoding of cues in a situation. These cues are both internal and external (Crick and Dodge 1994), where internal cues are those the person brings with them into the situation, while external cues are taken from the immediate situation (Lansford et al. 2006). For example, any prior knowledge or within person trait variables, like biases to certain behaviors, constitute internal cues. Any new cue is an external cue and could include non-verbal, affective or verbal communication with another person from the immediate situational context.

The second step, interpretation, is a complex stage whereby the person interprets the current situational cues in light of information stored in their individual "database" of memories. The database contains earlier experiences that are stored in the form of associations, schemata, scripts, and social knowledge (Crick and Dodge 1994; De Castro 2004). During this second step, the motive/intent of others' behaviors is interpreted (Lansford et al. 2006). This interpretational process may result in changes or revisions to the individual's database (Crick and Dodge 1994).

Past researchers have examined the intent attributions of others and have found that aggressive youth, in ambiguous situations, are more likely to attribute hostile intentions to others in the situation (De Castro et al. 2002; Fontaine et al. 2010; Halligan et al. 2007). This has been coined hostile attribution bias (Dodge 1980). Hostile attribution bias is particularly salient in *reactive aggression* (as opposed to proactive aggression) where the individual misinterprets the social cues of others thus becoming frustrated, angry, and aggressive (see for example, Arsenio, Adams, and Gold 2009; Arsenio and Lemerise 2004). Further, Coccaro, Noblett, and McCloskey (2009) assessed attributional and emotional responses to socially ambiguous situations and found that hostile attribution had a significant relationship with an individual's emotional response to provocation.

Specifically, hostile attribution bias was associated with the inability of an individual to regulate and express emotions. Additionally, negative emotions, such as anger, have been positively correlated with aggressive behavior and with the inability to solve problems (Chen, Coccaro, and Jacobson 2012), and have also been found to be associated with hostile attribution bias and aggressive behavior (Arsenio and Lemerise 2004; De Castro 2004).

The third step in social information processing theory is the clarification of goals in a situation: "Goals are focused arousal states which function as orientations toward producing (or wanting to produce) particular outcomes" (Crick and Dodge 1994: 76). Individuals bring goals to a social situation, but they can revise or construct new goals in response to immediate social stimuli. Goals can be categorized as intrapersonal or interpersonal. Intrapersonal, or instrumental, goals are self-serving and promote individual gains (Crick and Dodge 1994; Lansford et al. 2006; Losel, Bliesener, and Bender 2007). These intrapersonal goals tend to be more egocentric and antisocial, whereas, interpersonal goals pertain to "between person gains" that promote dealing with, and thinking about, others. *Proactive aggression* (in contrast to reactive aggression) is marked by a preference for intrapersonal/instrumental goals and viewed as a means to attain valuable goals or items (Arsenio, Adams, and Gold 2009; Arsenio and Lemerise 2004; Dodge, Coie, and Lynam 2006).

More/less positive goals can be formed based on emotional processes. For example, the prior relationship with the other(s) present can impact goal formation (Lemerise and Arsenio 2000). Individuals may consider less harmful goals in tense situations involving a close friend or family member in an effort to preserve that relationship. However, individuals who are proactively aggressive may favor intrapersonal/instrumental goals over relational ones (Arsenio et al. 2009). Further, the emotional states of others involved in the situation can influence goal formation. If the opponent is perceived as being angry, for example, this may negatively influence the goal selected.

During step four, individuals access plausible responses from memory, or construct new behaviors, in response to the immediate social situation. During step five, the response decision, an individual evaluates the previous responses (which can be accessed from memory or newly constructed), and selects the one most positively evaluated to enact during the situation. This decision can be made based on a number of factors, including: (a) the expected outcomes based on past experiences, (b) individual self-efficacy, and (c) an evaluation of the appropriateness of the response (response evaluation). Lemerise and Arsenio (2000) suggest that negative emotions (like anger) can facilitate hostile attribution bias, especially for individuals who are reactively aggressive, and make it difficult for effective response generation or

evaluation to occur. The sixth, and last, step is the enactment of such response through a given behavior (Crick and Dodge 1994). Individuals initiate the behavior that seems most appropriate to obtain their goal in the situation (Losel et al. 2007).

### Empirical Support

SIP theory suggests that deficits in one or more of the steps can result in socially unacceptable behavior, including aggression and violence, in a situation (Losel et al. 2007). Research has shown that aggressive children exhibit these processing deficiencies across a variety of situations. Several longitudinal studies have also confirmed that patterns of deviant processing lead to aggressive responses (Zelli et al. 1999). However, the majority of longitudinal and cross-sectional research on social information processing theory has been focused on children and adolescents (see Crick and Dodge 1996; Crozier et al. 2008; Losel, et al. 2007; Quiggle et al. 1992; Shahinfar, Kupersmidt, and Matz 2001; Zelli et al. 1999). To date, SIP has been effective in accounting for child and adolescent aggression (e.g., Dodge et al. 1995; Fontaine, Burks, and Dodge 2002).

While most SIP studies have focused on children, there have been a few studies testing social information processing and violence/aggression with older adolescent samples. For example, Crozier et al. (2008) investigated 585 adolescents over a three year period, from ages 16 to 18. This was the first study to examine the relationship between processing patterns and antisocial behavior in a group of later adolescents. Using mail questionnaires and videotaped vignettes, the researchers found that deviant social information processing predicted antisocial behavior and proactive aggression. The study also found that social information processing variables significantly predicted future antisocial behavior, even when controlling for past behavior(s).

Further, Losel and colleagues (2007) prospectively studied 102 adolescent boys in seventh and eighth grade, and again in ninth and tenth grade. Using vignettes to measure the steps of SIP, the vignettes presented respondents with conflicts that could trigger more or less aggressive-prone cognitive schemata. The researchers found SIP variables explained approximately 20 to 34 percent of individual differences in aggression after 20 months. Likewise, in one of the largest studies to date, a 12-year prospective study was conducted by Lansford et al. (2006) to assess social information processing on a community sample of 576 children in kindergarten, with follow-up assessments in grades 3, 8, and 11. Using video vignettes to assess social information processing of the respondents at each wave, the researchers found that SIP problems in eighth grade predicted externalizing behaviors (which included measures of delinquency and aggression) in 11<sup>th</sup> grade.

Similar to aggressive children and adolescents, adults who have committed violent crime have expressed deviant interpretations (i.e., hostile intentions) of ambiguous social situations. Topalli (2005) conducted a quasi-experiment using videotaped Point Light Displays (PLD) to compare the extent to which offenders and non-offenders perceive situations differently. PLD videos have actors in darkened areas, use point-light sources (typically reflective tape or light bulbs) on joints, and perform ambiguous actions which leave viewers to interpret the situations taking place.

The study was composed of three groups: (1) known offenders, (2) a comparison group of individuals matched on demographics of the offender group, and (3) college students. Known offenders perceived the PLD's to be more aggressive than did college students and the comparison group. The offender group and the comparison group however, similarly perceived crimes taking place in the ambiguous PLD's at 72 percent and 69 percent of the time compared to college students perceiving a crime taking place 12 percent of the time.

This study was significant because it highlighted the importance of social cognitive decision making in offenders, in particular, how different individuals interpret the intentions of others. However, it did not detail the process of decision making nor did it ask offenders to relate their decision making to crimes.

The studies reviewed so far used vignettes, or standard scenarios of some form, to measure social information processing. Although vignettes or scenarios are often used as a standard for measuring social information processing and provide important information, self-report can offer different insights into offender decision making. Using vignettes, the respondent has to "pretend" he is part of a situation and then predict his or her behavioral outcome. While this approach allows researchers to examine how individuals interpret/respond to a wide array of novel situations, some individuals may not be able to relate to the vignettes, and the vignettes cannot adequately portray the wide range of situational and emotional cues that accost a person in any given situation (e.g., presence of bystanders, substance use, and weaponry).

A different and more direct way to measure social information processing, is to ask respondents to describe recent aggressive situations in which they were involved followed by questions about the situational context and their decision making.

Importantly, the lack of SIP studies using adult samples is also problematic. Developmentally, as individuals' age their experiences with different social situations increase, as does their social knowledge (Crick and Dodge 1994). There has not been a study, to date, that has tested SIP in adult offenders, specifically focused on aggressive and violent situations. Studies utilizing adult and criminal samples are needed to examine these issues, as well as the importance of the theory in explaining aggressive and criminal behavior.

## THE CURRENT STUDY

In the current study, the researchers analyze 466 violent and avoided violence situations described by newly jailed offenders in order to assess decision making in these situations.

Here we advance the study of decision making through a within-person analysis that takes into account emotions and cognition, in order to examine whether there are variations in individuals' decision-making processes, using social information processing theory (SIP), affect situational outcomes.

### Test of Hypotheses

Our hypotheses examine the differences in decision making, using social information processing theory. Specifically, we expect situations where respondents report poor or ineffective SIP to be more likely to end in violence as opposed to avoid violence. We hypothesize that in violent situations (compared to avoided situations), respondents attribute more negative intentions to the opponent(s) at the second step of processing (interpretation of cues), select more intrapersonal goals (compared to interpersonal goals) at step three, generate fewer behavioral responses at step four, and admit that their action got them what they wanted in the situation. Building on Lemerise and Arsenio's (2000) study, we also hypothesize that emotions play a role in these situations, in terms of anger and hostile attribution bias, at the situational level. Specifically, the more anger and hostile attribution bias in a situation, the more likely the situation will result in a violent outcome.

Finally, with the addition of situational variables, the social information processing and emotion variables will not be as significant as in the previous models. Previous research suggests that situational variables such as substance use and weaponry, can be significant predictors of violence (see Boles and Miotto 2003; Chambers et al. 2009; Felson, Burchfield, and Teasdale 2007; Graham, West, and Wells 2000; Krienert and Vandiver 2009; Phillips and Maume 2007; Wells and Horney 2002). However, the extent to which SIP, emotion, and situational variables interact is unknown due to the lack of previous research that examines all variables in one study.

## METHODOLOGY

### Sample and Procedures

The sampling frame for the current study includes 330 newly incarcerated males, age 18 and older, located in four county jail facilities in Western Pennsylvania. A total of 236 of these inmates participated in the interviews regarding violent and avoided violence situations. As the literature review indicates, prior research on social information processing theory has focused on adolescents.

Less is known about adults' social information processing in relation to violent behavior.

For this study, newly incarcerated offenders include all male offenders, regardless of committing offense, who are housed in jails for three months or less. Sampling newly incarcerated inmates is largely grounded in prior literature that shows it is ideal to ask individuals about their past behaviors in a timely manner for the best recall (see Bradburn, Rips, and Shevell 1987; Wells and Horney 2002).

While the researchers originally intended to interview all available inmates who met the sampling criterion, due to security purposes, only one jail allowed the researchers to engage with inmates. A second jail gave the researchers a list containing the sampling frame of potential respondents, and made all of these inmates available for the interviews. These approaches led to a 90.82 percent and 94.73 percent response rate respectively. In the remaining jails, the researchers were not privy to the list of potential respondents. If an inmate was called by a correctional officer but decided not to meet with the researchers, then the researchers were not privileged to this information and, thereby could not count these individuals who declined to participate, as respondents. Of those who met with the researchers at these two facilities, 92.92 percent participated in the study. Overall, in all four facilities, the study had a 93 percent response rate (236 respondents). This is similar to previous studies that also report a high degree of participation in institutionalized settings (ONDCP 2011; Wells and Horney 2002).

As past research has shown, offenders participate in multiple offense types (see, for example, Bennett and Brookman 2008; Brookman et al. 2007; Jacobs, Topalli, and Wright 2000; Jacobs and Wright 2008; Pizarro 2008; Topalli, Wright, and Fornango 2002). For this study, inmates were invited to participate, regardless of their committing offense. While inmates are not representative of the overall population, they offer valuable insight into the study of violence. For example, offenders are likely to have numerous experiences with violence compared to the general population (Horney 2001), both as victims and offenders (see, for example Sampson and Lauritsen 1990, 1994; Wells and Horney 2002). Because of this exposure, offenders can be studied in order to gain a better understanding of decision making, emotions, and contextual factors present in high-risk-for-violence situations.

In the present study, two researchers conducted all of the interviews from June to October 2010. The average interview took approximately one hour to complete. In three of the jails, the interviews were conducted in separate, private rooms, with only the interviewer and respondent present. In the fourth and largest jail, the interviews were conducted in one large room designated for attorneys and clients to meet. The attorney client room had approximately eight tables laid out against the walls of

the room. In this room, both interviewers were conducting interviews with different respondents, while attorneys (at times) were also meeting with clients. However, the layout of the room optimized the privacy of each respondent. Additionally, correctional officers remained outside of the attorney-client room providing further privacy.

The survey was computerized and the interviewers recorded the respondent's answers directly into an Excel program. Interviewers sat next to the inmates, pointing out different things on the screen in order to eliminate any suspicion by the inmates about what was being recorded (Wells and Horney 2002). All respondents provided informed consent and voluntarily agreed to participate.

The interviewers asked each respondent to report multiple situations, both violent and avoided violence (defined below), in which they had been involved in the 24 month period before the arrest that brought them to jail. Each individual was asked to report up to three situations for each category, for a possible analysis of six situations per respondent. If a respondent had more than three of either of these situations, then he was asked to report the three most recent situations. We utilized a life events calendar to aid the respondents recall. The cueing used with life events calendars helps respondents remember general events in the specific time frame, which then serve as cues for more specific events. In addition to the situation reports of the specific violent and avoided violence situations, the interviewers also collected important individual level information (e.g., trait level hostile attribution bias and anger). Thus, these data are nested (situations nested in person).

## **Key Variables**

### **Dependent variable**

In this study, we examine how social information processing, emotions, and other individual and situational variables influence the escalation of violence. In order to do so, we collected data from respondents about violent and avoided violence situations. This approach has been recommended (see for example, Sampson and Lauritsen 1994) and used by a number of researchers in the past (see, for example, Felson 1996; Horney 2001; Short 1998). A violent situation is defined as a physical confrontation by a person upon another person for the purpose of inflicting bodily harm to that person. Violent situations include use of a weapon, hitting, punching, slapping, kicking, choking, or throwing something at someone. Avoided violence situations are similar situations in that the respondent perceived there was a high risk of violence but, for whatever reason, violence did not occur. Avoided violence might include situations where the respondent grabbed, pushed, or threatened someone; where someone encouraged the respondent to become involved in violence, but he did not; or situations where the respondent was so angry he could have hurt someone but did not. The

violent and avoided violence definitions were taken, with permission, from Horney's (2001) study. The line between these two situations is drawn to discern between more and less serious acts of violence. While being grabbed or pushed could certainly be regarded as violent, the researchers wanted to have a sampling of situations that varied on the severity of the gravity of violence used. Thus, this distinction was made. Respondents were given definitions and examples of each type of situation and then were asked to report whether or not they had been involved in any of these types of situations. If they had been involved, the interviewers collected specific situation reports for up to three of each type of incident. The dependent variable is dichotomous with avoided violence coded as 0 and violence as 1.

### **Independent variables**

The primary independent variables assessed in this study were measures of social information processing theory (SIP) that were used to tap into the decision making of respondents. While social information processing theory suggests that people go through six cognitive processes to enact a behavioral response, only four of the six steps were measured quantitatively in the present study. Due to measurement difficulties, the other steps were measured at the descriptive level. Thus, this is a partial test of SIP. The SIP measures used here have been taken from prior literature on social information processing theory (see Arsenio and Lemerise 2004; Losel et al. 2007) and extended by the researchers.

The first SIP item measures step two of the theory, which is the respondent's interpretation of social cues of the opponent(s) in the violent or avoided violence situation. As indicated in prior research, SIP asserts that people (especially those who are reactively aggressive) are more apt to act aggressively if they perceive the opponent's intent to be negative. The survey item asked the respondent to indicate what he perceived the opponent's intent to be in the situation ("How positive or negative was the opponent's intent?"). This "Intent Interpretation" variable is measured on an 11 point scale from zero to ten, with zero indicating the opponent's intent was negative, five indicating neutral, and ten indicating positive. A second measure of stage two is collected for descriptive purposes, and asks the respondent to identify how he knew the opponent's intentions. The "Encoding of Cues" variable's response choices are: past experiences with the opponent(s), past experiences with others, you just knew, the opponent(s) told you, the opponent(s) behavior, or other. The next SIP item measures step three of the theory, or the goal (referred to in the models as Goal) of the respondent in the situation. The goal refers to what the respondent wanted to get out of the situation. This question was open-ended to allow the respondent to list any goal(s) they had in the situation (e.g., "What did you

want to achieve in this situation?"). Based on the goal(s), responses were categorized into two response choices: intrapersonal (0) or interpersonal (1). SIP literature suggests that individuals (especially those who are proactively aggressive) are more likely to enact a violent behavioral response if they pick goals that are more intrapersonal or self-serving and promote individual gain.

The next SIP item measures step four of the theory, which concerns the respondent's response generation. The theory suggests that people who act more violently are less likely to think of alternate ways to deal with situations. The item representing the "Response Generation" variable asks the respondents if they thought of any other ways to deal with the situation ("At that time, did you think of other ways to deal with the situation?" 1=yes/ 0=no). Although there were follow-up questions asked to determine what these response generations were and if the respondent thought the response generations would get them what they wanted, these are not included in the statistical analysis but are instead, included in the descriptive statistics below. The last SIP item measures step six of the theory (behavioral enactment of the decision) and asks the respondent if his behavior got him what he wanted in the situation ("Did (action) get you what you wanted in this situation?" 1=yes/0=no). This variable is referred to as "Action Benefit". This question relates back to the goal clarification step. The theory asserts that individuals enact the behavioral response they feel will get them the goal(s) they want to achieve in the situation.

Hostile attribution bias is measured at both the trait (i.e., individual) and state (i.e., situational) level. Hostile attribution, at the trait level, is the respondent negatively evaluating other individuals' emotions toward the respondent across situations and time. At the situational level, it is defined as the respondent negatively evaluating other individuals' emotions toward the respondent in a given situation (Topalli and O'Neal 2003). Two scales, the Trait Hostile Attribution Bias and State Hostile Attribution Bias Scales, were used. Topalli and O'Neal originally utilized the state scale in their study on provocation and retaliatory motivation. For the purposes of this study, we maintain the original scale for the State HAB measure, and we changed the wording slightly in order to create the Trait HAB scale. Trait and state hostile attribution bias were each measured using a six-item scale. These questions for both scales were all answered on a five point Likert scale of "Strongly Disagree (1)" to "Strongly Agree (5)." The score range for both scales is 6 to 30, with higher scores representing more hostile attribution bias. For the trait scale items, the respondent was asked to report how he perceives most people feel about him most of the time. Examples include, "Most people are angry with you" and "Most people are hostile with you." The internal validity of the Trait HAB scale is very good with a Cronbach's alpha of .81. For the state scale items, the respondents

reported how they perceived the opponent(s) felt during the situation. Examples include, “The opponent(s) was angry with you” and “The opponent(s) was hostile towards you.” The State HAB scale has a Cronbach’s alpha of .89.

To test Lemerise and Arsenio’s (2000) proposed model of integrating emotional processes into Crick and Dodge’s (1994) social information processing theory, this study utilizes additional independent variables in Model 2 (presented in Table 3 below). To measure differences in emotional processes at the trait or individual level, we focus on trait anger. Trait anger was measured using a ten item scale originally developed by Spielberger et al. (1983) and updated by Spielberger (1999). Included on the trait anger scale are items such as: “You are quick tempered”, “You have a fiery temper”, and “You get angry when you are slowed down by others’ mistakes”. Responses range from (1) “Almost Never” to (4) “Almost Always” and were summed to form the final score. Score ranges on this scale were from 10 (for a respondent who marked mark “Almost Never” on all items) to 40 (for a respondent who marked “Almost Always” on all items). The Trait Anger scale has a Cronbach’s Alpha of .87.

In the current study, anger was measured at the state (situational) level using a subscale of Spielberger’s (1999) State-Anger Scale. The “Feeling Angry” scale was a five-item scale measuring how the respondent felt in the situation. It contains items such as “I was furious” and “I was mad” with response choices from “Not at All” (1) to “Very Much So” (4). The final scores on this scale range from 5 to 20. The five item state anger scale has a Cronbach’s alpha of .96.

The last variable introduced in Model 2 was “Harm”. As discussed above, individuals who are more proactively aggressive are more likely to state intrapersonal goals while also being more likely to harm, and be less concerned about, the harm done to the victim (Arsenio et al. 2009). The survey question measuring harm was “How bad did you want to physically harm the opponent?” This variable was measured on an 11 point Likert Scale, 0 being “Not at All” and 10 being “Very Much”.

The last model (Model 3) includes situational level variables that past criminological research has shown to be important factors to consider in high risk situations. These variables include whether the respondent or opponent(s) were under the influence of substances (alcohol or drugs) at the time of the situation, as well as whether the respondent or opponent had a weapon in the situation. All four variables are measured dichotomously (0=No, 1=Yes).

Since this study collected data on situations that were nested within individuals, there is a need for hierarchical modeling. Hierarchical linear modeling (HLM) provides a means to test individual- and situational-level data simultaneously. Specifically, due to the dichotomous outcome variables (violent outcome = 1, avoided violence

outcome = 0), hierarchical generalized linear modeling (HGLM) is applied (see Raudenbush and Bryk 2002). This statistical technique is utilized to address the lack of independence in situation reports, as one respondent could have experienced multiple situations. This study was a contextual analysis that focused on individual behaviors across situations. For this study, one respondent could have experienced both avoided violence and violent situations or multiple situations of one or both types. These experiences were different for all respondents. Therefore, situations varied within the individual and across individuals, so the situational units of analysis were nested within the individual units of analysis. The level-1 model in the current analysis contains variables obtained from the situation reports while the level-2 model contains individual-level variables. As suggested in Raudenbush and Bryk (2002), Level-1 variables were clustered around the group mean, while level 2 variables were clustered around the grand mean (see Raudenbush et al. 2004).

## **RESULTS**

Before proceeding into the discussion of the statistical models, it is important to describe the characteristics of the study sample. Table 1 provides descriptive statistics for the sample of 236 respondents. The mean age of respondents was 28 years-old and study respondents’ predominately self-reported being Caucasian (58.5%) or African American (34.7%). Almost half of all respondents reported receiving a high school diploma or GED (49.60%), while over 27% had not completed eleventh grade. Additionally, the majority of respondents identified as lower or working class (66.5%), with the remainder identifying as middle (29.9%) or upper class (3.0%). In terms of their criminal history, the number of prior arrests and convictions self-reported varied widely with the median respondent reporting five arrests and three convictions.

The 236 respondents in the study reported 466 avoided violence and violence situations. A total of 100 respondents (42%) identified 159 avoided violence situations and 196 respondents (83%) identified 307 violent situations. Many of the respondents offered both violent and avoided violence situations. Over half (65.80%) of all situations reported were violent while the remainder were avoided violence situations. Table 2 displays the descriptive statistics for the social information processing variables that were not included in the HGLM analysis. As shown in the table, respondents determined the intentions of the opponent(s) from a combination of internal (e.g., prior knowledge or trait variables) and external cues (e.g., opponent told respondent or opponent’s behavior). In the reported situations, the majority of cues are external, specifically taken from the opponent’s behavior for both types of situations recorded (42.91% in avoided violence and 48.23% in violent situations). The

**Table 1. Self-Report Descriptive Statistics for the Sample of 236 Inmates**

VARIABLE	FREQUENCY	PERCENT
<b>RACE/ETHNICITY</b>		
Caucasian/White	138	58.50
African American/Black	82	34.70
Other	16	6.70
<b>EDUCATION</b>		
8 <sup>th</sup> Grade or less	3	1.30
9 <sup>th</sup> -11 <sup>th</sup> Grade	62	26.30
HS Diploma or GED	117	49.60
Some College	19	20.80
College Graduate	4	1.70
Post-Grad Study	1	.40
<b>FINANCIAL STATUS</b>		
Lower/Working Class	157	66.50
Middle Class	70	29.90
Upper Class	7	3.00
<b>RELATIONSHIP STATUS</b>		
Single	117	49.60
Partner	96	40.70
Married	23	9.70
VARIABLE	MEAN	STD. DEVIATION
Age	28.71	9.27
VARIABLE	MEDIAN	STD. DEVIATION
Arrests	5	11.64
Convictions	3	6.17

second most retrieved cue is internal, in that the respondents accessed past experiences with the opponent(s) (21.82% in avoided violence and 15.80% in violent situations). This is followed by another external cue with the opponent(s) telling the respondent his or her intentions in the situation (17.82% in avoided violence and 14.55% in violent situations).

In 21.38% of the avoided violence situations, respondents had multiple response generations in the situation. In those situations, 91.17% of the time respondents admitted violence could have occurred, and 50% admitted they would have gotten what they wanted if they would have acted in other ways in the situation. Conversely, in fewer violent situations (13.68%), respondents had multiple response generations in the situation. Of those who did think of other ways in the situation, the majority (61.90%) admitted violence could have been avoided, and 52.38% admitted they would have gotten what they wanted if they would have acted in other ways.

Three separate HGLM models were run for this study (see Table 3). The situational level (level 1) predictors for social information processing (SIP) are intent interpretation, goal, response generation, and did action get you what you wanted (Action Benefit). These SIP

variables are included in all three models, whereas the subsequent models gradually incorporate the remaining situational and emotion (level 1) variables of interest along with the level-2 (individual level) predictors. This was done to determine how the SIP relationships change with the addition of important situational, emotional, and individual (person) level variables. Table 3 presents the findings of the HGLM analysis. It is important to note that all results are discussed in odds ratios and all three models are found to be significant in the analyses.

The first model presented in Table 3 includes only social information processing variables at the situational level. Findings indicate that the intent interpretation, goal, and response generation are all significant predictors of situational outcome. Specifically, when the respondent interprets the opponent's intentions as more positive (less harmful), the odds are 11% less likely that the situation would end in violence (.8889). Similarly, when the respondent reports an interpersonal goal for the situation, there is an almost 77% reduction in the odds that the situation would end in violence compared to avoided violence (.2316). Lastly, if the respondent reports multiple response generations for dealing with the situation, the odds of the situation ending in violence decreases by



**Table 2. Descriptive Statistics for Social Information Processing Variables in Avoided Violence versus Violent Situations**

VARIABLE	AVOIDED VIOLENCE		VIOLENT	
	FREQUENCY	PERCENT	FREQUENCY	PERCENT
ENCODING OF CUES				
Past Exp. w/ Opp.(s)	60	21.82	76	15.80
Past Exp. w/ Others	6	2.18	17	3.53
You Just Knew	38	13.82	69	14.35
Opp.(s) Told You	49	17.82	70	14.55
Opp.(s) Behavior	118	42.91	232	48.23
Other	4	1.45	17	3.53
R MULTIPLE RESPONSE GENERATION				
No	125	78.62	265	86.32
Yes	34	21.38	42	13.68
OUTCOME OF RESPONSE GENERATION				
Avoid Violence	3	8.82	26	61.90
Violence Occur	31	91.17	16	38.09
ACTION BENEFIT				
No	17	50.00	20	47.61
Yes	17	50.00	22	52.38

almost 55% (.4514). More simply, the odds of the situation ending in violence decrease when the respondent did not interpret the opponent as having harmful intentions, the respondent had an interpersonal goal, and if the respondent generated multiple responses in the situation.

In addition to the predictors included in Model 1, Model 2 incorporates the individual level (level 2) measures of trait hostile attribution bias and trait anger, along with the introduction of state anger, state hostile attribution bias, and the intent to do harm at the situational level. When the individual level predictors were added to the model, only trait anger was found to be a significant predictor of situational outcome. Specifically, when trait anger increases, the odds of situational violence increases by 5% (1.0542). Additionally, in Model 2, each of the emotion variables at the situational level is found to be predictive of the situational outcome. When the respondent's level of anger increases, the odds of violence increases by 7% (1.0768). In situations where the respondent reports high hostile attribution bias the odds of violence decreases by roughly 5% (.9527); albeit both anger and HAB are significant at an alpha of .10. Further, the strongest predictor of a violent situation in the model is the intent to do harm. As the intent to do harm to the opponent increases the odds of the situation ending in violence increases by 23% (1.2316). Both goal and response generation variables remain significant and in the same directions in Model 1, but opponent's intentions is no longer a significant predictor of situational outcome. Models 1 and 2 suggest that decision making variables

from Crick and Dodge's (1994) social information processing theory, along with emotional variables suggested by Lemerise and Arsenio (2000), play a significant role in the studied situations.

In staying consistent with the situational factors literature, the final model (Model 3) also includes whether the opponent and/or respondent were using substances or had any weapons during the situation (Birkbeck and LaFree 1993; Horney 2006; Sampson and Lauritsen 1994). Of the four new variables, the respondent's substance use and the opponent having a weapon are significant predictors of the outcome variable. It should be noted that in total, the respondent's substance use has the single strongest effect on the odds likelihood of situational violence outcome. Specifically, if the respondent was using drugs or alcohol at the time of the situation, the odds of the situation ending in violence increases by more than 500% (6.1116). Similarly, when the opponent had a weapon(s) the odds of a violent situation increases by 134% (2.3421). Conversely, if the respondent had a weapon, the odds of a violent situation decreases; or rather the odds likelihood of avoided violence increases by 31% (.6969). The opponent's substance use does not significantly predict situational outcome in our sample. In agreement with respondent substance use, it is expected that if an offender was using a substance(s) at the time of the situation, it would more likely end in violence. However, this was not seen in our study. As seen in the previous models, in Model 3 trait anger is a significant predictor of outcome at the individual level, while goal and

**Table 3. HGLM Models Results**

VARIABLE	Model 1			Model 2			Model 3		
	Coefficient	SE	OR	Coefficient	SE	OR	Coefficient	SE	OR
<b>INDIVIDUAL</b>									
Intercept	.6844**	.1164	1.9826	.7437**	.1042	2.1038	.7839**	.1106	2.1900
Host. Att. Bias				-.0308	.0261	.9696	-.0321	.0279	.9684
Trait Anger				.0528*	.0184	1.0542	.0522*	.0200	1.0536
<b>SITUATIONAL</b>									
Intent Interpretation Goal	-.01178*	.0567	.8889	-.0882	.0694	.9156	-.0900	.0753	.9142
Resp. Generation	-1.4628**	.3697	.2316	-1.1338*	.4615	.3218	-1.1021*	.4886	.3322
Action Benefit	-.07954*	.3572	.4514	-.8882*	.4684	.4114	-.7491	.4969	.4728
Anger				.3247	.4197	1.3836	.6258	.4102	1.8698
Host. Att. Bias				.0740+	.0429	1.0768	.0589	.0438	1.0607
Harm				-.0484+	.0273	.9527	-.0526+	.0291	.9487
O substance				.2083**	.0569	1.2316	.2118**	.0577	1.2359
R substance							-.3441	.4165	.7089
O weapon							1.8102**	.4199	6.1116
R weapon							.8511*	.3895	2.3421
							-.3612+	.5895	.6969

Note: \*\*p<.01, \*p<.05, +p<.1

intent to do harm remains significant at the situational level.

## DISCUSSION

This research sought to examine the differences in decision making, using social information processing theory, in violent and avoided violence situations. As expected, situations where the respondents' report poor or ineffective SIP are more likely to end in violence. Specifically, in violent situations, respondents interpret opponents intentions more negatively, select more intrapersonal goals, generate fewer behavioral responses, and admit their actions benefitted them in the situation. As Lerner and Arsenio (2000) suggest, emotions played a significant role in the studied situations. Finally, situational variables such as substance use and weaponry are significant predictors of situational outcome. Before discussing the implications of the current findings, we first address limitations of the study.

First, while the current study surveyed 236 newly jailed inmates and collected 466 situational reports, statistical power could be a problem. Although the sample size was considerable, Model 3 included a large number of

variables. This, in turn, could make it harder to find statistically significant relationships, as well as explain why significant predictive variables in Models 1 and 2 lost significance in the last model.

Second, generalizability for the current study is restricted due to the use of jailed inmates in four county facilities in Pennsylvania. Jailed inmates may have different cognitive and emotional abilities compared to the members of the free, general population. However, the general population does not participate in violent situations enough to conduct an adequate study. Though not generalizable to the entire population, the individuals studied have substantial contact with the criminal justice system, and they represent an interesting and compelling group for researchers to study. This type of sampling resulted in ideal coverage of potential respondents and studied situations.

Lastly, inmates were asked to retrospectively self-report these behaviors. Given that the respondents were asked to recall situations that took place up to 24 months before their incarceration, and that the respondents were incarcerated, creates some concerns with their willingness to truthfully/accurately answer survey items and recall

details of these specific events. Every effort was taken to reduce the respondents' concerns about detailing past illegal behavior, including reminding the respondents of strict confidentiality terms. Past research has shown that samples of incarcerated offenders accurately report their illegal behaviors (see Junger-Tas and Marshall 1999). For recall concerns, a life events calendar was utilized to help frame where, in time, these events occurred during the 24 month period. Research has indicated that individuals use "autobiographical sequences" to organize personal memories, and the recall of specific memories usually improves with cues (see Bradburn et al. 1987; Caspi et al. 1996; Roberts and Horney 2010; Wells and Horney 2002). While the events reported by the respondents may reflect some reconstruction and reinterpretation by respondents, we believe this is outweighed, given that respondents are reporting their actual involvement in high risk for violence scenarios rather than merely responding to hypothetical vignettes. We acknowledge these limitations but also argue that the study presents certain advantages over the typical tests of SIP.

The results of the present study suggest that studying violence among adults at the situational level warrants further examination. Situational analysis allows researchers to focus on an offender's decision making in high risk for violence situations. Decision making is unique to the social context in which it occurs, and involves a highly complex interplay between the individuals involved and environmental factors. The current study examined cognitive aspects of Crick and Dodge's (1994) social information processing theory, along with emotional aspects proposed by Lemerise and Arsenio (2000). While Crick and Dodge's (1994) social information processing theory is well studied in children and adolescents, it has yet to be adequately tested with adults. This research sought to examine the potential of social information processing theory with a group of adults who, arguably, have more defined and rigid "databases" compared to children and adolescents.

As the results indicate, there is a need to further study the theory as applied in violent and criminal situations. Three out of four of the SIP variables (i.e., intent interpretation, goal, and response generation) were significant predictors of violent outcomes in the first model. Two remained significant in the second model (i.e., goal and response generation) and goal remained significant in the third. When drugs and alcohol, as well as weapons variables, were included, the "response generation" variable lost significance at the .05 level. However, this variable could be interacting with the respondent's substance use. Past research has found that substances alter decision making capabilities of individuals in situations (see Chambers et al. 2009). Many tests of social information processing have utilized hypothetical scenarios. While this approach is useful, it does not allow for an understanding of how alcohol and drug use

influence decision-making in real life. With our sample of self-reported, high risk for violence situations, it appears that substance use by the respondent best predicts violent outcomes. This suggests, not surprisingly, a break-down in decision making with use. Future research should focus on this relationship to gain a better understanding of the interplay between SIP and substance abuse in high risk situations.

In addition to the SIP variables, our study examined the role of emotions as suggested by Lemerise and Arsenio (2000). We tested anger at both the individual and situational level. Trait anger reached statistical significance in Models 2 and 3, while situational anger approached statistical significance in Model 2, before the introduction of other situational variables. Our findings suggest that anger may be mediated by other variables (in the present study, perhaps intent to harm and substance use). In addition, given our sample of offenders, future researchers should examine the role of anger and other emotions with different population samples.

The findings from the present study suggest that indicators of proactive aggression (i.e., goal, harm) significantly influence the escalation from avoided violence to actual violence. In situations where an intrapersonal goal was stated along with the respondent indicating wanting to do more harm to the opponent, the odds of violence significantly increased. The findings however, show less support for reactive aggression variables (i.e., intent interpretation and HAB). While interpreting another's intentions more negatively increased the odds of a violent outcome in the first two models, this variable failed to reach statistical significance in the final two models. These findings may be the result of studying adult offenders. This sample is quite different from those that have been previously used in social information processing studies. It suggests that more research on SIP with adults, in general, is needed to determine if the findings from children and adolescents are consistent.

Additionally, state (situational) hostile attribution bias approached significance at the .05 level in Models 2 and 3. Contrary to our expectations, however, in all models it had a negative relationship with violence. As stated in the literature review, past research has found that aggressive youth (especially those who are reactively aggressive) are more likely to attribute hostile intentions to others in a situation. The current study's results concerning hostile attribution bias, counters this past literature. This difference may be, in part, due to methodological issues. Many of the past studies on hostile attribution bias have measured aggression, broadly, rather than violence specifically. In this sample of adult male offenders, we chose to have our "violence" measure clearly depict situations of more serious violence. In contrast our "avoided violence" measure mainly involved: threats of violence, pushing and shoving, and encouraging violence. Thus for this sample, reporting high situational HAB may

lead to more defensive and aggressive “avoided violence” reactions rather than violent ones. Thus, HAB may be associated with aggressive threats and verbal confrontations but may stop short of escalating to violence.

Thus, future research should examine this distinction more carefully. Additionally, future research should also examine the “moral domain” approach (see Arsenio and Lemerise 2004) to better understand how interpretations of the morality of the offender’s actions can influence social information processing stages, the emotions that accompany these stages, and reactive versus proactive aggression.

It is important to examine weaponry in any high risk situation. We found that a violent situation was significantly more likely if the opponent had a weapon. A possible explanation for this result is that many of the respondents reported that the opponent was the initial aggressor in the situation. If so, these opponents possibly felt more secure in participating in violence because of the weapon. However, if the respondent had a weapon, the chances for a violent situation decreased. This finding contradicts Wells and Horney’s (2002) weaponry study. This is of interest since we used Wells and Horney’s operational definitions, and questions, to differentiate between violent and avoided violence situations. Future research should examine decision making, intentions to harm, injury, and weaponry more thoroughly to explain this unique relationship.

In conclusion, the findings of the present study provide partial support for social information processing as an explanation for violent outcomes in a sample of adult offenders. In particular, measures that could be associated with “proactive aggression” were particularly salient. Understanding decision making in high risk for violence encounters requires accounting for a wide array of person, cognitive, emotional, and situational variables. Social information processing theory seems to account for these complexities more easily than the rational choice perspective of crime. The results of the present study provide support for the continuation of utilizing social information processing theory in the study of decision making in violent situations.

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