THE RELATION OF RESPONSE EVALUATION AND DECISION PROCESSES AND LATENT MENTAL STRUCTURES TO AGGRESSIVE AND PROSOCIAL RESPONSE SELECTION

Kristyn A. Saveliev

A Dissertation

Submitted to the Graduate College of Bowling Green State University in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2010

Committee:

Eric Dubow, Ph.D., Advisor

Thomas Chibucos, Ph.D.
Graduate Faculty Representative

Dara Mush-Eizenman, Ph.D.

Catherine Stein, Ph.D.
The present study examined the relation among Response Evaluation and Decision (RED; Fontaine & Dodge, 2006) processes, latent mental structures, and aggressive and prosocial response selection in a sample of 215 children. Results showed that aggressive-supporting RED processes and latent mental structures independently predicted children’s selection of aggressive responses in hypothetical peer provocation scenarios. Support was found for the proposed model whereby RED processes mediated the relation between latent mental structures and response selection. Aggressive-supporting normative beliefs and low affective control of anger predicted favorable RED for aggressive responses (i.e., high efficacy and valuation of aggressive responses; high expectancy and valuation of positive outcomes resulting from aggressive behavior), which in turn predicted aggressive response selection. Examinations of the relation among prosocial-supporting RED processes, latent mental structures, and response selection yielded similar results. Prosocial-supporting normative beliefs and high affective control of anger predicted favorable RED for prosocial responses, which predicted selection of prosocial responses to peer provocation.
I dedicate this dissertation to my parents.
ACKNOWLEDGMENTS

I would foremost like to thank my advisor, Dr. Eric Dubow, for his interest and encouragement during this project. I am truly grateful for his guidance over the past seven years. I would like to thank my dissertation committee, Drs. Chibucos, Musher-Eizenman, and Stein, for their thoughtful feedback and suggestions. I am especially grateful to the students and teachers whose participation made my project possible. Finally, I would like to thank my friends and family (and Esti) for all the support they have shown.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Social Information Processing (SIP): An Overview</td>
<td>2</td>
</tr>
<tr>
<td>Social Information-Processing (SIP) Models</td>
<td>4</td>
</tr>
<tr>
<td>Social information-processing models and aggressive behavior</td>
<td>9</td>
</tr>
<tr>
<td>Definition of aggressive behavior</td>
<td>9</td>
</tr>
<tr>
<td>Relation of social information processing to aggressive behavior</td>
<td>9</td>
</tr>
<tr>
<td>Gender differences in aggressive behavior and aggressive-supporting</td>
<td>11</td>
</tr>
<tr>
<td>cognitions</td>
<td></td>
</tr>
<tr>
<td>Social information-processing models and prosocial behavior</td>
<td>12</td>
</tr>
<tr>
<td>Definition of prosocial behavior</td>
<td>12</td>
</tr>
<tr>
<td>Gender differences in prosocial behavior and prosocial-supporting</td>
<td>12</td>
</tr>
<tr>
<td>cognitions</td>
<td></td>
</tr>
<tr>
<td>Online Decision Processes and Latent Mental Structures</td>
<td>13</td>
</tr>
<tr>
<td>Online decision processes and the response evaluation and decision</td>
<td></td>
</tr>
<tr>
<td>heuristic</td>
<td>13</td>
</tr>
<tr>
<td>Process one: application of a primary threshold of acceptability</td>
<td>15</td>
</tr>
<tr>
<td>Process two: response efficacy and valuation. Response efficacy</td>
<td>16</td>
</tr>
<tr>
<td>Response valuation</td>
<td>17</td>
</tr>
<tr>
<td>Process three: outcome expectancy and valuation. Outcome expectancy</td>
<td>18</td>
</tr>
<tr>
<td>Outcome valuation</td>
<td>19</td>
</tr>
<tr>
<td>Process four: response comparison</td>
<td>21</td>
</tr>
</tbody>
</table>
Process five: response selection............................................ 22

Latent Mental Structures.......................................................... 23

Normative beliefs........................................................................... 24

Trait anger ...................................................................................... 24

Persecution beliefs .......................................................................... 25

Emotional regulation.......................................................................... 25

Relation Between Online Processing and Latent Mental Knowledge Structures.... 25

The Present Study............................................................................ 27

Hypotheses....................................................................................... 28

METHOD................................................................................................ 31

Participants......................................................................................... 31

Procedures......................................................................................... 32

Measures........................................................................................... 32

Response Evaluation and Decision (RED) Processes ......................... 32

Response efficacy ............................................................................. 32

Response valuation ........................................................................... 33

Outcome expectancy .......................................................................... 33

Outcome valuation ............................................................................ 35

Response selection ............................................................................ 35

Latent Mental Structures.................................................................... 36

Normative beliefs about aggression.................................................... 36

Trait anger ......................................................................................... 36

Emotional regulation.......................................................................... 37
Persecution beliefs ................................................................. 38

RESULTS ..................................................................................... 39

Preliminary Analyses ............................................................... 39

Data reduction ........................................................................... 39

Creating composite RED variable scores .................................. 41

Determining demographic control variables ............................ 44

Major Analyses ............................................................................ 45

Hypothesis one ............................................................................ 45

Hypothesis two ............................................................................ 46

Hypothesis three ........................................................................... 47

Hypothesis four ............................................................................ 48

DISCUSSION ................................................................................ 53

Hypothesis One ............................................................................ 53

Hypothesis Two ............................................................................ 56

Hypothesis Three .......................................................................... 59

Hypothesis Four ............................................................................ 60

Limitations .................................................................................. 64

Sample ....................................................................................... 64

Constructs .................................................................................... 65

Design .......................................................................................... 66

Implications ................................................................................ 68

REFERENCES .............................................................................. 71
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Figure/Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Means and Standard Deviations for Latent Mental Structure Variables</td>
<td>98</td>
</tr>
<tr>
<td>2</td>
<td>Intercorrelations Among Latent Mental Structure Variables</td>
<td>99</td>
</tr>
<tr>
<td>3</td>
<td>Means and Standard Deviations for Response Evaluation Variables and</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Response Selection Variables</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Intercorrelations Among Response Efficacy and Response Valuation for</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Aggressive and Prosocial Behavior Variables</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Intercorrelations Among Outcome Expectancy and Outcome Valuation for</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>Aggressive and Prosocial Behavior Variables</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Means and Standard Deviations for Response Evaluation and Outcome Evaluation Variables</td>
<td>103</td>
</tr>
<tr>
<td>7</td>
<td>Intercorrelations Among Outcome Evaluation for Aggressive and Prosocial Behavior Variables</td>
<td>104</td>
</tr>
<tr>
<td>8</td>
<td>Between-Subjects Sex and Grade Differences in Major Study Variables</td>
<td>105</td>
</tr>
<tr>
<td>9</td>
<td>Between-Subjects Race and School Differences in Major Study Variables</td>
<td>106</td>
</tr>
<tr>
<td>10</td>
<td>Predicting Aggressive Response Selection from the Demographic, Response Evaluation, and Outcome Evaluation for Aggressive Behavior Variables</td>
<td>107</td>
</tr>
<tr>
<td>11</td>
<td>Predicting Prosocial Response Selection from the Demographic, Response Evaluation, and Outcome Evaluation for Prosocial Behavior Variables</td>
<td>108</td>
</tr>
<tr>
<td>12</td>
<td>Predicting Aggressive and Prosocial Response Selection from the Demographic and Latent Mental Structure Variables</td>
<td>109</td>
</tr>
</tbody>
</table>
Demographic Variables, Latent Mental Structure Predictor Variables, and the Response Evaluation and Outcome Evaluation for Aggressive Behavior Mediator Variables Predict Aggressive Response Selection ......................................................... 110

Demographic Variables, Latent Mental Structure Predictor Variables, and the Response Evaluation and Outcome Evaluation for Prosocial Behavior Mediator Variables Predict Prosocial Response Selection ...................................................... 111
FIGURE CAPTIONS

1. The Association between Latent Mental Structure Variables and Response Selection for Aggressive Behavior as Mediated by Response Evaluation and Outcome Evaluation for Aggressive Behavior Variables

2. The Association between Latent Mental Structure Variables and Response Selection for Prosocial Behavior as Mediated by Response Evaluation and Outcome Evaluation for Prosocial Behavior Variables
INTRODUCTION

According to social information-processing (SIP) theory, social-cognitive processes influence the development and maintenance of behavior, including aggressive behavior (Crick & Dodge, 1994; Dodge, 1986; Huesmann, 1986; 1988). Through social-cognitive processes (e.g., interpretation of social cues and events; evaluation of the acceptability of behaviors; predictions of the likelihood that positive or negative outcomes will result from various behavioral responses), individuals solve social problems and regulate their behavior. Much emphasis has been placed on examining the discrete contributions of deficient social information processes to aggressive behavior. These processes include response evaluation and decision processes (i.e., evaluations of possible behavioral options generated in response to complex social cues that occur in specific situations) and aggressive-supporting latent mental structures (i.e., mental representations of past experiences and events which are stored in long-term memory and influence future behavior).

In recent years, researchers have begun to examine how patterns of social information processing predict aggressive behavior rather than the discrete contributions of latent mental structures and individual interpretive and evaluative steps. However, there is little research examining specific models of how children’s response evaluation processes and latent mental structures relate to the prediction of children’s decisions to engage in aggressive behavior. In addition, there has been relatively little research on the relation among response evaluation processes, latent mental structures, and prosocial behavior.

The present study examined the relation between children’s response evaluation processes (i.e., response efficacy, response valuation, outcome expectancy, and outcome valuation) and latent mental structures (i.e., normative beliefs, persecution beliefs, trait anger, and emotional regulation) to aggressive and prosocial response selection in hypothetical peer conflict situations. To address
limitations in previous literature, a specific model was proposed whereby evaluation processes in response to peer conflict situations mediate the relation between latent mental structures and response selection (i.e., an individual’s decision to behave in an aggressive or prosocial manner during a social conflict situation). The following literature review will discuss the role of response and outcome evaluation processes, mainly response efficacy and valuation and outcome expectancy and valuation, and latent mental structures such as normative beliefs, persecution beliefs, trait anger, and emotional regulation, in the development of aggressive and prosocial response selection. Limitations of previous research will also be discussed.

*Social Information Processing (SIP): An Overview*

Social cognition has been defined as a process whereby individuals make sense of themselves and others (Fiske & Taylor, 1991). According to social information-processing (SIP) theory, social-cognitive processes influence the development and maintenance of behavior. Individuals are thought to utilize social-cognitive processes to solve social problems and regulate their behavior. To better understand how children’s aggressive behavior is mediated by these social-cognitive processes, the social information-processing model has been specifically applied to children’s aggressive behaviors. These information-processing models provide a heuristic for understanding how individuals evaluate, across multiple stages, environmental and social cues (Crick & Dodge, 1994; Huesmann, 1988). The steps hypothesized in information-processing models range from the basic encoding of situational social and environmental cues to more advanced processes such the selection and implementation of recalled or newly developed behavioral response options. Deficiencies in all processing steps have been found to be related to behavioral problems in children and adolescents (Dodge, 2003; Yoon, Hughes, Gaur, & Thompson, 1999).
In recent years, emphasis has been placed on examining how patterns of social information processing predict aggressive behavior rather than the discrete contributions of individual interpretive and evaluative steps. That is, some researchers have investigated the relation of a maladaptive information-processing style to aggressive behavior rather than specific cognitive-to-behavior effects (Lansford, Malone, Dodge, Crozier, Pettit, Bates et al., 2006; Weiss, Dodge, Bates, & Pettit, 1992). This type of research is especially relevant to childhood aggressive behavior as some children as young as three-years old display consistent patterns of aggressive-supporting reasoning and decision making (Harvey, Fletcher, & French, 2001). In an effort to examine the process patterns that occur during social information processing, Fontaine and Dodge (2006) have proposed a heuristic for understanding rational, evaluative decision making in specific social situations (i.e., online processing). This heuristic is conceptualized as Response Evaluation and Decision (RED). RED processes are thought to have particular usefulness in assessing individuals’ online patterns of social information processing, especially as they relate to understanding the development and maintenance of aggressive behavior.

In addition to the RED heuristic, researchers have also focused on the contributions of latent mental structures to social information processing and the development and maintenance of aggressive behavior. Latent mental structures are mental representations of past experiences that are integrated with an individual’s biological predispositions, personality traits, and capabilities. Latent mental structures assist individuals in quickly interpreting large amounts of social information (Einhorn & Hogarth, 1981, as cited in Crick & Dodge, 1994) and influence the processing of social cues. Differences among individuals’ abilities to effectively process information are thought to be partially grounded in different formations of latent mental structures (e.g., levels of trait anger, differences in emotional regulation abilities).
Current social information-processing models account for the contributions of both online processes, such as RED, and latent mental structures to the development and maintenance of aggressive behavior. However, there has been little research regarding specific models of how the effects of how response evaluation processes and latent mental structures might jointly contribute to the prediction of aggressive behavior (Burks, Laird, Dodge, Petit, & Bates, 1999) and no studies of how these constructs jointly contribute to the prediction of aggressive and prosocial response selection.

**Social Information-Processing (SIP) Models**

When applied to understanding the development and maintenance of children’s aggressive behavior, according to information-processing theory, social-cognitive processes mediate the relation between social-environmental input in a conflict situation and aggressive behavioral responses (Huesmann, 1998). Behavior is therefore influenced by both the nature of external events (e.g., environmental context, observable qualities of interaction with the partner such as vocal pitch and eye gaze) and the individual’s social-cognitive processing of these events (e.g., attributions of intent, retrieval from memory of similar incidents).

There are two main social information-processing models that have been used to explain aggressive behavior in children (Crick & Dodge, 1994; Huesmann, 1998). Both models hypothesize that social information processing occurs across several stages and that deficient processing within each stage is related to aggressive behavior. Crick and Dodge (1994) have reformulated an information-processing model based on earlier work by Dodge (1986; Dodge & Crick, 1990). This reformulated model posits that there are six information-processing steps that occur prior to an individual’s engagement in behavior. These steps are as follows: (1) encoding of external and internal cues during the social encounter; (2) interpretation of situational cues; (3)
formulation and selection of social goals; (4) retrieval from memory of available problem-solving strategies; (5) evaluation of the effectiveness of available strategies; and (6) execution of the chosen response.

In Step One, individuals encode information from their external social environment and their internal physiological reactions in response to the social stimulus. After this information is encoded, the information is then interpreted by making social attributions and inferences (e.g., interpreting the intent of other’s behaviors; evaluations of past interactions with others; Stage Two). In Stage Three, the individual determines what goals he or she would like to accomplish in the social situation (i.e., the desired outcome). There are several types of social goals an individual can attempt to achieve in a social situation (Renshaw & Asher, 1983). For example, an individual might want to gain control over others (i.e., control goals), attain a desired object (i.e., instrumental goals), maintain a friendship (i.e., relationship-maintenance goals), or get revenge on others for a perceived wrong-doing (i.e., revenge goals). After goals are developed and selected, the individual then generates a list of possible behavioral responses (Step Four). These responses are either retrieved from memories of similar past experiences or, if the situation is novel, are newly developed based on the demands of the situation. During Step Five, the individual evaluates the possible response options based on factors such as the likelihood that he or she can sufficiently enact the behavioral response (i.e., response efficacy) and the likelihood that the behavioral response will lead to a desired outcome (i.e., outcome expectancy). Finally, the individual executes the behavioral response that he or she has evaluated most favorably (Step Six).

In comparison to Crick and Dodge’s (1994) reformulated model, Huesmann’s (1998) unified model conceptualizes social information processing as occurring across four comprehensive steps which are as follows: (1) cue attention and evaluation; (2) script activation and retrieval; (3)
script evaluation; and (4) interpretation of environmental response. In Step One of Huesmann’s model, individuals attend to cues from their social environment and evaluate these cues by making interpretations (e.g., intent attributions). In Step Two, the individual either retrieves a script (i.e., a mental representation of similar events that includes typical behaviors and outcomes) from memory or develops a new script if none can be accessed from memory. The individual then evaluates the script (i.e., Step Three) based on relevance to the current situation, general appropriateness of the potential response (e.g., normative beliefs about acceptability), potential outcomes (i.e., outcome expectancy) and the degree to which the individual believes he or she is capable of executing the particular response (i.e., response efficacy). Finally, in Step Four, the individual enacts a behavioral response and evaluates the positive and negative consequences of that response. This information is stored in memory and informs script selection and evaluation in future events.

Tisak, Tisak, and Goldstein (2006) noted several similarities between the reformulated model by Crick and Dodge (1994) and Huesmann’s (1998) unified social information-processing model. In particular, the authors noted that Step One of Huesmann’s (1998) unified model (i.e., cue attention and evaluation) is comparable to Step One (i.e., encoding of external and internal cues) and Step Two (i.e., interpretation of situational cues) of Crick and Dodge’s (1994) reformulated model. Likewise, Step Two of Huesmann’s model (i.e., script activation and retrieval) is similar to Step Four of Crick and Dodge’s (1994) model (i.e., retrieval from memory of available problem-solving strategies). Finally, Step Three of Huesmann’s (1998) model (i.e., script evaluation) has similarities to Step Five (i.e., evaluation of the effectiveness of available strategies) of the model posited by Crick and Dodge (1994).

Consistent with earlier theories (Dodge, 1986; Eron, 1987), both models posit that deficiencies in one or more of the social information-processing stages result in processing errors.
that increase the likelihood that an individual will engage in maladaptive or aggressive behaviors. For example, hostile attribution bias is a widely studied construct that is focused primarily on faulty interpretations and evaluations of ambiguous social cues. Researchers have found that aggressive children are more likely than non-aggressive peers to interpret ambiguous cues (e.g., being bumped by another person in a hallway) as hostile or purposeful compared to non-aggressive peers who are more likely to interpret these cues as benign or accidental (Dodge, 1980; Dodge & Coie, 1987; Runions & Keating, 2007; Slaby & Guerra, 1988). Aggressive behavior also has been related to deficiencies in attention to environmental cues (Dodge, 1986; Dodge & Frame, 1982; Lochman & Dodge, 1998), social goal formation (Erdley & Asher, 1996; Lochman & Lenhart, 1993; Renshaw & Asher, 1983), retrieval and development of problem-solving strategies or scripts (Dodge & Crick, 1990; Huesmann & Eron, 1989; Keltikangas-Jarvinen & Pakaslahti, 1999; Lochman & Dodge, 1994; Quiggle, Panak, & Dodge, 1992; Slaby & Guerra, 1988), and evaluation of the effectiveness of available strategies or scripts (Cuddy & Frame, 1991; Huesmann & Guerra, 1997; Perry, Perry, & Rasmussen, 1986). Effect sizes of studies that assess these cognitive-to-behavior effects are generally medium to large in size (i.e., mean \( r \)s range from .33 for interpretive processes to .52 for response decision processes).

Another similarity between the models is the presence of feedback loops by which an individual in later stages of social information processing returns to earlier stages to reconsider and re-evaluate information (Crick & Dodge, 1994; Huesmann & Eron, 1989). Although both models primarily serve as heuristics for understanding how individuals proceed logically and sequentially through rational decision making processes, there is evidence that individuals engage in multiple steps simultaneously and select response options without engaging in all steps. An individual engaged in a late-stage process who remains unsatisfied with the generated or accessed potential
response options might return to earlier stages in order to encode more information to develop or access new responses (Pakaslahti, 2000). For example, Troop-Gordon and Asher (2005) found that children changed their social goals after being provided negative feedback regarding their conflict resolution strategies. That is, the initial social goals formulated and selected in Stage Three of Crick and Dodge’s (1994) reformulated model were revised after being negatively evaluated in Stage Five (i.e., evaluation of the effectiveness of available strategies). These results suggest that negative feedback regarding the effectiveness of chosen strategies instigates a social-cognitive feedback loop, which in turn prompts a re-clarification of earlier social information-processing steps. Both models accommodate this type of feedback loop.

Although the two models share fundamental similarities in their explanation of social information processing and its relation to aggressive behavior, each model places emphasis on different processing stages. Crick and Dodge’s (1994) reformulated information-processing model places greater emphasis on cue interpretation and social goals. Cue interpretation is the process by which individuals attend to, encode, and interpret cues from their environment. Aggressive individuals are thought to be more likely than non-aggressive individuals to perceive the cues of others as aggressive or hostile (i.e., hostile attribution bias) and then to respond accordingly. Crick and Dodge also emphasize the role of social goals (i.e., objectives an individual attempts to accomplish in social situations; Pervin, 1989). Aggressive individuals are hypothesized to perceive utilizing aggressive behavior in social situations as an appropriate method to obtain selected goals whereas non-aggressive individuals are more-likely to perceive prosocial behavior as the preferred method for obtaining goals.

In contrast, Huesmann’s (1988) original model places greater emphasis on scripts (i.e., cognitive representations of events, likely behaviors, and their outcomes in specific social
situations). These scripts are stored in an individual’s memory and are used to direct future behaviors, such as aggressive responses in social situations. According to Huesmann’s model, aggressive individuals possess more aggressive scripts than non-aggressive individuals, and the behaviors of aggressive individuals are guided by positive evaluations of these aggressive scripts.

**Social information-processing models and aggressive behavior.**

**Definition of aggressive behavior.** Aggressive behavior has been defined in a number of ways including behavior that is aimed at harming or injuring another person (Coie & Dodge, 1998) and behavior used to intentionally injure or irritate another person (Berkowitz, 1993). Aggressive behavior has been categorized by Dodge and Coie (1987) as either an angry response to a perceived provocation (i.e., reactive aggression) or a goal-directed behavior without underlying anger (i.e., proactive aggression). Aggressive behavior also has been conceptualized as including acts that are both direct and indirect in nature (Björkqvist, Lagerspetz, & Kaukianen, 1992; Lagerspetz & Björkqvist, 1994; Lagerspetz, Björkqvist & Peltonen, 1988). Direct aggression includes behaviors in which a target is physically attacked (e.g., hitting, kicking, and pushing) or verbally intimidated (e.g., yelling). Indirect aggression (also referred to as relational aggression; Crick & Grotpeter, 1995) is more covert in nature and includes behaviors which involve social manipulation (e.g., gossiping about a peer’s appearance, excluding a peer from a social group).

**Relation of social information processing to aggressive behavior.** According to social information-processing models, aggressive-supporting cognitions contribute to the development and maintenance of aggressive behavior in children. Both Crick and Dodge (2004) and Huesmann (1998) posited that aggressive behavior develops from repeated, deficient processing during one or more stages of social information processing. That is, children who have a tendency to process information in an aggressive style (e.g., children who interpret ambiguous social cues as hostile or
believe that aggressive behavior is more likely to result in a desired outcome compared to non-aggressive behavior) are more likely to display chronic patterns of aggressive behavior than children who process information in a prosocial or benign manner (Fontaine, Burks, & Dodge, 2002). As noted earlier, previous research has shown that deficiencies at each step of the social information-processing models are independently associated with aggressive behavior (Dodge, Pettit, Bates, & Valente, 1995; Lansford et al., 2006).

It is generally believed that aggressive-supporting cognitions are maintained as the result of a child’s engagement in aggressive behaviors (Fontaine, Yang, Dodge, Bates, & Pettit, 2008). For example, a child who repeatedly utilizes verbal aggression in conflict situations might be more likely to internalize his or her behavior (e.g., view aggressive behavior as consistent with himself or herself), view verbal aggression as a “normal” response (e.g., have normative beliefs that aggressive behavior is acceptable), and believe that he or she is capable of acting aggressively (e.g., have aggressive response efficacy) based on the previous outcomes that have resulted from aggressive behavior. A child who displays patterns of verbal aggression might also, based on past experiences, expect rewards for behaving aggressively (i.e., positive outcome expectancies) or be less aware of the possible negative consequences of aggressive behavioral response options (i.e., negative outcome expectancies; Warden & Mackinon, 2003). When faced with a novel social situation, a child who engages in patterns of aggressive behavior might have a difficult time developing or retrieving from memory non-aggressive response options or scripts comprising the child’s latent mental structures, which in turn limits the child’s ability to select and engage in non-aggressive behavioral responses. These intrapersonal and social consequences are thought to influence later social information processing and increase the likelihood that the individual will respond in an aggressive manner in future situations (Dodge, Coie, & Lynam, 2006).
Gender differences in aggressive behavior and aggressive-supporting cognitions. In addition to the contributions of individual social information-processing steps in predicting aggressive behavior, researchers also have also explored widely gender differences in aggressive behavior and aggressive-supporting cognitions. Boys have been found to engage in direct (i.e., physical and verbal) aggression more frequently than girls (see Block, 1983, for a review). Conversely, girls have generally been found to engage in indirect (Lagerspetz & Björkqvist, 1994; Lagerspetz, Björkqvist, & Peltonen, 1988; Österman et al., 1998) and relational (see Crick et al., 1999 and Crick, Ostrov, & Kawabata, 2007 for reviews) aggressive behaviors at a higher rate than boys. However, more recent findings suggest that the gender gap in direct aggressive behavior rates might be decreasing (Moretti & Odgers, 2002; Nichols, Brooks-Gunn, & Botvin, 2006). There is also growing evidence that boys engage in indirect and relational aggression at a similar or higher rate than girls (David & Kistner, 2000; Salmivalli & Kaukiainen, 2004). This shift to a less prominent gender gap might be related to changing social perceptions regarding approval of aggressive behavior (Leadbeater, Boone, Sangster, & Mathieson, 2006) and increases in aggressive female role-models presented in the media since the 1970s (Huesmann, Moise-Titus, Podolski, & Eron, 2003).

Gender differences in social-cognitive processes have been examined less thoroughly (Crain, Finch, & Foster, 2005). Results of this research suggest that boys tend to exhibit more aggressive-supporting cognitions than girls. For example, Perry et al. (1986) found that boys have higher levels of response efficacy for aggressive behavior and are more confident that aggressive behavior will lead to a desired outcome (i.e., have greater positive outcome expectancies) than girls. Boys have also been found to exhibit higher rates of hostile attribution bias than girls (Schultz, Izard, & Ackerman, 2000). Musher-Eizenman et al. (2004) found that girls reported
higher levels of anger control (i.e., the ability to regulate experiences of anger) than boys, whereas boys reported higher levels of positive self-evaluation following aggressive behavior and higher response efficacy for aggressive behavior than girls. In addition, boys approved of the use of aggression to respond to both direct (e.g., hitting, teasing) and indirect (e.g., gossiping) provocations from peers more frequently than girls.

*Social information-processing models and prosocial behavior.*

*Definition of prosocial behavior.* Prosocial behavior has been defined as voluntary behavior that benefits another person (Eisenberg & Miller, 1987). One limitation in research involving prosocial behavior is that there is little distinction among types of prosocial behaviors (Carlo et al., 2003). Assessment of prosocial behavior in children traditionally has included the measurement of frequency of helping, sharing, comforting, and altruistic behaviors (Eisenberg & Fabes, 1998). However, an examination of children’s normative beliefs about prosocial behavior by Greener and Crick (1999) provided support for in the inclusion of relationally inclusive behavior (i.e., acts that initiate and maintain social ties such as “let someone play with you”), in addition to traditionally measured helping and sharing behaviors.

*Gender differences in prosocial behavior and prosocial-supporting cognitions.* Research regarding gender differences in prosocial behavior generally indicates that girls engage in prosocial behaviors such as helping and sharing more frequently than boys (Fabes et al., 1999). Girls are rated as engaging in prosocial behavior more frequently than boys by parents, teachers, and peers (Holmgren, Eisenberg, & Fabes, 1998).

There is relatively little research regarding prosocial-supporting cognitions and, as such, there are few examinations of gender differences in these constructs. Brookmeyer, Henrich, and Schwab-Stone (2005) conceptualized prosocial cognitions in terms of a “benign attribution bias”
(i.e., interpretation of ambiguous peer provocation as benign and accidental rather than aggressive and purposeful.) The authors examined the buffering role of prosocial cognitions among a diverse sample of urban middle school students who had been exposed to violence. Girls 11- to 15-years old who witnessed violent acts were less likely to later commit violent acts themselves if they reported levels of prosocial cognitions greater than the overall mean of the sample. In contrast, the reported levels of prosocial cognitions in boys did not have a significant effect on the rate of committing violent acts. The scarcity of research regarding prosocial-supporting cognitions and the application of social information-processing models to prosocial behavior is a limitation of this research area.

**Online Decision Processes and Latent Mental Structures**

*Online decision processes and the response evaluation and decision heuristic.* Current social information-processing models of aggressive behavior (Crick & Dodge, 1994; Huesmann, 1998) posit that decisions in social situations are made through online cognitive processes. Thus, social information processing models are heuristics of online evaluation and decision processes. Online processes are mental operations that occur in real-time and are affected by the social situations and contexts currently experienced by the individual. These online processes are working representations of events as they are occurring and, as such, the effects of these operations are immediate and direct (Fontaine, 2007). Online decision processes are distinguished from latent (i.e., off-line or secondary) mental knowledge structures such as attitudes, beliefs, and values.

Online decision processes are activated when individuals consider how to respond to peers in specific situations as well as when individuals consider self-initiating behaviors (Fontaine, 2008). According to Dodge and Rabiner (2004), the study of online processes grew from foundations from cognitive sciences which examine *active* processes, such as attention, encoding, interpretation, and
evaluation, rather than passive processes such as understanding and knowledge. Because online processing is an active process, it is heavily dependent upon specific social stimuli, cues, and contexts and differs based on quality of the stimuli (e.g., whether an act of provocation is made by friend or unknown peer).

Online processing occurs rapidly and in parallel (i.e., individuals are engaged in multiple online processes simultaneously). However, current social information processing models of aggressive behavior posit that the path from a single stimulus to a particular behavior response follows a logical, linear sequence (Crick & Dodge, 1994). For example, in a conflict situation (e.g., a child being teased by a peer), an individual is engaged in a variety of online processes. He or she attends to and encodes information from the environmental context (e.g., tone of voice of the peer, events that proceeded the teasing). He or she also interprets the events (e.g., “Is the peer teasing playfully or attempting to provoke an angry reaction?”). The individual might also evaluate potential responses (e.g., “What would happen in this situation if I ignore the peer or respond with aggression?”). Although multiple processes are believed to occur simultaneously (e.g., the individual might evaluate potential responses while still encoding information from the environment), the path from attention and encoding of information related to a single stimulus, interpretation of the stimulus, and evaluation of potential responses to the stimulus is posited to follow a logical, sequential, pattern.

Fontaine and Dodge (2006) proposed that aggressive children are engaged in a multitude of online response evaluation and decision-making (RED) processes that determine the strength of their behavioral responses. The RED model provides a heuristic for understanding how individuals evaluate the variety of possible behavioral options generated in response to complex social cues and select the response option that will work best given the demands of the social context.
Although this conceptualization of RED processes is relatively new, initial results are promising. Longitudinal research has found that patterns of RED among adolescents predicted later anti-social conduct problems after prior conduct problems were controlled. In addition, anti-social conduct problems predicted later patterns of RED when prior RED was controlled (Fontaine et al., 2008).

During RED, individuals evaluate accessed or constructed scripts through five processes. These processes are as follows: (1) application of a threshold of acceptability; (2) response efficacy and response valuation; (3) outcome expectancy and outcome valuation; (4) response comparison; and (5) response selection. The utility and completeness of these processes vary depending on the demands of the social situation. To better understand RED as a comprehensive process, each individual process and its role in aggressive behavior will be discussed with particular emphasis on the processes examined in the present study (i.e., response efficacy, response valuation, outcome expectancy, outcome valuation, and response selection).

Process one: Application of a primary threshold of acceptability. During the response retrieval and generation steps of social information-processing models, individuals retrieve from their memory available problem-solving strategies by drawing upon schemas or scripts (Huesmann, 1988) or generate new strategies based on the demands of the situation (Crick & Dodge, 2004). After a schema or script is retrieved or generated, individuals then must assess the basic level of acceptability of the possible response.

Fontaine and Dodge (2006) define the Application of a Primary Threshold of Acceptability as a crude process in which individuals evaluate potential behaviors based on general relevance, situational applicability, and internal congruence criteria, and then compare their evaluation of the behavior to their acceptability threshold. The acceptability threshold level is based on the individual’s personal investment in the situation as well as the perceived importance of the
situation. In addition, the level of acceptability threshold depends upon the individual’s value of his or her behavior.

Response options that are more favorable than the acceptability threshold are further considered in later RED steps. Relatively unfavorable response options are transferred off-line to working memory for temporary storage. The application of a primary threshold of acceptability process is the crudest evaluative measure. Throughout the RED process, individuals continue to compare their potential behavioral options to increasingly stringent acceptability criteria. As such, it is likely that a response that passes the initial threshold of acceptability in Step One will be refuted in later RED steps.

Process two: response efficacy and valuation. Response efficacy. According to Bandura (1977; Bandura & Schunk, 1981), an individual’s ability to self-regulate his or her behavior depends on response efficacy (also referred to as self efficacy). Response efficacy is an individual’s belief that he or she can execute a specific behavior necessary to achieve a desired outcome (i.e., “How capable am I of performing this response?”; Fontaine & Dodge, 2006). Individuals who have confidence that they can successfully enact a behavior are more likely to engage in that behavior than individuals who do not believe they can successfully enact the behavior.

According to social information-processing models, children must feel confident (i.e., have efficacy) that they are able to engage in a behavior in order to later enact that response. It is believed that aggressive children feel more efficacious in their abilities to engage in aggressive behavior, and thus are more likely to engage in aggressive behavior compared to their non-aggressive peers. In contrast, aggressive children are believed to have lower response efficacy for inhibiting aggressive behaviors or using assertive, rather than aggressive, responses (Crick & Dodge, 1989; Cuddy, & Frame, 1991; Erdley, & Asher, 1996).
This hypothesis was examined by Perry et al. (1986) in fourth- through seventh-grade children. The authors found that aggressive children (as classified through a peer nomination process) were more likely to have efficacy for enacting aggressive behaviors and less efficacy for inhibiting aggressive behaviors compared to their non-aggressive peers ($r_s = .25$ for the relation between aggression status and both response efficacy for enacting aggressive behavior and response efficacy for inhibiting aggressive behavior). Quiggle et al. (1992) found similar results in a sample of third- to sixth-grade children. Compared to non-aggressive peers, aggressive children reported that they would be significantly more likely to use an aggressive response in peer provocation situations and that engaging in aggressive behavior would be easier for them ($r = .22$ for the relation aggression status and likelihood of aggressive response; $r = .25$ for the relation between aggression status and response efficacy for aggressive responses).

**Response valuation.** Response valuation (also referred to as response evaluation) is an individual’s moral and value judgment of the quality of social behaviors (Crick & Dodge, 1994). Response valuation is based upon normative beliefs (i.e., an individual's perceptions of “right” or “wrong” behaviors) and the value assigned to potential behaviors (i.e., “How much do I like this way of acting?”; Fontaine & Dodge, 2006).

Individuals who have positive valuations of a response (e.g., judge a response as right, good, kind, or friendly) are thought to be more likely to enact that response than individuals who have negative valuations of a response (Crick & Ladd, 1990). Valuation of responses is “means focused” (i.e., it is an appraisal of the behavior rather than the outcome; Fontaine & Dodge, 2006). According to social information-processing models, aggressive children are more likely to place positive valuations on aggressive responses than non-aggressive peers.
Asarnow and Callan (1985) examined the response valuations of fourth- and sixth-grade boys in response to peer provocation scenarios. Aggressive boys (as determined by a peer nomination process) rated aggressive responses more positively ($r = .35$ for the relation between aggression status and valuation of aggressive responses) and prosocial responses more negatively ($r = -.32$ for aggression status and valuation of prosocial responses) than non-aggressive boys. Crick and Ladd (1990) examined third- and sixth-grade students to examine how “nice or friendly” or “mean or unfriendly” children viewed aggressive and non-aggressive behavior strategies in response to hypothetical peer conflict scenarios. Rejected children (i.e., children deemed aggressive and disruptive by their peers) viewed physically and verbally aggressive strategies as more nice and friendly than their non-aggressive peers, but did not differ from peers in their valuations of prosocial strategies (e.g., compromise, appeal to the social norm, and polite requests).

**Process three: outcome expectancy and valuation.** *Outcome expectancy.* Outcome expectancies are the anticipated likelihoods that a specific outcome will result from a chosen behavior. Outcome expectancies influence the way individuals respond in social situations by creating expectations of future outcomes (Bandura, 1986). When an individual expects that a behavioral response will result in positive consequences that behavioral response is more likely to be enacted than others deemed not likely to result in positive outcomes. Behavioral responses that are expected to lead to negative consequences are more likely to be inhibited.

The relation between outcome expectancies and aggressive behavior in children has been examined thoroughly in social information-processing literature (Deluty, 1983). Based on social learning theory, the core tenet of this relation is that children who expect more favorable responses for aggressive behavior, in the form of tangible reward, adult approval, peer approval, self reward, reduction of aversive treatment, or victim suffering (Bandura 1973, 1979), are more likely to
engage in aggressive behavior than children who do not expect that positive outcomes will result. In addition, research suggests that aggressive children expect more favorable outcomes for aggressive behavior than non-aggressive children. For example, Perry et al. (1986) researched outcome expectancies in fourth- through seventh-grade children classified as aggressive or non-aggressive through a peer nomination process. Aggressive children were found to have more positive expectations for aggressive behavior in comparison to their non-aggressive peers ($r$ range from .18 for the relation between aggression status and outcome expectancy for tangible reward and .34 for aggression status and outcome expectancy for peer approval). This finding has been replicated in fourth- through twelfth-grade children and adolescents (Cuddy & Frame, 1991; Guerra & Slaby, 1989; Lochman & Dodge, 1994; Slaby & Guerra, 1998).

According to Fontaine and Dodge (2006), individuals in social situations assess outcome expectancies through the following questions: (1) “What good things will happen if I act this way?” (i.e., positive outcome expectancy); and (2) “What bad things will happen if I act this way?” (i.e., negative outcome expectancy). Possible responses in social situations must pass outcome expectancy thresholds in order to be further assessed and enacted. These outcome expectancy threshold levels are based upon the individual’s investment in the outcomes of a situation. That is, an individual who has a high level of concern regarding the potential outcomes of a situation will likely have a higher outcome expectancy threshold than an individual who is not as concerned with the potential outcomes of the situation.

**Outcome valuation.** In contrast to outcome expectancies, or estimates of the likelihood that a particular action will result in a specific consequence, outcome valuation is the value, or level of importance, that individuals place on anticipated outcomes. The higher the value that an individual assigns to the positive outcomes of a behavioral response, the more likely it is that the behavioral
response will be enacted. The higher the value that an individual assigns to the negative outcomes of response, the more likely that the response will be inhibited (Bandura, 1986). Fontaine and Dodge (2006) developed the following assessment questions for outcome valuations: (1) How much do I like the good things that will happen? (i.e., positive outcome valuation); and (2) How much do I dislike the bad things that will happen? (i.e., negative outcome valuation).

Outcome valuation is an important construct in predicting aggressive behavior. It is posited that even if an individual expects that a behavior will lead to a favorable outcome (i.e., the individual has a high positive outcome expectancy), the individual must also must also place value on the outcome in order to be sufficiently motivated to engage in aggressive behavior (Maddux, Norton, & Stoltenberg, 1986; Sexton, Tuckman, & Crehan, 1992). Boldizar, Perry, and Perry (1989) suggested that some children might have identical outcome expectancies for an aggressive behavior but children who place high value on the positive outcomes are more likely to engage in aggressive behavior than children who that place high value on the negative outcomes. Children who place high value on the positive outcome might engage in aggressive behaviors even for which they have low outcome expectancies.

To test these hypotheses, the authors examined the outcome valuations of third- to sixth-grade children categorized as aggressive or non-aggressive through a peer nomination process (Boldizar et al., 1989). Children completed a survey assessing the value assigned to one of six outcomes (i.e., tangible reward, control of victim, victim suffering, victim retaliation, peer rejection, and negative self evaluation) resulting from either verbal or physical aggression. Results indicated that aggressive and non-aggressive children differed in their outcome valuation for aggressive behaviors with aggressive children placing significantly more positive value on victim control ($r = .31$ for the relation between aggression status and valuation of victim control) and
significantly less negative value on victim suffering, victim retaliation, peer rejection, and negative self-evaluation than non-aggressive children (rs ranged from -.21 for the relation between aggression status and valuation of peer retaliation to -.32 for aggression status and valuation of victim suffering). That is, aggressive children cared more about the positive consequences and less about the negative consequences of aggressive behavior than non-aggressive children. These results were replicated in children ages 10- to 15-years old from a low social-economic status background by Hall, Herzberger, and Skowronski (1998).

Fontaine and Dodge (2006) posited that responses that are most likely to be selected have both high outcome expectancy and high outcome valuation. For example, a child might anticipate that pushing another child will result in increased peer status. However, if peer status is not valued by the child, it is unlikely that this option will be sufficiently motivating for the child to pursue.

Process four: response comparison. During response comparison, an individual evaluates the pool of remaining acceptable scripts and then determines which response option he or she will implement. According to Fontaine and Dodge (2006), competent processing would suggest that inept behavioral response options will either fail to pass the initial threshold of acceptability (i.e., Process One) or be judged as irrelevant and dismissed in the response efficacy/valuation (i.e., Process Two) or outcome expectancy/valuation (i.e., Process Three) stages. If multiple scripts pass these initial selection criteria, the value of each script must be compared to values of other surviving scripts to establish which script has the highest overall value.

Response comparison allows for the selection of the most favorable behavior from a pool of acceptable response options. During this process, Fontaine and Dodge (2006) posited that individuals assess potential response options based on the following assessment questions: (1) “Which way of acting am I best at?”; (2) “Which way of acting do I like best and approve of the
most?”; (3) “What is most likely to happen after I respond?” and (4) “Of all possible outcomes, which am I most hopeful will occur?”. The authors contended that response options that are considered most favorable according to RED heuristic are those for which an individual has high response efficacy and valuation, high positive outcome expectancies and valuation, and low negative outcome expectancies and valuations. The response option that is most favorably evaluated is hypothesized to be enacted (i.e., Process Five; response selection).

Process five: response selection. The final RED process is response selection. During response selection, individuals choose the response option that has been most positively evaluated during the previous RED processes (Fontaine et al., 2002; Fontaine & Dodge, 2006). That is, individuals assess which response is the “best” way to act in the situation. In order to be selected for enactment, the response option that has been most favorably must pass a final threshold of acceptability. This final threshold of acceptability is set based upon the individual’s investment in the situation, concern about the outcome of the situation, moral values, and situation-specific goals. For example, an individual who is deeply invested in a situation and the potential outcome, places high importance on moral values (e.g., fairness) and has specific goals for the situation would likely have a higher final acceptability threshold than an individual who places lower value on these constructs. If the response option fails to meet the final threshold of acceptability, the individual will either retrieve from memory additional scripts to be evaluated or lower his or her acceptability threshold. Once an individual selects the “best” response option, RED processes are complete and the individual proceeds to the sixth step of the social information-processing model, execution of the chosen response (Crick & Dodge, 2004). Fontaine and Dodge (2006) noted that children who are unable to successfully enact their selected behavior (e.g., a child with limited verbal skills who selects a verbally aggressive response) return to the RED process to select
another acceptable behavioral response option.

Research shows that selection of aggressive response options in response to hypothetical peer provocation scenarios is related to observed aggressive behavior. For example, adolescents who select aggressive response options in hypothetical peer provocation vignettes are more likely to be viewed by teachers and peers as more aggressive than adolescents who do not select aggressive response options (Bellmore, Witkow, Graham, & Juvonen, 2005). Fontaine et al. (2008) found significant relations between aggressive response selection in eighth-grade adolescents and both current externalizing behavior problems and later externalizing behavior problems in grades 10 and 12, even after prior behavior problems were controlled.

**Latent Mental Structures**

According to the RED heuristic, and social information-processing models in general, individuals generally do not make decisions based solely on the information presented in a specific situation (Crick & Dodge, 1994). Instead, individuals also access a “data-base” of stored knowledge to assist them in interpreting events and making decisions (Arsenio & Lemerise, 2004). This “data-base” consists of an individual’s latent mental structures.

Latent mental structures are comprised of mental representations of past experiences and events which are stored in the long-term memory and are integrated with children’s biological predispositions, personality traits (e.g., temperament), and capabilities (e.g., biological maturation). These latent mental structures include an individual’s understanding and knowledge of social rules, his or her attitudes, beliefs, and scripts (Huesmann & Eron, 1989), and values which comprise the individual’s social knowledge. There are various types of latent mental structures including cognitive heuristics and schematas which assist individuals in quickly interpreting large amounts of social information (Einhorn & Hogarth, 1981, as cited in Crick & Dodge, 1994) and influence
online processing of social cues. Compared to online processing, which is immediate and direct, the contributions of latent mental knowledge structures in decision making are secondary and indirect (Fontaine, 2008).

Differences among individuals’ abilities to effectively process information are thought to be grounded in different formations of latent mental structures. Latent mental structures that support aggressive cognitions are hypothesized to be formed in various ways, including through social learning (Bandura, 1973; 1977), hostile parenting styles (Heidgarken, Hughes, Cavell, & Willson (2004), and early exposure to maltreatment (Critendon & Ainsworth, 1989). Zelli, Cervone, and Huesmann (1996) posited that in addition to exposure to aggressive behavior, hostile interpretation of these events is needed for the formation of aggressive-supporting latent mental structures.

*Normative beliefs.* Normative beliefs are cognitions about the acceptability or unacceptability of a behavior (Huesmann & Guerra, 1997). Normative beliefs about aggression are posited to have a significant role in the development of aggressive behavior by assisting an individual in determining which behaviors will be performed and which behaviors will be inhibited (Huesmann & Reynolds, 2001). Huesmann and Guerra (1997) found that aggressive-supporting normative beliefs (i.e., beliefs that aggressive behavior is acceptable or legitimate) predicted aggressive behavior in fourth- and fifth-grade children. In addition, aggressive children have been found to hold higher levels of aggressive-supporting normative beliefs than non-aggressive children (Lochman & Dodge, 1994; Slaby & Guerra, 1988).

*Trait anger.* Another latent mental structure related to aggressive behavior is trait anger. Trait anger is the stable individual differences in the frequency, duration, and intensity of state anger (i.e., subjective feelings that range from annoyance to rage; Spielberger, 1988). Individuals with high levels of trait anger are more likely to engage in aggressive behavior, especially when
provoked, than individuals with low levels of trait anger (Berkowitz, 1993). These results have been replicated frequently in the literature (see Bettencourt, Talley, Benjamin, & Valentine, 2006 for a review).

**Persecution beliefs.** Persecution beliefs are an individual’s stable perceptions that others act towards them in a hostile way. Persecution beliefs, in part, comprise an individual’s hostile world schema or tendency to perceive hostility even when no hostility is present (Anderson & Huesmann, 2003). Persecution beliefs are posited to influence aggressive behavior by facilitating hostile attribution biases, or interpretation of events as hostile rather than benign. For example, Zelli and Huesmann (1993, as cited in Anderson & Huesmann, 2003) examined persecution beliefs in a college-age sample and found that individuals with higher levels of persecution beliefs perceived more hostility in social interactions than individuals with lower levels of persecution beliefs.

**Emotional regulation.** Emotional regulation has been defined as control and management of cognitive and affective arousal (Eisenberg & Fabes, 1992). Because intensity of emotion is related to aggressive behavior in children (Fabes & Eisenberg, 1992), it has been proposed that children who have difficulty managing emotions such as anger are more likely to engage in aggressive behaviors than children who have higher levels of emotional regulation. Research suggests that low levels of emotional regulation are related to high levels of aggressive behavior and low levels of prosocial behavior (Block & Block, 1980; Eisenberg, Fabes, & Nyman et al., 1994; Eisenberg et al., 1997).

**Relation Between Online Processing and Latent Mental Structures.**

Latent mental structures are not accessed during social information processing unless they are retrieved from an individual’s memory to be involved in online decision making (Fontaine, 2007). An individual with insufficient information to assess a social situation might access latent mental
structures in order to create a more complete representation of the social event. For example, Dodge and Rabiner (2004) suggest that when attempting to determine the intent of a peer in an ambiguous provocation scenario (i.e., online intent attribution), individuals activate from their latent mental structures beliefs about the general characteristics and behaviors of peers (e.g., whether peers generally “mean” or “friendly”) to supplement information provided in the specific social context. As such, latent mental structures are viewed as secondary to online processes and have an indirect effect on an individual’s information processing by influencing how the individual represents and categorizes social information in his or her long-term memory (Burks et al., 1999).

Burks et al. (1999) examined the relation between online social information processing and latent mental structures by assessing children’s responses to peer provocation, peer rejection, and authority confrontation vignettes (meant to assess online processes) and responses to sentence completion tasks and categorization of people and events as hostile or non-hostile (meant to assess aggressiveness and hostility in latent mental structures). Results suggested that children with hostile latent mental structures (e.g., children who responded to sentence completion tasks with aggressive responses and tended to categorize other people as “mean” rather than “friendly”) processed social information in a more hostile way than children without underlying hostile latent mental structures. In addition, both hostile online social information processing and hostile latent mental structures were positively related to externalizing behavior problems when considered separately. When examined together, only hostile latent mental structures significantly predicted externalizing behavior problems, suggesting that the significant relation between online processing and externalizing behavior might be accounted for by latent mental knowledge structures. However, the authors contended that online processing is important in the development of these latent mental structures which reinforce patterns of aggressive behavior.
Although research of this type has shown that an individual’s latent mental structures are related to the maintenance of aggressive behavior, examination of these knowledge structures has less usefulness in explaining how social cognitive processes immediately affect an individual’s decisions to engage in aggressive behavior in a given social situation (Fontaine, 2007). That is, research of this type has typically examined children’s observed or self-reported levels of aggressive behavior, which is likely to have multiple and varied antecedents, rather than their decision to engage in aggressive behavior in a particular social context. In addition, there has been a dearth of research suggesting how latent mental structures relate to prosocial behavior and prosocial information processing. The present study addressed these limitations.

The Present Study

The present study examined the relations among RED processing, latent mental structures, and aggressive and prosocial response selection. In this study, I addressed some of the limitations of previous research by positing that RED processes mediate the relation between latent mental structures and aggressive and prosocial response selection (i.e., latent mental structures predict an individual’s evaluation of potential responses in specific conflict situations, which in turn predict his or her decision to engage in aggressive or prosocial behavior). Response efficacy and response valuation for physically aggressive, verbally aggressive, and prosocial responses was assessed. Outcome expectancy and outcome valuation for reduction of aversive treatment, self reward, and peer approval for physical aggression, verbal aggression, and prosocial behavior was also measured. Finally, information regarding various latent mental structures (i.e., normative beliefs, persecution beliefs, trait anger, and emotional regulation) was examined.

The present study attempted to address several additional limitations in previous research. First, the present study focused on examining the relation between RED processes and latent
mental structures both in relation to aggressive and prosocial behaviors. The dearth of research regarding prosocial-related cognitions limits the current understanding of the information-processing of children who respond to conflict in a prosocial manner. Second, I proposed a specific model whereby RED processes mediate the relation between latent mental structures and response selection. Traditionally, research on these constructs has examined individual cognitive-to-behavior effects (i.e., the relation between response efficacy and aggressive behavior; the relation between normative beliefs and aggressive behavior) rather than the effects of patterns of information processing. In the present study, I addressed this limitation by positing that latent mental structures predict an individual’s evaluation of potential responses in specific conflict situations (i.e., RED processing), which in turn predict his or her selection of an aggressive or prosocial response.

Finally, the present study examined response selection of aggressive and prosocial behavior rather than observed or self-reported frequency of aggressive behavior. Although latent mental structures and response evaluation processes have been used to predict frequency of self-reported and observed aggressive behavior, there have been no studies that examine how the combination of latent mental structures and response evaluation processes relate to an individual’s decision to engage in aggressive behavior in a particular social context.

**Hypotheses**

There are four hypotheses addressed by this study:

1. In line with previous research, several demographic differences were predicted. First, boys will have higher levels of positive response efficacy and valuation and outcome expectancy and valuation for aggressive behavior response options than girls. Second, response efficacy and valuation and outcome expectancy and valuation for prosocial behavior response options will be higher for girls than for boys. Third, boys will report
higher levels of aggressive-supporting normative beliefs, persecution beliefs, and trait anger, and lower levels of emotional regulation than girls. Finally, boys will report higher levels of aggressive response selection than girls, whereas girls will report higher levels of prosocial response selection than boys. No race or grade differences were hypothesized.

2. Children with aggressive-supporting RED processes (i.e., high levels of response efficacy and valuation, and outcome expectancy and valuation for aggressive behavior response options) will display higher levels of aggressive response selection than children whose response evaluations processes are less aggressive-supporting. Children with prosocial-supporting RED processes (i.e., high levels of response efficacy and valuation, and outcome expectancy and valuation for prosocial behavior response options) will display higher levels of prosocial response selection than children whose RED processes more aggressive-supporting.

3. Children with aggressive-supporting latent mental structures (i.e., high levels of trait anger, persecution beliefs, aggressive-supporting normative beliefs, and low levels of emotional control) will display higher levels of aggressive response selection than children whose latent mental structures are less aggressive-supporting. Children with non-aggressive-supporting latent mental structures (i.e., low levels of trait anger, persecution beliefs, aggressive-supporting normative beliefs, and high levels of emotional regulation) will display higher levels of prosocial response selection than children whose latent mental structures are more aggressive-supporting.

4. RED processes (i.e., response efficacy and valuation and outcome expectancy and valuation) will mediate the relation between latent mental structures (i.e., normative
beliefs about aggressive behavior, trait anger, persecution beliefs, and emotional regulation) and response selection. It was expected that the relation between latent mental structures and response selection will be significantly reduced when RED processing variables are added as mediator variables.
METHOD

Participants

Participants for this study included students from sixth-, seventh-, and eighth-grade classrooms in two middle schools in rural Northwest Ohio. Classrooms were selected with cooperation from the middle school principals (e.g., one principal chose to have all classrooms in the school surveyed whereas one principal chose to survey select classrooms based on teachers’ availability and willingness to participate).

A waiver of parental consent, approved by the Human Subjects Review Board of Bowling Green State University, was obtained prior to participant recruitment. An informational letter describing the purpose and nature of the study was mailed to students’ parents and guardians. Parents and guardians who did not want their child to participate were asked to return the letter to their child’s teacher or to the researcher in a stamped business reply envelope enclosed with the information letter. A total of 249 information letters and waivers of parental consent were mailed. Of these letters mailed, 11 (4.42%) were returned indicating that the parent or guardian did not want his or her child to participate. Of the remaining 239 children with permission to complete the survey, 23 (9.6%) declined to participate or were absent the day of survey administration.

Data were collected from 215 students between the ages of 11- and 15-years old ($M = 12.96$ years). There were 109 boys (50.7%) and 101 girls (47.0%). Five children (2.3%) did not report their gender. The racial/ethnic makeup of the sample consisted of 117 Caucasian children (82.3%), 21 Hispanic children (9.8%), six Black or African-American children (2.8%), and three children who identified their background as “other” (1.4%). Eight children did not identify their race or ethnic background (3.5%).
Procedures

Testing procedures were explained to children by graduate student researchers or classroom teachers. Children were informed that their responses would remain anonymous and that no identifying information would be collected. Researchers and teachers read all survey questions and responses aloud. Completion of the survey took approximately 35 minutes. Children were given a small reward (i.e., candy) after completing the survey.

Measures

Children’s RED processes were measured through their responses to three hypothetical peer conflict vignettes (vignettes are presented in Appendix A). The vignettes assessed children’s response efficacy, response valuation, outcome expectancy, outcome valuation, and response selection for physically aggressive, verbally aggressive, and prosocial behavioral response options.

Response Evaluation and Decision (RED) Processes

Response efficacy. Response efficacy (i.e., the child’s belief that he or she can execute a specific behavior necessary to achieve a desired outcome) was measured using nine items adapted from Wheeler and Ladd (1982). In each of the three vignettes, one item assessed response efficacy for a physically aggressive behavioral response (e.g., “How hard would it be for you to push the kid who is picking on you?”), one item assessed response efficacy for a verbally aggressive response (e.g., “How hard would it be for you to yell at the kid who is picking on you?”), and one item assessed response efficacy for a prosocial response (e.g., “How hard would it be for you try and work things out calmly with the kid who is picking on you?”). Ratings were made on a 4-point scale ranging from 1 ("Really hard") to 4 ("Really easy"). Similar items used by Perry et al. (1986) have demonstrated moderate levels of internal consistency (i.e., α = .86 for efficacy for aggressive behavior; α = .67 for efficacy for prosocial behavior). Separate scaled scores were
calculated from the mean of physically aggressive behavior items, the mean of verbally aggressive behavior items, and the mean of prosocial behavior items to obtain composite scores for response efficacy for physical aggressive behavior, verbal aggressive behavior, and prosocial behavior, with higher scores indicating greater response efficacy. Internal consistency for these scales was .81 for efficacy for physical aggressive behavior, .72 for efficacy for verbal aggressive behavior, and .81 for efficacy prosocial behavior. Response efficacy items are presented in Appendix B.

Response valuation. Response valuation (i.e., the child’s moral and value judgments of the quality of social behaviors) was measured using nine items adapted from a format suggested by Fontaine and Dodge (2006). In each of the three vignettes, one item assessed response valuation for a physically aggressive behavior response (e.g., “How much would you like to push the kid who is picking on you?”), one item assessed response valuation for a verbally aggressive response (e.g., “How much would you like to yell at the kid who is picking on you?”), and one item assessed response valuation for a prosocial response (e.g., “How much would you like to try and work things out calmly with the kid who is picking on you?”). Ratings were made on a 4-point scale ranging from 1 (“Not at all”) to 4 (“A lot”). Item responses were averaged to create scaled scores for response valuation for physical aggression, response valuation for verbal aggression, and response valuation for prosocial behavior with higher scores indicating greater positive valuation. Scales achieved internal consistencies of .81, .77, and .85 for valuation of physical aggressive behavior, verbal aggressive behavior, and prosocial behavior, respectively. Response valuation items are presented in Appendix C.

Outcome expectancy. Outcome expectancy (i.e., the child’s anticipated likelihoods that a specific outcome will result from a chosen behavior) was measured using items adapted from the Outcome Expectations Questionnaire (OEQ) for aggressive and prosocial behavior (Perry et al.,
The OEQ includes 48 items assessing children’s levels of confidence that a specific outcome will occur after they perform an aggressive behavior or prosocial behavior directed towards another child. The OEQ was adapted to address the specific goals of the present study. Following the format of the OEQ, children rated their level of confidence that a physically aggressive, verbally aggressive, or prosocial behavior would result in one of the three targeted outcomes (i.e., reduction of aversive treatment, self reward, and peer approval). Ratings of children’s level of confidence were made on a 4-point scale from 1 ("Not at all") to 4 ("A lot"). Perry, Perry and Rasmussen (1986) reported alpha coefficients for aggressive behavior subscales measuring expectations of tangible reward, peer approval, and self-reward as .61, .67, and .61, respectively.

Items on this scale included expectancies for a variety of behaviors that encompass physical aggression (e.g., hitting, pushing, shoving), verbal aggression (e.g., yelling, saying mean thing, name calling), and prosocial behavior (e.g., trying to work things out calmly). An equal number of physical aggression, verbal aggression, and prosocial items were included for each expectancy type assessed (i.e., reduction of aversive treatment, self reward, and peer approval were assessed for three physically aggressive behaviors, three verbally aggressive behaviors, and three prosocial behaviors). In total, there were nine items assessing children’s expectations for reduction of aversive treatment, nine items assessing expectation for self reward, and nine items assessing peer approval.

Separate scaled scores were calculated from the mean responses of physically aggressive response items, verbally aggressive response items, and prosocial response items for each of the targeted outcomes of reduction of aversive treatment, self reward, and peer approval, with higher scores indicating greater expectancy. The internal consistencies for the three scales assessing
outcome expectancies for physical aggressive behavior were: .78 (reduction of aversive treatment), .80 (self reward), and .81 (peer approval). Reliability for verbal aggressive behavior subscales measuring expectations of tangible reward, self reward, and peer approval was .75, .74, and .78, respectively. For prosocial behavior, reliability for the reduction of aversive treatment scale was .73, reliability for the self reward scale was .91, and reliability for the peer approval scale was .80. Items on the Outcome expectancy scales are presented in Appendix D.

Outcome valuation. Outcome valuation (i.e., the value, or level of importance, that the child places on anticipated outcomes) was measured using nine items adapted from a format suggested by Fontaine and Dodge (2006). In each of the three vignettes, one item assessed outcome valuation for reduction of aversive treatment (e.g., “How important is it to you that the kid stops tripping you in this situation?”), one item assessed valuation for self reward (e.g., “How important is it to you to feel good about yourself in this situation?”), and one item assessed valuation for peer approval (e.g., “How important is it to you that your classmates like what you do in this situation?”). Ratings of valuation were made on a 4-point scale ranging from 1 (“Not at all”) to 4 (“A lot”). Item responses were averaged to create scaled scores for outcome valuation for reduction of aversive treatment, outcome valuation for self reward, and outcome valuation for peer approval, with higher scores indicating greater levels of positive valuation. The internal consistencies for the three scales assessing outcome valuation were .70 (reduction of aversive treatment), .82 (self reward), and .83 (peer approval). Outcome valuation items are presented in Appendix E.

Response selection. Response selection was assessed by asking children to rate their levels of confidence that they would engage in physical aggression, verbal aggression, and prosocial behavior in each hypothetical peer conflict vignettes (e.g., “Would you hit the kid?”; “Would you
try to work things out calmly with the kid?”). Ratings of response selection were made on a 4-point scale ranging from 1 ("Very sure I wouldn’t") to 4 ("Very sure I would"). Item responses were averaged to create scaled scores for response selection for physical aggressive behaviors, response selection for verbal aggressive behaviors, and response selection for prosocial behaviors with higher scores indicating higher levels of confidence that the child would select the behavior in a conflict situation. The internal consistencies for the three scales assessing response selection were .86, .80, and .85 for physical aggressive behaviors, verbal aggressive behaviors, and prosocial behavior, respectively. Items on the response selection scales are presented in Appendix F.

**Latent Mental Structures**

*Normative beliefs about aggression.* Children’s normative beliefs about aggressive behavior were measured using the General Beliefs subscale of the Normative Beliefs About Aggression Scale (NOBAGS; Huesmann & Guerra, 1997). The General Beliefs subscale of the NOBAGS consists of eight self-report items that assess the general acceptability or unacceptability of aggressive behavior (e.g., “If you’re angry, it is OK to say mean things about other people.”). Ratings were made on a 4-point scale ranging from 1 ("Never") to 4 ("Always"). Responses on the NOBAGS were averaged to create a scaled score for normative beliefs about aggressive behavior with higher scores indicating greater acceptance of general aggressive behavior. The General Beliefs subscale has demonstrated high levels of reliability (i.e., α = .91 for children ages 8- to 12-years old; Boxer et al., 2003) and demonstrated an internal consistency of .81 in the present study. Items on the General Beliefs subscale are presented in Appendix G.

*Trait anger.* Trait anger was measured using the Trait Anger scale of the State-Trait Anger Expression Inventory for Children and Adolescents (STAXI-CA; del Barrio, Aluja, & Spielberger, 2004). The STAXI-CA is a youth version of the widely-used State-Trait Anger Expression
Inventory (STAXI-2; Spielberger et al., 1985) and assesses the experience, expression, and control of anger. The Trait Anger scale of the STAXI-CA consists of a four-item Angry Temperament subscale assessing frequency of unprovoked anger (e.g., “I get angry very quickly”) and a four-item Angry Reactions subscale assessing frequency of perceived provoked anger (e.g., “I get angry when I have to wait because of others’ mistakes”). Responses to items are made on a 3-point scale ranging from 1 (“Hardly Ever”) to 3 (“Often”). The Trait Anger subscales of the STAXI-CA have demonstrated moderate reliability (i.e., $\alpha = .71$ for Total Trait Anger; del Barrio et al., 2004). Three items on the Trait Anger scale were reworded to be easier for sixth- through eighth-grade children to understand (e.g., “I fly off the handle” was reworded to “I lose my temper easily”). Responses were averaged to create a scaled score for Trait Anger with higher scores indicating greater trait anger. The reliability of the Trait Anger scale was .82. Items on the Trait Anger scale are presented in Appendix H.

*Emotional regulation.* Emotional regulation was assessed using the Regulation subscale of the Emotional Regulation Scale modified from scales developed by Eisenberg (Eisenberg et al., 1994; Eisenberg et al., 1997). The Emotional Regulation Scale consists of 19 self-report items assessing attention, impulsivity, regulation intensity, and sensation seeking. The Regulation subscale used in the present study consisted of four items that assess expression and management of cognitive and affective arousal (e.g., “When you get upset or excited, you get VERY upset or excited”). Responses to items were made on a 3-point scale ranging from 1 (“Not at all true of you”) to 3 (“Very true of you”). Responses were averaged to create scaled scores for emotional regulation with higher scores indicating greater levels of emotional regulation. The Regulation subscale of the Emotional Regulation Scale has demonstrated moderate reliability (i.e., $\alpha = .72$; Huesmann, Dubow & Boxer, 2002) and achieved a reliability of .52 in the present study. Items on
the Regulation subscale are presented in Appendix I.

*Persecution beliefs.* Persecution beliefs were assessed using seven items from the Hostile Word Beliefs Scale (Zelli, 1992) which assesses the extent to which children perceive others’ acts towards them in a hostile way (e.g., “People get angry at me more than they do at others.”). Responses to items were made on a 4-point scale ranging from 1 (“Never”) to 4 (“A lot”). The Persecution Beliefs Scale has demonstrated moderate reliability (i.e., $\alpha = .85$) for children ages eight- to twelve-years old (Huesmann et al., 2002). Responses were averaged to create a scaled score for Persecution Beliefs with higher scores indicating greater levels of persecution beliefs. The Persecution Beliefs scale obtained a reliability of .92. Scale items are presented in Appendix J.
RESULTS

Preliminary Analyses

Data reduction. Means and standard deviations for the latent mental structure variables (i.e., normative beliefs, persecution beliefs, emotional regulation, and trait anger) are presented in Table 1. The results show that aggressive-supporting normative beliefs (\(\bar{x} = 1.92; SD = .66; 1 = \text{Never}, 2 = \text{Sometimes}, 3 = \text{Usually}, \text{and} 4 = \text{Always}\)) and persecution beliefs (\(\bar{x} = 2.06; SD = .82; 1 = \text{Never}, 2 = \text{Hardly Ever}, 3 = \text{Sometimes}, \text{and} 4 = \text{A Lot}\)) were relatively low in the sample. Children reported moderate levels of trait anger (\(\bar{x} = 1.86; SD = .51; 1 = \text{Hardly Ever}, 2 = \text{Sometimes}, 3 = \text{Often}\)) and emotional regulation (\(x = 1.82, SD = .45; 1 = \text{Not at all True of You}, 2 = \text{Somewhat True of You}, 3 = \text{Very True of You}\)). Correlations were computed among latent mental structure scales to determine if there was sufficient overlap to permit consolidation (Table 2). Emotional regulation and trait anger were correlated at -.53. Due to conceptual and item similarity, emotional regulation was reverse coded so that higher scores indicated lower levels of regulation. These variables were then standardized and averaged to create a scaled score for Angry Emotions. The Angry Emotions scale achieved an internal consistency of .83.

The means and standard deviations for the response selection variables are presented in Table 3. Response selection was lowest for prosocial behaviors (\(\bar{x} = 2.49; SD = .96; 1 = \text{Very Sure I Wouldn’t}, 2 = \text{Pretty Sure I Wouldn’t}, 3 = \text{Pretty Sure I Would}, 4 = \text{Very Sure I Would}\)) and highest for verbally aggressive behaviors (\(\bar{x} = 2.71; SD = .88\)). Response selection for physical aggressive behavior and verbal aggressive behaviors was correlated at .71, so these scales were averaged to create a Response Selection for Aggressive Behavior Scale. This scale achieved an internal consistency of .91.

Means and standard deviations for the RED processing variables (i.e., response efficacy,
Response efficacy was highest for verbal aggressive behavior ($\bar{x} = 3.08; SD = .80; 1 = \text{Really Hard, } 2 = \text{Sort of Hard, } 3 = \text{Sort of Easy, and } 4 = \text{Really Easy}$) and lowest for prosocial behavior ($\bar{x} = 2.34; SD = .88$). Response valuation was highest for verbal aggressive behavior ($\bar{x} =2.88; SD = .85; 1 = \text{Not at All, } 2 = \text{A Little, } 3 = \text{Quite a Bit, and } 4 = \text{A Lot}$) and lowest for physical aggressive behavior ($\bar{x} = 1.93; SD = .88$). Repeated measure ANOVAs revealed differences among children’s outcome expectancies for physical aggressive behaviors ($F(2,212) = 3.13, p < .05$). Children had significantly higher expectations that physical aggressive behavior would lead to peer approval ($\bar{x} = 2.29; SD = .91; 1 = \text{Not at All, } 2 = \text{A Little, } 3 = \text{Quite a Bit, and } 4 = \text{A Lot}$) compared to reduction of aversive treatment ($\bar{x} = 2.15; SD = .86$). Children also had significantly different outcome expectations for verbal aggressive behaviors ($F(2,212) = 6.54, p < .01$) with higher expectancies that verbal aggressive behavior would lead to self reward ($\bar{x} = 2.16; SD = .84$, and peer approval ($\bar{x} = 2.14; SD = .84$) compared to reduction of aversive treatment ($\bar{x} = 1.98; SD = .77$). There were also significant differences among children’s outcome expectancies for prosocial behaviors ($F(2,212) = 27.60, p < .01$) with children having lower expectations that prosocial behavior would lead to reduction of aversive treatment ($\bar{x} = 2.15; SD = .80$) compared to self reward ($\bar{x} = 2.57; SD = .92$) and peer approval ($\bar{x} = 2.48; SD = .92$). Children placed the highest value on reduction of aversive treatment outcome ($\bar{x} = 3.26; SD = .72; 1 = \text{Not at All, } 2 = \text{A Little, } 3 = \text{Quite a Bit, and } 4 = \text{A Lot}$) and the lowest value on the peer approval outcome ($\bar{x} = 2.47; SD = .98$).

Correlations were computed among the RED processing variable scale scores to determine whether these variables could be consolidated into a Response Evaluation variable and an Outcome Evaluation variable. Results of correlations among response efficacy and response valuation variables ranged from $.69$ to $.72$ and are presented in Table 4. Results from correlations between
the outcome expectancy and outcome valuation variables ranged from .02 to .43 and are presented in Table 5. Based on the theoretical conceptualization of the RED model as outlined by Fontaine and Dodge (2006), the variables were consolidated as described below.

*Creating composite RED variable scores.* Fontaine and Dodge (2006) posited that during Process Two of RED, individuals compare the strength of various behavioral response options by assigning each potential response a score between 0 and some set number. These scores are based on the individual’s estimated response efficacy (i.e., how much the individual believes he or she is capable of enacting the response) and response valuation (i.e., how much the individual would like to enact the response) for each option. The individual then performs a mental calculation akin to multiplying the response efficacy and response valuation scores to create a Response Evaluation score for each response option considered. In order to have a high Response Evaluation score, a response must have both high response efficacy and response valuation. If an individual has no response efficacy or no response valuation for a particular response option, the Response Evaluation score will be zero. Responses with higher Response Evaluation score are more likely to be considered for enactment than responses with a lower Response Evaluation score.

To create this Response Evaluation score in the present study, participants’ response efficacy ratings were multiplied by their corresponding response valuation ratings for each behavioral response (i.e., physical aggressive behavior, verbal aggressive behavior, prosocial behavior) within the three vignettes. Scaled scores were then computed based on the mean of the products of response efficacy and response valuation for physical aggressive behaviors, the mean of the products of response efficacy and response valuation for verbal aggressive behaviors, and the mean of the products of response efficacy and response valuation for prosocial behaviors across vignettes. For example, the product of a participant’s response efficacy and response valuation for
physical aggressive behavior were computed separately for each of the vignettes. These three product scores were then averaged to create a Response Evaluation for Physical Aggressive Behavior scaled score. Likewise, the products of response efficacy and valuation for verbal aggressive behavior and the products of response efficacy and valuation for prosocial behavior were averaged across vignettes to create Response Evaluation for Verbal Aggressive Behavior and Response Evaluation for Prosocial Behavior scaled scores.

Internal consistencies for these scales were .86 for Response Evaluation for Physical Aggressive Behavior, .80 for Response Evaluation for Verbal Aggressive Behavior, and .85 for Response Evaluation for Prosocial Behavior. Means and standard deviations for Response Evaluation scores are presented in Table 6. Results show that Response Evaluation scores were lowest for prosocial behavior ($\bar{x} = 6.33, SD = 4.09$ with possible scores ranging from 1 to 16) and highest for verbal aggressive behaviors ($\bar{x} = 9.51, SD = 4.36$). Scores for Response Evaluation for physical aggressive behavior and verbal aggressive behavior were correlated at .74 and were thus combined to create a Response Evaluation for Aggressive Behavior scaled score. This scale achieved an internal consistency of .89.

Fontaine and Dodge (2006) also posited that in Process Three of RED, individuals compare the strength of various behavioral response options based also on their estimated levels of outcome expectancy (i.e., the degree to which the individual believes the behavioral response will lead to a particular outcome) and outcome valuation (i.e., the value placed on a particular outcome). Similar to Process Two of RED, individuals assign each response option a score between 0 and some set number through a mental calculation in which outcome expectancy is multiplied by outcome valuation for each behavioral response. The resulting Outcome Evaluation score is then used to consider which response is most likely to lead to the most valued outcome. Responses with a
higher Outcome Evaluation score are more likely to be considered for enactment than responses with a lower Outcome Evaluation score.

In the present study, participants’ ratings of their expectancy that physical aggressive behavior would lead to reduction of aversive treatment, self reward, and peer approval were multiplied by their respective outcome valuation ratings (e.g., a participant’s outcome expectancy that physical aggressive behavior would lead to a reduction of aversive treatment in a specific vignette was multiplied by their valuation of reduction of aversive treatment in the same vignette). The three separate product scores were then averaged across vignettes to create a scaled score for Outcome Evaluation for Reduction of Aversive Treatment from Physical Aggressive Behavior. Likewise, the products of outcome expectancy and valuation for self reward from physical aggressive behavior, and the products of outcome expectancy and valuation for peer approval from physical aggressive behavior were averaged to create an Outcome Evaluation for Self Reward from Physical Aggressive Behavior scale and an Outcome Evaluation for Peer Approval from Physical Aggressive Behavior, respectively. This process was repeated for verbal aggressive behaviors and prosocial behaviors so that Outcome Evaluation for Reduction of Aversive Treatment, Outcome Evaluation for Self Reward, and Outcome Evaluation for Peer Approval scaled scores were created for both verbal aggressive behaviors and prosocial behaviors.

Internal consistency for these scales was adequate (αs ranged from .72 to .75 for Reduction of Aversive Treatment; from .77 to .86 for Self Reward; and from .77 to .85 for Peer Approval). Means and standard deviations of Outcome Evaluation scales are presented in Table 6. Outcome Evaluation scores were lowest for peer approval from verbal aggressive behavior ($\bar{x} = 5.29, SD = 3.12$ with possible scores ranging from 1 to 16) and highest for self reward from prosocial behavior ($\bar{x} = 8.07, SD = 4.29$). Correlations of Outcome Evaluation variables are presented in Table 7.
Outcome Evaluation for Reduction of Aversive Treatment, Outcome Evaluation for Self Reward, and Outcome Evaluation for Peer Approval from physical and verbal aggressive behavior were correlated at .62, .81, and .81, respectively. Thus, scores were combined to create Outcome Evaluation for Reduction of Aversive Treatment from Aggressive Behavior, Outcome Evaluation for Self Reward from Aggressive Behavior, and Outcome Evaluation for Peer Approval from Aggressive Behavior scaled scores. Due to intercorrelation among these scales and Fontaine and Dodge’s (2006) conceptualization of an Outcome Evaluation score, these scales were averaged to create an Outcome Evaluation for Aggressive Behavior scaled score which achieved an internal consistency of .88. Outcome Evaluation for Reduction of Aversive Treatment, Self Reward, and Peer Approval from Prosocial Behavior were also averaged to create an Outcome Evaluation for Prosocial Behavior scaled score that achieved internal consistency of .75.

Determining demographic control variables. MANOVAs were computed for the RED variables and latent mental structure variables to determine if there were any demographic variables that would need to be statistically controlled in later analyses. The results of this analysis are presented in Tables 8 and 9. As there were several hypothesized sex differences proposed in this study, significant effects for sex are discussed in detail in the major analyses section of Hypothesis One below. There were no significant multivariate effects for grade. There was a multivariate effect for race regarding Outcome Evaluation \((F(1,96) = 4.77, p < .05)\). Univariate ANOVAs revealed that non-white students had higher Outcome Evaluation for aggressive behavior compared to white students \((F(1,96) = 9.00, p < .01)\). Non-white students also reported higher levels of Angry Emotions compared to white students \((F(1,96) = 5.76, p < .05)\). There were two multivariate effects for school including Response Evaluation \((F(1,96) = 4.91, p < .01)\) and Response Selection \((F(1,96) = 4.70, p < .01)\). Schools differed in levels of Response Evaluation for aggressive
behaviors \((F(1,96) = 9.64, p < .01)\) but not prosocial behavior. Response Selection differed between schools for both aggressive behaviors \((F(1,96) = 8.49, p < .01)\) and prosocial behaviors \((F(1,96) = 6.41, p < .05)\). Because of significant effects on response selection, school was controlled in later analyses.

**Major Analyses**

*Hypothesis one:* The first hypothesis examined sex differences in predictor and outcome variables. It was expected that boys would report higher levels of response efficacy and response valuation (i.e., Response Evaluation) and outcome expectancy and outcome valuation (i.e., Outcome Evaluation) for aggressive behavioral response options than girls. Conversely, it was expected that Response Evaluation and Outcome Evaluation for prosocial behavior response options would be higher for girls than for boys. Hypothesis One also posited that boys would report higher levels of aggressive-supporting latent mental structures than girls. Finally, it was hypothesized that boys would report higher levels of aggressive response selection than girls, whereas girls would report higher levels of prosocial response selection than boys.

The MANOVAs computed to determine demographic differences were also used to examine sex differences for Response Evaluation and Outcome Evaluation (Table 8). There was a significant multivariate effect for sex on Response Evaluation \((F(1,96) = 10.64, p < .01)\). Supporting the hypothesis, univariate ANOVAs showed that boys reported higher levels of Response Evaluation for aggressive behavior than girls \((F(1,96) = 15.93, p < .01)\), whereas girls reported higher levels of Response Evaluation for prosocial behavior than boys \((F(1,96) = 15.03, p < .01)\).

There were also a significant multivariate effect for sex on Outcome Evaluation \((F(1,96) = 9.20, p < .01)\). Surprisingly, there were no significant differences between boys’ and girls’ Outcome
Evaluation scores for aggressive behavior. Univariate ANOVAs showed that girls had more positive Outcome Evaluation for prosocial behaviors than boys ($F(1,96) = 10.80, p < .01$).

Additionally, there was a significant multivariate effect for Response Selection ($F(1,96) = 13.23, p < .01$). Univariate ANOVAs showed that boys selected aggressive responses at a higher rate than girls ($F(1,96) = 24.15, p < .01$), whereas girls selected prosocial responses at a higher rate than boys ($F(1,96) = 17.62, p < .01$).

Finally, boys reported significantly higher levels of aggressive-supporting latent mental knowledge structures than girls. Univariate ANOVAs showed that boys had higher levels of aggressive-supporting normative beliefs ($F(1,96) = 13.98, p < .01$), higher levels of persecution beliefs ($F(1,96) = 3.88, p < .05$), and higher levels of angry emotions ($F(1,96) = 4.80, p < .05$), compared to girls. Because of significant effects on response selection, sex was controlled in later analyses.

Hypothesis two: The second hypothesis examined the relation between RED processes and response selection. It was expected that children with aggressive-supporting RED processes (i.e., high levels Response Evaluation and Outcome Evaluation for Aggressive Behavior) would display higher levels of aggressive response selection than children whose RED processes were less aggressive-supporting. Children with lower levels Response Evaluation and Outcome Evaluation for Aggressive Behavior would display higher levels of prosocial response selection than children whose RED processes were more aggressive-supporting.

A hierarchical regression was computed whereby sex and school were entered in the first step, followed by Response Evaluation and Outcome Evaluation for Aggressive Behavior variables in the second step to predict aggressive response selection. Results (presented in Table 10) show that aggressive-supporting response evaluation processes did predict aggressive Response Selection
Response Selection 47

(F(2,203) = 247.76, p < .01). Step One showed that sex and school accounted for 14% of the variance in predicting Aggressive Response Selection. Step Two accounted for a significant increment in predicting Aggressive Response Selection (i.e., an additional 60%). Both Response Evaluation and Outcome Evaluation for Aggressive Behavior were positively related to Response Selection for Aggressive Behavior after controlling for sex and school (β = .78, p < .01 for Response Evaluation; β = .09, p < .05 for Outcome Evaluation).

Hypothesis Two also stated that children with prosocial-supporting RED processes would display higher levels of prosocial response selection than children whose RED processes were more aggressive-supporting. Results of hierarchical regressions (presented in Table 11) show that prosocial-supporting RED processes predicted prosocial response section (F(2,203) = 79.50, p < .01). Step One showed that sex and school accounted for 10% of the variance in predicting Prosocial Response Selection. Step Two accounted for an additional 50% of the variance in predicting Prosocial Response Selection. Both Response Evaluation and Outcome Evaluation for Prosocial Behavior were positively related to Response Selection for Prosocial Behavior after controlling for sex and school (β = .62, p < .01 for Response Evaluation; β = .16, p < .01 for Outcome Evaluation).

Hypothesis three: The third hypothesis examined the relation between latent mental structures and response selection. It was expected that children with aggressive-supporting latent mental structures (i.e., high levels of trait anger, persecution beliefs, and angry emotions) would display higher levels of aggressive response selection than children whose latent mental structures were less aggressive-supporting. Children with non-aggressive-supporting latent mental structures (i.e., low levels of trait anger, persecution beliefs, and angry emotions) would display higher levels of prosocial response selection than children whose latent mental structures were more aggressive-
Hierarchical regressions were computed whereby sex and school were entered in the first step, followed by Normative Beliefs, Persecution Beliefs, and Angry Emotions in the second step to predict Aggressive Response Selection and Prosocial Response Selection. Results presented in Table 12 show that in Step One sex and school accounted for 10% to 14% of the variance in predicting Aggressive Response Selection and Prosocial Response Selection. Step Two accounted for significant increments in variance in predicting Aggressive Response Selection (and additional 32%) and Prosocial Response Selection (an additional 26%). Normative Beliefs and Angry Emotions were significant predictors of both Aggressive Response Selection and Prosocial Response Selection after controlling for sex and school. Higher levels of aggressive-supporting Normative Beliefs and Angry Emotions predicted higher levels of Aggressive Response Selection, whereas lower levels of aggressive-supporting Normative Beliefs and Angry Emotions predicted higher levels of Prosocial Response Selection.

*Hypothesis four:* The fourth hypothesis posited that RED processes (i.e., Response Evaluation and Outcome Evaluation) would mediate the relation between latent mental structures (i.e., Normative Beliefs, Persecution Beliefs, and Angry Emotions) and the response selection variables. Here, the notion is that children’s latent mental structures influence their evaluation of potential behavior responses in a specific social situation (e.g., children with aggressive-supporting latent mental structures are more likely to favorably evaluate aggressive responses and their potential outcomes). RED processes would, in turn, be related to selection of an aggressive or prosocial response. It was expected that the relation between latent mental structures and response selection would be significantly reduced when RED processing variables were added as mediator variables.
This potential mediating effect on aggressive response selection was analyzed using the method developed by Baron and Kenny (1986). Following this method, three steps were followed to determine if Response Evaluation and Outcome Evaluation for Aggressive Behavior mediated the relation between the latent mental structure predictor variables and the outcome variable (i.e., Response Selection for Aggressive Behavior). In step one, Response Selection for Aggressive Behavior was regressed on significant demographic variables (i.e., sex and school). In step two, Response Selection for Aggressive Behavior was regressed on sex, school, and the latent mental structure predictor variables (i.e., Normative Beliefs, Persecution Beliefs, and Angry Emotions). In step three, Response Selection for Aggressive Behavior was regressed on sex and school, the latent mental structure predictor variables, and the Response Evaluation and Outcome Evaluation for Aggressive Behavior mediator variables. If partial mediation occurs, the relation between latent mental structures and Response Selection for Aggressive Behavior would be significantly reduced when Response Evaluation and Outcome Evaluation for Aggressive Behavior variables were added as mediator variables.

Response Evaluation and Outcome Evaluation for Aggressive Behavior were found to partially mediate the relation between latent mental structures and Response Selection for Aggressive Behavior after controlling for sex and school (see Table 13). In the first step, sex and school were found to be positively associated with Response Selection for Aggressive Behavior ($\beta = .31, p < .01$ for sex; $\beta = .20, p < .01$ for school). In the second step, the predictor variables of Normative Beliefs and Angry Emotions were found to be positively associated with Response Selection for Aggressive Behavior after controlling for sex and school ($\beta = .44, p < .01$ for Normative Beliefs; $\beta = .28, p < .01$ for Angry Emotions). In the third step, both Response Evaluation and Outcome Evaluation for Aggressive Behavior were positively related to Response
Response Selection for Aggressive Behavior after controlling for sex, school, and the latent mental structure predictor variables ($\beta = .67, p < .01$ for Response Evaluation; $\beta = .09, p < .05$ for Outcome Evaluation). When the mediator variables were added, the strength of the relation between Angry Emotions and Response Selection for Aggressive Behavior was no longer significant ($\beta = .04, p < .42$). The strength of the relation between Normative Beliefs and Response Selection for Aggressive Behavior was still significant but reduced ($\beta = .18, p < .01$). Using a procedure developed by Preacher and Hayes (2008) to estimate indirect effects in multiple mediator models, Sobel tests (Sobel, 1982) were computed in order to test the strength of the reduction when the mediator variables were included. Response Evaluation and Outcome Evaluation for Aggressive Behavior were found to partially mediate the relation between Normative Beliefs and Response Selection for Aggressive Behavior ($Z = 7.84, p < .01$ for Response Evaluation; $Z = 1.77, p < .10$ for Outcome Evaluation). Response Evaluation and Outcome Evaluation for Aggressive Behavior were found also to partially mediate the relation between Angry Emotions and Response Selection for Aggressive Behavior ($Z = 7.08, p < .01$ for Response Evaluation; $Z = 1.83, p < .10$ for Outcome Evaluation).

A similar set of analyses was used to examine the mediating effects of RED processes on the relation between latent mental structures and Response Selection for Prosocial Behavior (see Table 14). In the first step, Response Selection for Prosocial Behavior was regressed on sex and school. Both variables were found to be significantly associated with Response Selection for Prosocial Behavior ($\beta = -.26, p < .01$ for sex; $\beta = -.18, p < .01$ for school). In step two, Response Selection for Prosocial Behavior was regressed on sex, school, and the latent mental structure predictor variables. The predictor variables of Normative Beliefs, Persecution Beliefs, and Angry Emotions were found to be significantly associated with Response Selection for Prosocial Behavior.
after controlling for sex and school ($\beta = -.37, p < .01$ for Normative Beliefs; $\beta = .12, p < .05$ for Persecution Beliefs; $\beta = -.29, p < .01$ for Angry Emotions). In step three, Response Selection for Prosocial Behavior was regressed on sex and school, the latent mental structure predictor variables, and the Response Evaluation and Outcome Evaluation for Prosocial Behavior mediator variables. Response Evaluation and Outcome Evaluation for Prosocial Behavior was found to partially mediate the relation between latent mental structures and Response Selection for Prosocial Behavior after controlling for sex and school. When the mediator variables were added, the strength of the relation between Normative Beliefs and Response Selection for Prosocial Behavior and Angry Emotions and Response Selection for Prosocial Behavior was still significant but reduced ($\beta = -.20, p < .05$ for Normative Beliefs; $\beta = .11, p < .05$ for Angry Emotions). Sobel tests revealed that Response Evaluation and Outcome Evaluation for Prosocial Behavior were found to partially mediate the relation between Normative Beliefs and Response Selection for Prosocial Behavior ($Z = -5.20, p < .01$ for Response Evaluation; $Z = -2.18, p < .05$ for Outcome Evaluation). Response Evaluation and Outcome Evaluation for Prosocial Behavior were found also to partially mediate the relation between Angry Emotions and Response Selection for Prosocial Behavior ($Z = -5.20 p < .01$ for Response Evaluation; $Z = -2.54, p < .01$ for Outcome Evaluation).

In summary, there was general support for the mediational model posited in Hypothesis Four. Response Evaluation and Outcome Evaluation variables did mediate the relation between latent mental structures and Response Selection for Aggressive Behavior and Prosocial Behavior. Children with high levels of aggressive-supporting normative beliefs and angry emotions reported more favorable evaluations (e.g., Response Evaluation and Outcome Evaluation) for aggressive response options and were more likely to select aggressive responses for enactment. Conversely, children with lower levels of aggressive-supporting normative beliefs and angry emotions reported
more favorable evaluations for prosocial response options and were more likely to select prosocial responses for enactment.
DISCUSSION

The present study examined the relation among RED processes, latent mental structures, and aggressive and prosocial response selection. Previous research has found significant relations between RED processes and aggressive behavior (Boldizar et al., 1989; Crick & Ladd, 1990; Cuddy & Frame, 1991; Perry et al., 1986) and between aggressive-supporting latent mental structures and aggressive behavior (Berkowitz, 1993; Eisenberg, Fabes, & Nyman et al., 1994; Lochman & Dodge, 1994; Slaby & Guerra, 1988). However, there has been little research regarding the mechanism by which these constructs jointly contribute to the prediction of an individual’s decision to engage in aggressive behavior (i.e., aggressive response selection) and even less research on how these constructs might predict prosocial response selection.

The present study used social-information processing theory and the RED heuristic to examine the major study hypothesis: the role of RED processes (i.e., response efficacy and valuation; outcome expectancy and valuation) as mediator variables in the relation between latent mental structures and aggressive and prosocial response selection. Specifically, it was hypothesized that children enter a social conflict situation with aggressive-supporting or non-aggressive supporting latent mental structures, and then evaluate the efficacy, value, and expectancies of potential behavioral responses based on these latent mental structures. In turn, favorable evaluation of aggressive responses were hypothesized to lead to the selection of aggressive behavior response options whereas favorable evaluation of prosocial responses were hypothesized to lead to selection of prosocial behaviors for enactment.

Hypothesis One

The first hypothesis examined sex differences in major study variables. It was expected that boys would report higher levels of favorable Response Evaluation and Outcome Evaluation for
aggressive response options than girls. Conversely, it was expected that favorable Response Evaluation and Outcome Evaluation for prosocial behaviors would be higher for girls than for boys. As predicted, boys had higher levels of Response Evaluation for aggressive behaviors than girls. These findings are consistent with the literature that suggests that boys feel more capable of successfully enacting aggressive behaviors (i.e., have more efficacy) and value aggressive responses to provocation more than girls (Andreou, Vlachou & Didaskalou, 2005; Fontaine et al., 2002; Perry et al., 1986).

In contrast, girls reported higher levels of Response Evaluation for prosocial behaviors than boys. These results replicate previous findings that girls value and have more efficacy for prosocial behaviors compared to boys (Caprara, 2007; Caprara, Alessandri, DiGiunta, Panerai, & Eisenberg, 2010). Girls also reported higher expectations that valued outcomes would result from prosocial behavior compared to boys. However, there was no significant difference between boys and girls regarding their evaluations of potential outcomes resulting from aggressive behaviors. This is in contrast to previous studies which found girls to have less positive outcome evaluations for aggressive behavior compared to boys (e.g., girls expected more peer disapproval and lower levels of self-reward for engaging in aggressive behaviors compared to boys; Perry, et al., 1986; Slaby & Guerra, 1988). It is interesting that while both boys and girls expected that valued outcomes would result from aggressive behavior, girls were more likely than boys to ultimately select prosocial responses. These findings are consistent with the literature which generally finds that girls display higher levels of prosocial behavior whereas boys display higher levels of aggressive behavior (Fabes et al., 1999, Maccoby, 1998). This might be due to girls' internalization of cultural prohibitions against aggressive behavior (Perry at al., 1986) especially in terms of utilizing aggressive behavior as a method for attaining desired outcomes.
It was also hypothesized that boys would report higher levels of aggressive-supporting latent mental structures compared to girls. There were significant sex differences in reported levels of normative beliefs, persecution beliefs, and control of angry emotions. Replicating previous findings (Hubbard, 2001; Huesmann & Guerra, 1997; Huesmann, Guerra, Zelli, & Miller, 1992; Musher-Eizenman et al., 2004), boys found aggressive behavior to be more acceptable than girls, perceived more hostility in social interactions, and were less able to regulate angry emotions than girls. Although the underlying mechanisms for sex differences in latent mental structures are unknown, some researchers hypothesize that gender-role socialization and social learning during early childhood are important functions. For example, Dunn (2001) suggested that adults differ in their perceptions of young boys’ and girls’ conflict involvement and provide more negative feedback to girls in response to aggressive behaviors compared to boys. These adult responses influence children’s general beliefs about the acceptability of aggressive behaviors. Block (1973) posited that boys are reared to be task-oriented and object-oriented, whereas girls are reared to be relationship-oriented. Thus, girls may place more emphasis than boys on controlling their outward expression of anger in order to maintain social relationships. This hypothesis was supported by Fabes and Eisenberg (1992) who found that boys were more likely to vent their anger, whereas girls were more likely to use assertive responses. Additionally, girls have been found to mask facial expressions of anger more frequently than boys (Underwood, Coie, & Herbsman, 1992), possibly due to sex differences in modeling of appropriate emotional expressions in social situations (Saarni, 1979).

In summary, examinations of sex differences in major study variables generally supported Hypothesis One. Boys had higher levels of aggressive-supporting latent mental structures, more favorable Response Evaluation of aggressive responses, and were more likely to select aggressive
responses to conflict than girls. Girls had more favorable Response Evaluation for prosocial behavior and selected prosocial behaviors for enactment more than boys. Surprisingly, girls did not evaluate the potential outcomes of aggressive behavior more negatively than boys. This suggests that sex differences in RED processes are not as explicit as hypothesized. Along with emerging evidence that the gender gap in direct aggressive behavior is decreasing (Nichols, Brooks-Gunn, & Botvin, 2006; Odgers & Moretti, 2002; Salmivalli & Kaukiainen, 2004), the results of the present study suggest that traditionally held beliefs regarding sex differences in aggressive-supporting cognitions might warrant revision due to the changing nature of factors that influence children’s behavior. These factors include changing social perceptions regarding approval of aggressive behavior (Leadbeater et al., 2006) and increased rates of parenting and family risk factors salient to the development of aggression in females (e.g., family fragmentation; Moretti & Odgers, 2002). Additionally, there have been increases in aggressive female role-models presented in the media since the 1970s. Research by Huesmann et al. (2003) has provided evidence of a link between children’s identification with aggressive same-sex TV characters and aggressive behavior in later years. It is important for future studies to consider both the similarities and differences in social information processing between boys and girls.

Hypothesis Two

The second hypothesis examined the relation between Response Evaluation, Outcome Evaluation, and aggressive and prosocial response selection after controlling for sex and school differences. It was expected that children who had efficacy for and valued aggressive responses and expected that valued outcomes would result from aggressive behavior would select aggressive responses for enactment. A similar process was believed to occur in regard to the relation between prosocial-supporting RED processes and the selection of prosocial behavior responses. As
hypothesized, children who evaluated aggressive responses more favorably (i.e., had higher levels of Response Evaluation and Outcome Evaluation for aggressive behaviors) were more likely to select aggressive responses for enactment than children whose evaluation processes were less aggressive-supporting. Conversely, children who favorably evaluated prosocial responses were more likely to select prosocial responses for enactment.

Results of Hypothesis Two lend support the RED heuristic and are consistent with previous research that finds children with aggressive-supporting response and outcome evaluation processes more likely to engage in aggressive behaviors than children with less aggressive-supporting evaluative processes (Lochman & Dodge, 1994; Slaby & Guerra, 1988). However, the majority of these previous studies examined the direct effects of discrete RED processes (e.g., response efficacy only, outcome expectancy only) and aggressive behavior. There has been few studies to date (Fontaine et al., 2008) examining aggressive-supporting RED processing patterns and aggressive behavior and no studies predicting aggressive response selection as proposed in the RED heuristic, rather than observed of self-reported behavior. Further research may benefit from utilizing the constructs of Response Evaluation (i.e., the product of response efficacy and valuation) and Outcome Evaluation (i.e., the product of outcome expectancy and valuation) when assessing online RED processes.

Given the dearth of research regarding prosocial processing, it is of particular interest that prosocial response selection was predicted by prosocial-supporting Response Evaluation and Outcome Evaluation processes. Nelson and Crick (1999) noted that little is known about the applicability of social-information processing models for predicting behaviors other than aggression (e.g., prosocial behavior). The results of the present study suggest that the RED model of aggressive decision making may be generalizable to prosocial decision making. That is, children
who choose prosocial responses to conflict situations may undertake parallel evaluative processes as do children who select aggressive responses.

Although both Response Evaluation and Outcome Evaluation were significant predictors of response selection, it appears that the evaluation of responses (i.e., response efficacy and valuation) weighed more heavily than evaluation of outcomes (i.e., outcome expectancy and valuation) in determining what behaviors children selected for enactment. That is, children appeared to place more emphasis on their efficacy for and value of the potential responses when selecting behaviors for enactment compared to their expectancy for and value of potential outcomes.

Outcome Evaluation might have less importance than Response Evaluation in the present study due to the nature of the hypothesized peer conflict vignettes. The present study elicited reactive responses to conflict, rather than proactive (i.e., unsolicited) aggressive or prosocial behaviors. Price and Dodge (1989) hypothesized that in terms of aggressive behavior, proactive behavior is a goal-directed means of obtaining a desired outcome. Thus, a primary motivation in proactive aggressive behavior is obtaining a valued and likely outcome and thus would depend heavily on Outcome Evaluation of potential responses. As the peer conflict vignettes did not assess proactive behavior, children may have then placed less emphasis on their evaluation of outcomes in determining their chosen behavior for enactment.

In contrast to proactive aggressive behavior, Griffen and Gross (2004) described reactive aggression in as an immediate response to a perceived threat. The immediate need for a reaction is believed to limit an individual’s cognitive evaluation of the social situation. Fontaine and Dodge (2006) suggested that during RED processing, individuals consider all five RED processing steps, including both Response Evaluation and Outcome Evaluation, during decision making. However, the degree to which each RED process is thoroughly considered is dependent upon the social
situation. Individuals may impulsively select responses without completely engaging in each process. Given that in the present study children were asked for a reactive response to peer provocation (i.e., an immediate threat), they might have quickly determined their preference for an aggressive or prosocial behavioral response based primarily on their response efficacy and response value, especially since because these Response Evaluations are posited to occur prior to Outcome Evaluations. Further research would benefit from examining children’s decision-making in regard to both proactive and reactive situations.

Hypothesis Three

Hypothesis three stated that children with aggressive-supporting latent mental structures (i.e., high levels of aggressive-supporting normative beliefs, persecution beliefs, and angry emotions) would be more likely to choose aggressive responses to peer provocation than children whose latent mental structures were less aggressive-supporting. The direct relation between latent mental structures and aggressive and prosocial response selection was varied and partially followed the pattern predicted in Hypothesis Three. As predicted, children who believed that aggressive behavior is generally acceptable and who reported difficulties regulating their high levels of anger were more likely to select aggressive responses than children who had less aggressive-supporting normative beliefs and better control of angry emotions. Children who did not view aggression as a legitimate behavior and who reported better anger regulation and less anger were more likely to select prosocial responses. These results replicate previous findings that suggest that latent mental structures influence the types of behaviors individuals select for enactment (Berkowitz, 1993; Eisenberg et al., 1997; Huesmann & Reynolds, 2001).

Persecution beliefs, however, did not predict the selection of either aggressive responses or prosocial responses and were only marginally significantly correlated with aggressive response
selection ($r=.11 \ p<.10$). This is in contrast to the literature which suggests that individuals with high levels of persecution beliefs perceive hostility in social interactions even when no hostility is present (i.e., hostile attribution bias; Anderson & Huesmann, 2003). Hostile attribution bias has been found to facilitate aggressive behavior (Dodge, 1980; Dodge & Coie, 1987; Slaby & Guerra, 1988), whereas benign attributions facilitate prosocial behavior (Brookmeyer, et al., 2005). The conflict vignettes used in the present study included only overtly aggressive acts from peers (e.g., teasing, pushing, tripping). It is possible that many children rather accurately perceived these overt aggressive behaviors as hostile and purposeful, regardless of their levels of persecution beliefs. As such, the relation between persecution beliefs and response selection might have been stronger had the intent of the peer been more ambiguous.

In summary, the results of the present study add to the body of literature which suggests that decisions to engage in aggressive or prosocial behavior are influenced by an individual’s general attitudes, beliefs, understanding and knowledge of social rules, personality traits and biological capabilities. That persecution beliefs were not related to response selection might suggest that individuals are more likely to access stored knowledge that is salient to specific social contexts in order to assist in decision making.

Hypothesis Four

The fourth hypothesis stated that Response Evaluation and Outcome Evaluation would mediate the relation between latent mental structures and response selection. It was hypothesized that children’s latent mental structures would be associated with children’s evaluation of potential behavior responses which would, in turn, be related to their selection of an aggressive or prosocial response for enactment. There was general support for the proposed mediation model. Children with aggressive-supporting normative beliefs and angry emotions reported more favorable
evaluations of aggressive responses and selected aggressive responses for enactment (see Figure 1). Children with prosocial-supporting latent mental structures reported more favorable evaluations for prosocial responses and were more likely to ultimately select a prosocial response (see Figure 2). The direct relation between latent mental structures and response selection was reduced, albeit to varying levels, when Response Evaluation and Outcome Evaluation were added as mediators.

These findings are noteworthy for several reasons. Although social-information processing models of aggressive behavior account for the contributions of latent mental structures, most studies have not attempted to explain how formations of latent mental structures are translated into selection of aggressive responses to specific conflict situation (Burks et al, 1999). Results of the present study suggest that RED processes might explain, in part, why individuals with aggressive-supporting latent mental structures choose to respond to peer provocation with aggressive behavior. Children who generally find aggression to be acceptable and have difficulty controlling their already high levels of anger appear to evaluate aggressive responses in a favorable manner. These favorable evaluations of aggressive behavior, in turn, influence their selected responses to conflict.

Huesman and Guerra (1997) suggested that normative beliefs about the general acceptability of aggressive behavior may assist individuals in filtering out inappropriate behaviors. Children with aggressive-supporting normative beliefs are thus less likely to reject aggressive responses to peer provocation than children who generally find aggressive behavior unacceptable. When in a conflict situation, children with aggressive-supporting normative beliefs may retrieve from memory information related to successful use of aggressive behavior in past situations. This information would then influence their RED processing in the current context (e.g., a child might retrieve a script about having successfully used physical aggression to stop a peer who was teasing him and thus have high outcome expectancy for reduction of aversive treatment from physical
aggression in a similar situation).

Low levels of regulation of angry emotions also appear to support aggressive RED processing. Although aggressive behavior is not an unavoidable result of anger (Berkowitz, 1989), anger may affect an individual’s decision-making processes when responding to social conflict. For example, Crick and Ladd (1990) found that children with high levels of anger were more confident in their ability to perform aggressive acts and also expected that aggressive behavior would help them achieve their goals compared to children who were less angry. A recent study by Harper, Lemerise, and Caverly (2010) found that induced anger did not have a direct effect on response selection but did influence RED processes (e.g., self-efficacy for hostile responses). Eisenberg and Fabes (1992) posited that emotional regulation skills are important in determining if anger will lead to aggressive behavior. Children with poor abilities to regulate their high levels of anger are prone to less competent information processing and are more likely to engage in aggressive behaviors than children with better emotional regulation capabilities (Arsenio & Lemerise 2001; Crick & Dodge, 1994) Children who are predisposed to anger and have difficulties regulating their anger may also use aggressive behavior to regulate their emotional states (Bushman, Baumeister, & Phillips, 2001) and thus expect that self reward (i.e., feeling good about one’s self) will result. These factors likely influence how children perceive and react to provocation from peers.

Fontaine (2007) proposed that latent mental structures are not retrieved from an individual’s memory during RED processing unless they are needed to create a more complete representation of a social event. For example, a child who is bumped by a peer in a hallway might access from memory general beliefs about peers (e.g., whether peers are “nice” or “mean”) in order to make interpretations about the specific event. Results of the present study suggest that latent mental structures may have a more salient role in RED processing. That is, general beliefs and attitudes
supporting the acceptability of aggressive behavior might predispose an individual to evaluate specific response to provocation situations in an aggressive manner. If a child views aggressive behavior as a generally acceptable response to provocation, he or she might favorably evaluate aggressive response to peer provocation, regardless of the ambiguity of the situation. Additionally, affective regulation also appear to have an important role in RED processing, although emotional arousal and regulation is often omitted from research involving RED and SIP models in general (Lemerise & Arsineo, 2000).

However, aggressive-supporting latent mental structures alone do not appear to fully determine whether children decide to respond to peer provocation in an aggressive manner. Results of the present study suggest that RED processes also explain, in part, why individuals with aggressive-supporting latent mental structures select aggressive responses to provocation. An individual’s favorable evaluations of the potential responses and outcomes aggressive behavior increase the likelihood that he or she will select aggressive responses to a specific conflict. The present study is among the first to lend support to the RED heuristic’s conceptualization of the multiplicative processes that determine an individual’s response and outcome evaluations (Fontaine & Dodge, 2006). That is, results suggest that individuals place emphasis on both efficacy and perceived value of potential responses as well as expected outcomes and the value of those outcomes when deciding to act in an aggressive manner. These online processes may also be important in the development of latent mental structures which reinforce patterns of aggressive behavior (Burks et al., 1999).

The results of the present study provide some support to belief that prosocial children engage in prosocial-related cognitive processes, and that these processes parallel the processes found in aggressive children. The mediation model was supported in a similar fashion both in terms
of aggressive response selection and prosocial response selection. Thus, children who have latent mental structures that support prosocial behavior tended to favorably evaluate prosocial responses to peer provocation and ultimately chose to respond to provocation with prosocial behavior. These findings are especially interesting as few studies have examined the social-cognitive processes of prosocial children (Nelson & Crick, 1999). The present study lends support to the use of the RED heuristic and the SIP model in examining prosocial cognitive processes.

Some research suggests that aggressive children do evaluate certain aspects of prosocial responses in a favorable manner (e.g., expect self-reward from behaving prosocially; Cuddy & Frame, 1991). The present study might explain, in part, why some children who report favorable outcome expectancies for prosocial behavior select prosocial responses to conflict, while other children who have similar evaluations do not select prosocial behavior for enactment. It is possible that favorable outcome expectancies for prosocial behavior alone are not sufficiently motivating for some child to select prosocial response to conflict. Prosocial latent mental structures may influence multiple aspects of an individual’s RED processing, leading to a prosocial processing style. Thus, the present study adds to the current literature by helping to explain why modest effect sizes are generally found for studies predicting response selection only from discrete RED processing variables or individual latent mental structures (Lansford et al, 2006).

Limitations

In this section, limitations of the present study in terms of the sample, the constructs measured, and the design of the study will be discussed.

Sample. The sample used in the present study was restricted in age range (i.e., participants were 11- to 15-years old) and geographic location and therefore the results might not be generalizable to other populations or individuals. In particular, studies have found significant age-
related differences in correlates of the constructs assessed in the present study. For example, age-related differences have been found in levels of retaliation beliefs (i.e., beliefs about the appropriateness of aggression in response to aggressive provocation; Boxer, Tisak, & Goldstein, 2004) and the ability to recall information about the prosociability of peers (Bukowski, 1990). Future studies would benefit by examining a broader demographic base.

**Constructs.** The present study restricted the potentially broad range of response evaluation processes by supplying children with three types of response behaviors (i.e., physically aggressive responses, verbally aggressive responses, and prosocial responses). Although these responses represent a relatively broad spectrum of behaviors a child might consider when faced with peer provocation, some children might have self-generated alternative responses. That is, some children might have identified a relationally aggressive response (e.g., gossiping about the peer) or an avoidant strategy (e.g., ignoring the peer). Additionally, Fontaine and Dodge (2006) posited that response options must pass an initial acceptability threshold before they are further evaluated or selected for enactment. It is possible that for some children, the response options supplied in the present study would not pass this initial acceptability threshold and therefore would not be further evaluated if the child was actually engaged in the social situation. Likewise, some children might evaluate alternative strategies more favorably and thus might not select physically aggressive, verbally aggressive, or prosocial behaviors for enactment. The results of the present study are therefore limited to children’s evaluation and selection of restricted range of behaviors. Future research would benefit from having children identify strategies they would use to address a hypothetical conflict and then answer questions regarding their evaluations and response selection based on their self-generated response options.

Evaluations were also restricted to three potential outcomes (i.e., reduction of aversive
treatment, self reward, and peer approval). The inclusion of additional outcomes such as adult approval, attainment of a tangible reward, or victim suffering might have been of greater relevance to children and yielded significant results. Future studies would benefit from expanding the range of outcomes measured.

Another limitation of the present study is that evaluation processes were measured only in response to peer conflict rather than benign or ambiguous social situations. Children’s decision-making and selection processes in response to overt provocation may differ from their selection of responses in situations where conflict is more covert or no conflict is present. Thus, the results of the present study are limited to an understanding of children’s reactive responses to conflict. Reactive and proactive (i.e., initiated without provocation) evaluation and decision-making processes may differ in regard to both aggressive and prosocial behavior (Boxer, Tisak, & Goldstein, 2004; Schwartz, Dodge, Coie, Hubbard, Cillessen, Lemerise, et al., 1998). Additionally, Griffen and Gross (2004) suggested that immediate responses to perceived threats, such as those presented in the vignettes used in present study, may limit that cognitive evaluation of social situations. It would be beneficial for future studies to examine the proposed model in response to children’s evaluations of situations with less overt provocations.

*Design.* The present study used written vignettes to assess evaluation and decision processes that are conceptualized as online processes (i.e., occurring in real-time and affected by the social contexts experienced by the individual). These processes are thought to be highly influenced by the nature and sequence of events that unfold in a particular social situation. Although the written vignettes used in the present study were designed to mimic peer provocations that might occur during a typical school day, some contextual social information, (e.g., sex of the provocateur, images of the environment) was omitted. It is possible that the use of alternative methodologies that
present multiple, realistic, external stimuli might yield more valid results. For example, Chen and Matthews (2003) suggested that the presentation of auditory and visual cues in videotaped vignettes make it easier for participants to imagine themselves in the scenarios, and thus have greater validity in measuring children’s evaluation processes.

Another limitation is that online processes, including the RED variables assessed in the present study, are thought to be highly influenced by the specific social situation presented. Due to limitations of the study design, data was analyzed on a global scale (i.e., averaging across situations and vignettes) to assess these processes. In doing so, important information regarding the decision-making processes that occur in response to a specific sequence of events unfolding in a particular situation might have been lost when children’s responses were aggregated across vignettes (i.e., responses are “averaged out”; Johnson et al., 2001). Two seemingly similar vignettes might have been interpreted by the same child differently based on the social and environmental stimuli (e.g., a vignette set in a school lunchroom and a vignette in a playground setting might elicit different responses, even though both might present a similar peer-provocation situation such as teasing). Despite this limitation, it is important to note that the means for RED processing variables were quite high despite having been averaged across three vignettes. Alternative designs might present children with a social conflict situation and then assess, across multiple stages, children’s use of RED processes in attempt to solve the conflict situation. This type of design would assess children’s real-time processing and might provide a more accurate representation of the social cognitive processes children undertake when evaluating conflict situations.

A final limitation is that the design of the present study is correlational and cross-sectional in nature and therefore cannot establish causal relationships. As stated earlier, it was hypothesized that individuals’ evaluations of responses to peer conflict and the potential resulting outcomes
would mediate the relation between latent mental structures and response selection. Although this model has theoretical and empirical support, it is possible that the relations among these variables are reciprocal, or that latent mental structures mediate the relation between evaluation processes and response selection. Future researchers should consider a study that is longitudinal in design to clarify the specific nature of the relation among these constructs.

Implications

The present study has several significant implications for future research. The present study replicates previous studies that find latent mental structures and RED processes to have significant direct effects on aggressive and prosocial response selection. These results suggest that general beliefs, attitudes, and social knowledge, as well as evaluations of responses and outcomes in specific social situations are important in predicting whether children will respond to peer provocation in an aggressive or prosocial manner. Researchers should continue to examine the role of both of these factors in predicting responses to social conflict so that the information-processing of aggressive and prosocial children might be better understood.

The general support for the mediational model suggests that there is the role of RED processes as a mediator variable between latent mental structures and response selection. General beliefs and attitudes about aggressive behavior, as well as capabilities to control angry emotions, possibly influence how individuals evaluate social information in a specific context. These evaluations, in turn, predict whether individuals decide to respond to peer provocation in an aggressive or prosocial manner. Although research has supported the discrete contributions of aggressive-supporting latent mental structures and RED processing to predicting aggressive behavior, the present study is among the first to propose a specific mechanism for this relation. It is important that future studies examine additional ways in which these, and other social-cognitive
variables, are related to a maladaptive processing style (Lansford et al., 2006).

The present study also expands the current literature related to prosocial information processing. These findings are especially relevant as few studies have examined the social-cognitive processes of prosocial children (Nelson & Crick, 1999) and none have done so utilizing the RED heuristic. The proposed mediation model was supported in a similar fashion in regard to prosocial-supporting and aggressive-supporting information processing. This suggests that children who process information in a prosocial manner engage in parallel processes as do children whose information processing is more aggressive-supporting. It is important that this area of research be expanded as there is dearth of research applying the SIP model to prosocial behavior.

Finally, the present study has important implications for the development of prevention and intervention programs. By understanding the social-cognitive processes of children who choose to engage in aggressive behaviors, researchers will be better able to design interventions that target the reduction of aggressive-supporting cognitions. For these types of interventions to succeed, it is essential to know what social-cognitive processes are important in determining whether children choose to respond to peer conflict in an aggressive or prosocial manner. A review by Boxer and Dubow (2002) cited several prevention and intervention programs that use Huesmann’s (1998) social-information processing framework to target aggressive cognitions. These programs include interventions that target cue attention and interpretation (e.g., Promoting Alternative Thinking Strategies; Conduct Problems Prevention Research Group, 1999a; 1999b), script search and retrieval (e.g., Anger Coping Program; Lochman & Lenhart, 1993), and script evaluation (e.g., Yes I Can; Metropolitan Area Child Study Research Group; Eron et al., 2002). Results of the present study suggest that interventions that target latent mental structures (e.g., perceptions about the general acceptability of aggressive behavior; control of angry emotions) may also have value.
Continued research will inform interventions that encourage the reduction of aggressive-supporting cognitions and development of prosocial-supporting cognitions.
REFERENCES


(AAT No. 9226289)

APPENDICES

Appendix A: Hypothetical Peer Conflict Vignettes

1. Pretend you are in the hallway at school. One kid who is the same age and size as you starts picking on you by calling you names. You have to decide what to do.

   a. Some kids might push the kid who is picking on them.
   b. Some kids might yell at the kid who is picking on them.
   c. Some kids might try to work things out calmly with the kid who is picking on them.

2. Pretend you are in line in the lunch room at school. One kid who is the same age and size as you starts pushing you and you drop your lunch on the ground. You have to decide what to do.

   a. Some kids might hit the kid who pushed them.
   b. Some kids might say mean things to the kid who pushed them.
   c. Some kids might try to work things out calmly with the kid who pushed them.

3. Pretend you are on the playground at school. One kid who is the same age and size as you keeps tripping you when you’re playing a game at recess. You have to decide what to do.

   a. Some kids might shove the kid who trips them.
   b. Some kids might call the kid who tripped them names.
   c. Some kids might try to work things out calmly with the kid who trips them.
Appendix B: Response Efficacy Scale

Participants are read each item aloud and are asked to rate how hard or easy it would be to engage in each type of behavior. Responses are coded so that 1 = Really Hard, 2 = Sort of Hard, 3 = Sort of Easy, and 4 = Really Easy.

Instructions: Circle the choice that best describes what you would think or what would do.

Response Efficacy for Physical Aggression
1. How hard would it be for you to push the kid who is picking on you?
2. How hard would it be for you to hit the kid who pushed you?
3. How hard would it be for you to shove the kid who tripped you?

Response Efficacy for Verbal Aggression
1. How hard would it be for you to yell at the kid who is picking on you?
2. How hard would it be for you to say mean things kid who pushed you?
3. How hard would it be for you to call the kid who tripped you names?

Response Efficacy for Prosocial Behavior
1. How hard would it be for you to try and work things out calmly with the kid who is picking on you?
2. How hard would it be for you to try and work things out calmly with the kid who pushed you?
3. How hard would it be for you to try and work things out calmly with the kid who trips you?
Appendix C: Response Valuation Scale

Participants are read each item aloud and are asked to rate how much they like each response option. Responses are coded so that 1 = Not at All, 2 = A Little, 3 = Quite a Bit, and 4 = A Lot.

Instructions: Circle the choice that best describes what you would think or what would do.

Response Valuation for Physical Aggression
1. Some kids would like to push the kid who picks on them, other kids would not. How much would you like to push the kid who is picking on you?
2. Some kids would like to hit the kid who pushed them, other kids would not. How much would you like to hit the kid who pushed you?
3. Some kids would like to shove the kid who trips them, other kids would not. How much would you like to shove the kid who trips you?

Response Valuation for Verbal Aggression
1. Some kids would like to yell at the kid who picks on them, other kids would not. How much would you like to yell at the kid who is picking on you?
2. Some kids would like to say mean things to the kid who pushed them, other kids would not. How much would you like to say mean things to the kid who pushed you?
3. Some kids would like to call the kid who tripped them names, other kids would not. How much would you like to call the kid who tripped you names?

Response Valuation for Prosocial Behavior
1. Some kids would like to try and work things out calmly with the kid who picks on them, other kids would not. How much would you like to try and work things out calmly with the kid who is picking on you?
2. Some kids would like to tell the kid to try and work things out calmly with the kid who pushed them, other kids would not. How much would you like to try and work things out calmly with the kid who is pushing you?
3. Some kids would like to try and work things out calmly with the kid who trips them, other kids would not. How much would you like to try and work things out calmly with the kid who trips you?
Appendix D: Outcome Expectancy Scale

Participants are read each item aloud and are asked to rate how much they think each statement is true. Responses are coded so that 1 = Not at All, 2 = A Little, 3 = Quite a Bit, and 4 = A Lot.

Instructions: Circle the choice that best describes what you would think or what would do.

Outcome Expectancy for Physical Aggression

1. Reduction of Aversive Treatment
   a. If you push the kid, the kid might stop picking on you. How sure are you that the kid would stop picking on you if you push the kid?
   b. If you hit the kid, the kid might stop pushing you. How sure are you that the kid would stop pushing you if you hit the kid?
   c. If you shove the kid, the kid might stop tripping you. How sure are you that the kid would stop tripping you if you shove the kid?

2. Self Reward
   a. If you push the kid, you might feel good about yourself. How sure are you that you would feel good about yourself if you push the kid?
   b. If you hit the kid, you might feel good about yourself. How sure are you that you would feel good about yourself if you hit the kid?
   c. If you shove the kid, you might feel good about yourself. How sure are you that you would feel good about yourself if you shove the kid?

3. Peer Approval
   a. How much would your classmates like it if you push the kid?
   b. How much would your classmates like it if you hit the kid?
   c. How much would your classmates like it if you shove the kid?

Outcome Expectancy for Verbal Aggression

1. Reduction of Aversive Treatment
   a. If you yell at the kid, the kid might stop picking on you. How sure are you that the kid would stop picking on you if you yell at the kid?
   b. If you say mean things to the kid, the kid might stop pushing you. How sure are you that the kid would stop pushing you if you say mean things to the kid?
   c. If you call the kid names, the kid might stop tripping you. How sure are you that the kid would stop tripping you if you call the kid names?

2. Self Reward
   a. If you yell at the kid, you might feel good about yourself. How sure are you that you would feel good about yourself if yell at the kid?
   b. If you say mean things to the kid, you might feel good about yourself. How sure are you that you would feel good about yourself if you say mean things to the kid?
c. If you call the kid names, you might feel good about yourself. How sure are you that you would feel good about yourself if you called the kid names?

3. Peer Approval
   a. How much would your classmates like it if you yell at the kid?
   b. How much would your classmates like it if you say mean things to the kid?
   c. How much would your classmates like if you called the kid names?

Outcome Expectancy for Prosocial Behavior

1. Reduction of Aversive Treatment
   a. If you try and work things out calmly, the kid might stop picking on you. How sure are you that the kid would stop picking on you if you say “Let’s not fight”?
   b. If you try and work things out calmly, the kid might stop pushing you. How sure are you that the kid would stop pushing you tell the kid to stop?
   c. If you try and work things out calmly, the kid might stop tripping you. How sure are you that the kid would stop tripping you if you tell the kid to stop?

2. Self Reward
   a. If you try and work things out calmly, you might feel good about yourself. How sure are you that you would feel good about yourself if you try and work things out with the kid?
   b. If you try and work things out calmly, you might feel good about yourself. How sure are you that you would feel good about yourself if you try and work things out with the kid?
   c. If you try and work things out calmly, you might feel good about yourself. How sure are you that you would feel good about yourself if you try and work things out with the kid?

3. Peer Approval
   a. How much would your classmates like it if you try and work things out calmly with the kid?
   b. How much would your classmates like it if you try and work things out calmly with the kid?
   c. How much would your classmates like it if you try and work things out calmly with the kid?
Appendix E: Outcome Valuation Scale

Participants are read each item aloud and are asked to rate how important they perceive each outcome. Responses are coded so that 1 = Not at All, 2 = A Little, 3 = Quite a Bit, and 4 = A Lot.

Instructions: Circle the choice that best describes what you would think or what would do.

Outcome Valuation for Reduction of Aversive Treatment
1. How important is it to you that the kid stops [picking on/pushing/tripping] you in this situation?

Outcome Valuation for Self Reward
1. How important is it to you that you feel good about yourself in this situation?

Outcome Valuation for Self Reward
1. How important is it to you that your classmates like what you do in this situation?
Appendix F: Response Selection Scale

Participants are read each item aloud and are asked to rate their level of confidence that they would engage in each behavior. Responses are coded so that 1 = Very sure I wouldn’t, 2 = Pretty sure I wouldn’t, 3 = Pretty sure I would, and 4 = Very sure I would.

Instructions: Circle the choice that best describes what you would think or what would do.

Physical Aggression Response
1. Would you push the kid?
2. Would you hit the kid?
3. Would you shove the kid?

Verbal Aggression Response
1. Would you yell at the kid?
2. Would you say mean things to the kid?
3. Would you call the kid names?

Prosocial Response
1. Would you try and work things out calmly with the kid?
2. Would you try and work things out calmly with the kid?
3. Would you try and work things out calmly with the kid?
Appendix G: Normative Beliefs About Aggressive Behavior (NOBAGS) General Belief subscale

Participants are read each item aloud and are asked to rate how much they think each statement is true. Responses are coded so that 1 = Never, 2 = Sometimes, 3 = Usually, and 4 = Always.

Instructions: Circle the choice that tells how much you think each sentence is true.

1. In general, it is wrong to hit other people.
2. If you're angry, it is OK to say mean things to other people.
3. In general, it is OK to yell at others and say bad things.
4. It is usually OK to push or shove other people around if you're mad.
5. It is wrong to insult other people
6. It is wrong to take it out on others by saying mean things when you're mad.
7. It is generally wrong to get into physical fights with others.
8. In general, it is OK to take your anger out on others by using physical force.
Appendix H: State-Trait Anger Expression Inventory for Children and Adolescents (STAXI-CA)

Trait Anger Scale

Participants are read each item aloud and are asked to rate how much they think each statement describes themselves. Responses are coded so that 1 = Hardly Ever, 2 = Sometimes, and 3 = Often.

Instructions: Below is a list of how some boys and girls describe themselves. Listen to each statement and tell us how you usually feel.

Angry Temperament Subscale

1. I have a bad temper
2. I lose my temper easily (reworded from “I fly off the handle”).
3. I get angry very quickly.
4. When I get mad, I say nasty things.

Angry Reactions Subscale

5. I get annoyed when I am not praised for doing a good job (reworded from “I get annoyed when I am not given recognition for a job well done”).
6. I feel really mad when I do a good job and get criticized (reworded from “I feel infuriated when I do a good job and get a poor evaluation”).
7. I get angry when I have to wait because of others’ mistakes.
8. I get angry when I’m told I’m wrong in front of others.
Appendix I: Emotional Regulation Scale

Participants are read each item aloud and are asked to rate how much they think each statement is true of themselves. Responses are coded so that 1 = Not at all True, 2 = Somewhat True, and 3 = Very True.

Instructions: Below is a list of statements that describe the way some people are. Please tell us how true are these statements are of you.

1. When you feel upset, it is easy for you to calm down.
2. It takes a lot to get you angry, nervous, or upset.
3. When you get upset or excited, you get VERY upset or excited.
4. Your bad moods are very strong
Appendix J: Persecution Beliefs Scale

Participants are read each item aloud and are asked to rate how much they think each statement is true of themselves. Responses are coded so that 1 = Never, 2 = Hardly Ever, 3 = Sometimes, and 4 = A Lot.

Instructions: Sometimes people feel that other people are not nice to them. We would like you to tell us how you think other people behave towards you.

1. People want to be mean to me.
2. People get angry at me more than they do at others.
3. Everyone is out to get me.
4. People take their anger out on me more than they do on others.
5. People are mean to me more than they are to others.
6. People want to make things difficult for me.
7. People like bothering me just for the sake of doing it.
Table 1

*Means and Standard Deviations for Latent Mental Structure Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normative Beliefs</td>
<td>213</td>
<td>1.92</td>
<td>.66</td>
</tr>
<tr>
<td>Persecution Beliefs</td>
<td>212</td>
<td>2.06</td>
<td>.82</td>
</tr>
<tr>
<td>Emotional Regulation</td>
<td>211</td>
<td>1.82</td>
<td>.45</td>
</tr>
<tr>
<td>Trait Anger</td>
<td>209</td>
<td>1.86</td>
<td>.51</td>
</tr>
</tbody>
</table>

*Means reflect the following response scale: 1 = Never, 2 = Sometimes, 3 = Usually, and 4 = Always. *Means reflect the following response scale: 1 = Never, 2 = Hardly Ever, 3 = Sometimes, and 4 = A Lot. *Means reflect the following response scale: 1 = Not at all True of You, 2 = Somewhat True of You, 3 = Very True of You. *Means reflect the following response scale: 1 = Hardly Ever, 2 = Sometimes, 3 = Often.
Table 2

*Intercorrelations Among Latent Mental Structure Variables*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Normative Beliefs</td>
<td>---</td>
<td>.08</td>
<td>-.23**</td>
<td>.33**</td>
</tr>
<tr>
<td>2. Persecution Beliefs</td>
<td>---</td>
<td></td>
<td>-.35**</td>
<td>.42**</td>
</tr>
<tr>
<td>3. Emotional Regulation</td>
<td></td>
<td>---</td>
<td></td>
<td>-.53**</td>
</tr>
<tr>
<td>4. Trait Anger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p < .01.
Table 3

*Means and Standard Deviations for Response Evaluation Variables and Response Selection Variables*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response Efficacy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>2.84</td>
<td>.93</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>3.08</td>
<td>.80</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>2.34</td>
<td>.88</td>
</tr>
<tr>
<td><strong>Response Valuation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>1.93</td>
<td>.88</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>2.88</td>
<td>.85</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>2.41</td>
<td>.92</td>
</tr>
<tr>
<td><strong>Outcome Expectancy for Reduction of Aversive Treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>2.15</td>
<td>.86</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>1.98</td>
<td>.77</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>2.15</td>
<td>.80</td>
</tr>
<tr>
<td><strong>Outcome Expectancy for Self Reward</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>214</td>
<td>2.20</td>
<td>.88</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>214</td>
<td>2.16</td>
<td>.84</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>2.57</td>
<td>.92</td>
</tr>
<tr>
<td><strong>Outcome Expectancy for Peer Approval</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>214</td>
<td>2.29</td>
<td>.91</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>214</td>
<td>2.14</td>
<td>.84</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>214</td>
<td>2.48</td>
<td>.92</td>
</tr>
<tr>
<td><strong>Outcome Valuation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction of Aversive Treatment</td>
<td>215</td>
<td>3.26</td>
<td>.72</td>
</tr>
<tr>
<td>Self Reward</td>
<td>215</td>
<td>2.99</td>
<td>.88</td>
</tr>
<tr>
<td>Peer Approval</td>
<td>214</td>
<td>2.47</td>
<td>.98</td>
</tr>
<tr>
<td><strong>Response Selection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>2.57</td>
<td>.94</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>2.71</td>
<td>.88</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>2.49</td>
<td>.96</td>
</tr>
</tbody>
</table>

*aMeans reflect the following response scale: 1 = Really Hard, 2 = Sort of Hard, 3 = Sort of Easy, and 4 = Really Easy.*

*bMeans reflect the following response scale: 1 = Not at All, 2 = A Little, 3 = Quite a Bit, and 4 = A Lot.*

*cMeans reflect the following response scale: 1 = Very Sure I Wouldn’t, 2 = Pretty Sure I Wouldn’t, 3 = Pretty Sure I Would, 4 = Very Sure I Would.*
Table 4

*Intercorrelations Among Response Efficacy and Response Valuation for Aggressive and Prosocial Behavior Variables*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Response Efficacy PA</td>
<td>---</td>
<td>.65**</td>
<td>-.32**</td>
<td>.69**</td>
<td>.54**</td>
<td>-.48**</td>
</tr>
<tr>
<td>2. Response Efficacy VA</td>
<td>---</td>
<td>-.33**</td>
<td>.65**</td>
<td>.69**</td>
<td>-.43**</td>
<td></td>
</tr>
<tr>
<td>3. Response Efficacy PRO</td>
<td>---</td>
<td>-.42**</td>
<td>-.38**</td>
<td>.72**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Response Valuation PA</td>
<td>---</td>
<td>.77**</td>
<td>-.49**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Response Valuation VA</td>
<td>---</td>
<td>-.41**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Response Valuation PRO</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* PA = Physical Aggressive Behavior. VA = Verbal Aggressive Behavior. PRO = Prosocial Behavior.

*p < .05. **p < .01.*
### Table 5

**Intercorrelations Among Outcome Expectancy and Outcome Valuation for Aggressive and Prosocial Behavior Variables**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OE Aversive Treatment PA</td>
<td>---</td>
<td>.61**</td>
<td>-.02</td>
<td>.57**</td>
<td>.51**</td>
<td>-.18**</td>
<td>.42**</td>
<td>.40**</td>
<td>-.14*</td>
<td>-.11</td>
<td>.04</td>
<td>.02</td>
</tr>
<tr>
<td>2. OE Aversive Treatment VA</td>
<td>---</td>
<td>.13</td>
<td>.55**</td>
<td>.64**</td>
<td>-.12</td>
<td>.32**</td>
<td>.42**</td>
<td>-.08</td>
<td>-.07</td>
<td>.10</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>3. OE Aversive Treatment PRO</td>
<td>---</td>
<td>-.11</td>
<td>-.08</td>
<td>.59**</td>
<td>-.10</td>
<td>.02</td>
<td>.48**</td>
<td>.11</td>
<td>.25**</td>
<td>.19**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. OE Self Reward PA</td>
<td>---</td>
<td>.81**</td>
<td>-.34**</td>
<td>.50**</td>
<td>.46**</td>
<td>-.21**</td>
<td>-.11</td>
<td>.02</td>
<td>.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. OE Self Reward VA</td>
<td>---</td>
<td>-.32**</td>
<td>.45**</td>
<td>.53**</td>
<td>-.19**</td>
<td>-.08</td>
<td>.03</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. OE Self Reward PRO</td>
<td>---</td>
<td>-.21**</td>
<td>-.09</td>
<td>.46**</td>
<td>.26**</td>
<td>.43**</td>
<td>.23**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. OE Peer Approval PA</td>
<td>---</td>
<td>.80**</td>
<td>-.46**</td>
<td>-.06</td>
<td>.01</td>
<td>-.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. OE Peer Approval VA</td>
<td>---</td>
<td>-.34**</td>
<td>-.04</td>
<td>.06</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. OE Peer Approval PRO</td>
<td>---</td>
<td>.21**</td>
<td>.25**</td>
<td>.39**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. OV Aversive Treatment</td>
<td>---</td>
<td>.44**</td>
<td>.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. OV Self Reward</td>
<td>---</td>
<td>.35**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. OV Peer Approval</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* OE = Outcome Expectancy, OV = Outcome Valuation, PA = Physical Aggressive Behavior, VA = Verbal Aggressive Behavior, PRO = Prosocial Behavior. 

* *p < .05. ** *p < .01.
Table 6

Means and Standard Deviations Response Evaluation and Outcome Evaluation Variables

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>9.00</td>
<td>4.66</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>9.51</td>
<td>4.36</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>6.33</td>
<td>4.09</td>
</tr>
<tr>
<td><strong>Outcome Evaluation Reduction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aversive Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>6.94</td>
<td>3.15</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>215</td>
<td>6.43</td>
<td>2.90</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>7.09</td>
<td>3.35</td>
</tr>
<tr>
<td><strong>Outcome Evaluation Self Reward</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>215</td>
<td>6.63</td>
<td>3.53</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>214</td>
<td>6.50</td>
<td>3.34</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>215</td>
<td>8.07</td>
<td>4.29</td>
</tr>
<tr>
<td><strong>Outcome Evaluation Peer Approval</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Aggressive Behavior</td>
<td>213</td>
<td>5.64</td>
<td>3.20</td>
</tr>
<tr>
<td>Verbal Aggressive Behavior</td>
<td>213</td>
<td>5.29</td>
<td>3.12</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>213</td>
<td>6.51</td>
<td>4.17</td>
</tr>
</tbody>
</table>

*Note. Scores for Response Evaluation and Outcome Evaluation ranged from 1 to 16 with higher scores indicating more positive evaluation.*
Table 7

*Intercorrelations Among Outcome Evaluation for Aggressive and Prosocial Behavior Variables*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Aversive Treatment PA</td>
<td>---</td>
<td>.68**</td>
<td>.20**</td>
<td>.51**</td>
<td>.48**</td>
<td>.08</td>
<td>.32**</td>
<td>.33**</td>
<td>.02</td>
</tr>
<tr>
<td>2. Aversive Treatment VA</td>
<td>---</td>
<td>.38**</td>
<td>.48**</td>
<td>.58**</td>
<td>.17*</td>
<td>.26**</td>
<td>.33**</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>3. Aversive Treatment PRO</td>
<td>---</td>
<td>.09</td>
<td>.12</td>
<td>.64**</td>
<td>.08</td>
<td>.14**</td>
<td>.44**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self Reward PA</td>
<td>---</td>
<td>.87**</td>
<td>.18*</td>
<td>.47**</td>
<td>.42**</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Self Reward VA</td>
<td>---</td>
<td>.18*</td>
<td>.44**</td>
<td>.46**</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Self Reward PRO</td>
<td>---</td>
<td>.08</td>
<td>.15*</td>
<td>.47**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Peer Approval PA</td>
<td>---</td>
<td>.88**</td>
<td>.24**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Peer Approval VA</td>
<td>---</td>
<td>.32**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Peer Approval PRO</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. PA = Physical Aggressive Behavior. VA = Verbal Aggressive Behavior. PRO = Prosocial Behavior.  
*p < .05. **p < .01.*
Table 8

**Between-Subjects Sex and Grade Differences in Major Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sex</th>
<th></th>
<th>Sex</th>
<th></th>
<th>Six</th>
<th>SD</th>
<th>Seven</th>
<th>SD</th>
<th>Eight</th>
<th>SD</th>
<th>multivariate F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>8.05 *</td>
<td>4.17</td>
<td>10.33 **</td>
<td>3.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>7.47 *</td>
<td>4.19</td>
<td>5.37 **</td>
<td>3.74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>5.85 *</td>
<td>2.42</td>
<td>6.59 **</td>
<td>2.45</td>
<td>3.43</td>
<td></td>
<td>5.86</td>
<td>2.40</td>
<td>5.96 *</td>
<td>2.43</td>
<td>6.99 *</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>8.01 *</td>
<td>3.45</td>
<td>6.61 **</td>
<td>2.95</td>
<td>10.80**</td>
<td></td>
<td>7.42</td>
<td>3.55</td>
<td>7.12</td>
<td>3.40</td>
<td>7.34</td>
</tr>
<tr>
<td>Response Selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>2.35 *</td>
<td>.79</td>
<td>2.90 **</td>
<td>.80</td>
<td>2.42</td>
<td>.81</td>
<td>2.68</td>
<td>.82</td>
<td>2.80</td>
<td>.85</td>
<td>1.53</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>2.77 *</td>
<td>.92</td>
<td>2.23 **</td>
<td>.92</td>
<td>2.69</td>
<td>.93</td>
<td>2.44</td>
<td>.99</td>
<td>2.36</td>
<td>.91</td>
<td>.98</td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td>1.73 *</td>
<td>.66</td>
<td>2.07 **</td>
<td>.63</td>
<td>.78</td>
<td>.66</td>
<td>1.96</td>
<td>.72</td>
<td>1.97</td>
<td>.58</td>
<td>1.05</td>
</tr>
<tr>
<td>Persecution Beliefs</td>
<td>1.95 *</td>
<td>.72</td>
<td>2.16 **</td>
<td>.91</td>
<td>2.05</td>
<td>.87</td>
<td>2.18</td>
<td>.84</td>
<td>1.91</td>
<td>.73</td>
<td>1.98</td>
</tr>
<tr>
<td>Angry Emotions</td>
<td>1.90 *</td>
<td>.43</td>
<td>2.03 **</td>
<td>.44</td>
<td>4.80*</td>
<td></td>
<td>1.89</td>
<td>.44</td>
<td>2.04</td>
<td>.41</td>
<td>1.95</td>
</tr>
</tbody>
</table>

*Note.* MANOVAs were computed to determine between-subjects differences. Subscript letters in rows indicate significant between-subjects differences.

*p < .05. **p < .01.
### Table 9

**Between-Subjects Race and School Differences in Major Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Race</th>
<th>School</th>
<th>School</th>
<th>multivariate F</th>
<th>univariate F</th>
<th>School</th>
<th>School</th>
<th>multivariate F</th>
<th>univariate F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Other</td>
<td>School A</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Response Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>9.04</td>
<td>4.15</td>
<td>10.42</td>
<td>4.44</td>
<td>2.38</td>
<td>8.70</td>
<td>4.17</td>
<td>9.24</td>
<td>4.21</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>6.29</td>
<td>4.01</td>
<td>6.85</td>
<td>4.54</td>
<td>.61</td>
<td>6.66</td>
<td>4.24</td>
<td>5.51</td>
<td>3.45</td>
</tr>
<tr>
<td>Outcome Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>6.02b</td>
<td>2.31</td>
<td>7.54a</td>
<td>2.94</td>
<td>9.00**</td>
<td>6.20</td>
<td>2.49</td>
<td>6.34</td>
<td>2.39</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>7.15</td>
<td>3.26</td>
<td>8.08</td>
<td>3.24</td>
<td>2.28</td>
<td>7.50</td>
<td>3.39</td>
<td>6.61</td>
<td>3.75</td>
</tr>
<tr>
<td>Response Selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>2.60</td>
<td>.83</td>
<td>2.83</td>
<td>.87</td>
<td>1.54</td>
<td>2.54</td>
<td>.85</td>
<td>2.93</td>
<td>.71</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>2.49</td>
<td>.95</td>
<td>2.51</td>
<td>1.01</td>
<td>.07</td>
<td>2.59</td>
<td>.95</td>
<td>2.18b</td>
<td>.90</td>
</tr>
<tr>
<td>Normative Beliefs</td>
<td>1.88</td>
<td>.64</td>
<td>2.09</td>
<td>.76</td>
<td>2.01</td>
<td>1.89</td>
<td>.67</td>
<td>1.97</td>
<td>.66</td>
</tr>
<tr>
<td>Persecution Beliefs</td>
<td>2.04</td>
<td>.82</td>
<td>2.18</td>
<td>.84</td>
<td>.56</td>
<td>2.09</td>
<td>.84</td>
<td>1.96</td>
<td>.78</td>
</tr>
<tr>
<td>Angry Emotions</td>
<td>1.94b</td>
<td>.42</td>
<td>2.15a</td>
<td>.48</td>
<td>5.76*</td>
<td>1.95</td>
<td>.42</td>
<td>2.02</td>
<td>.48</td>
</tr>
</tbody>
</table>

*Note.* MANOVAs were computed to determine between-subjects differences. Subscript letters in rows indicate significant between-subjects differences. *p < .05. **p < .01.
Table 10

*Predicting Aggressive Response Selection from the Demographic, Response Evaluation, and Outcome Evaluation for Aggressive Behavior Variables*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Demographic variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex ($\beta$)$^a$</td>
<td>.31**</td>
<td>.09**</td>
</tr>
<tr>
<td>School ($\beta$)$^b$</td>
<td>.20**</td>
<td>.02</td>
</tr>
<tr>
<td>Step 2: Predictor Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Evaluation for AGG ($\beta$)</td>
<td></td>
<td>.78**</td>
</tr>
<tr>
<td>Outcome Evaluation for AGG ($\beta$)</td>
<td>.09*</td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>.14</td>
<td>.60</td>
</tr>
<tr>
<td>$F$-value for step</td>
<td>$F_{(2,205)} = 16.84^{**}$</td>
<td>$F_{(2,203)} = 247.76^{**}$</td>
</tr>
</tbody>
</table>

*Note. AGG = Aggressive Behavior. $^a$Sex was coded as follows: 1 = female, 2 = male. $^b$School was coded as follows: 1 = School A, 2 = School B
$p < .05. **p < .01.*
Table 11

Predicting Prosocial Response Selection from the Demographic, Response Evaluation, and Outcome Evaluation for Prosocial Behavior Variables

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Demographic variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (β)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.26**</td>
<td>-.08</td>
</tr>
<tr>
<td>School (β)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.18**</td>
<td>-.08</td>
</tr>
<tr>
<td>Step 2: Predictor Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Evaluation for PRO (β)</td>
<td>.62**</td>
<td></td>
</tr>
<tr>
<td>Outcome Evaluation for PRO (β)</td>
<td>.16**</td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>.10</td>
<td>.50</td>
</tr>
<tr>
<td>F-value for step</td>
<td>$F_{(2,205)} = 11.66^{**}$</td>
<td>$F_{(2,203)} = 79.50^{**}$</td>
</tr>
</tbody>
</table>

Note. PRO = Prosocial Behavior. <sup>a</sup>Sex was coded as follows: 1 = female, 2 = male. <sup>b</sup>School was coded as follows: 1 = School A, 2 = School B

*p < .05. **p < .01.
### Table 12

**Predicting Aggressive and Prosocial Response Selection from the Demographic and Latent Mental Structure Variables**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Aggressive Response Selection</th>
<th>Prosocial Response Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
<td>Step 2</td>
</tr>
<tr>
<td><strong>Step 1: Demographic variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (β)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.31**</td>
<td>.16**</td>
</tr>
<tr>
<td>School (β)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.20**</td>
<td>.15**</td>
</tr>
<tr>
<td><strong>Step 2: Predictor Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Beliefs (β)</td>
<td>.44**</td>
<td></td>
</tr>
<tr>
<td>Persecution Beliefs (β)</td>
<td>-.04</td>
<td></td>
</tr>
<tr>
<td>Angry Emotions (β)</td>
<td>.28**</td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>.14</td>
<td>.32</td>
</tr>
<tr>
<td>F-value for step</td>
<td>F(2,205) = 16.84**</td>
<td>F(3,202) = 41.64**</td>
</tr>
</tbody>
</table>

*Note.* <sup>a</sup>Sex was coded as follows: 1 = female, 2 = male. <sup>b</sup>School was coded as follows: 1 = School A, 2 = School B.

*<sup>p</sup> < .05. **<sup>p</sup> < .01.
### Table 13

**Demographic Variables, Latent Mental Structure Predictor Variables, and the Response Evaluation and Outcome Evaluation for Aggressive Behavior Mediator Variables Predict Aggressive Response Selection**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Demographic variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (β)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.31**</td>
<td>.16**</td>
<td>.07*</td>
</tr>
<tr>
<td>School (β)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.20**</td>
<td>.15**</td>
<td>.04</td>
</tr>
<tr>
<td><strong>Step 2: Predictor Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Beliefs (β)</td>
<td>.44**</td>
<td>.18**</td>
<td></td>
</tr>
<tr>
<td>Persecution Beliefs (β)</td>
<td>-.04</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Angry Emotions (β)</td>
<td>.28**</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3: Mediator Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Evaluation for AGG (β)</td>
<td></td>
<td></td>
<td>.67**</td>
</tr>
<tr>
<td>Outcome Evaluation for AGG (β)</td>
<td></td>
<td></td>
<td>.09*</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.14</td>
<td>.32</td>
<td>.30</td>
</tr>
<tr>
<td>F-value for step</td>
<td>F&lt;sub&gt;(2,205)&lt;/sub&gt; = 16.84**</td>
<td>F&lt;sub&gt;(3,202)&lt;/sub&gt; = 41.64**</td>
<td>F&lt;sub&gt;(2,200)&lt;/sub&gt; = 136.99**</td>
</tr>
</tbody>
</table>

**Note.** AGG = Aggressive Behavior. <sup>a</sup>Sex was coded as follows: 1 = female, 2 = male. <sup>b</sup>School was coded as follows: 1 = School A, 2 = School B

*p < .05. **p < .01.
Table 14

*Demographic Variables, Latent Mental Structure Predictor Variables, and the Response Evaluation and Outcome Evaluation for Prosocial Behavior Mediator Variables Predict Prosocial Response Selection*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Demographic variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (β)*</td>
<td>-.26**</td>
<td>-.14*</td>
<td>-.05</td>
</tr>
<tr>
<td>School (β)b</td>
<td>-.18**</td>
<td>-.13*</td>
<td>-.07</td>
</tr>
<tr>
<td>Step 2: Predictor Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normative Beliefs (β)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persecution Beliefs (β)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angry Emotions (β)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3: Mediator Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response Evaluation for PRO (β)</td>
<td>.55**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome Evaluation for PRO(β)</td>
<td>.12*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>.10</td>
<td>.26</td>
<td>.30</td>
</tr>
<tr>
<td>F-value for step</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(2,205) =</td>
<td>11.66**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(3,202) =</td>
<td>27.46**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F(2,200) =</td>
<td>90.33**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. PRO = Prosocial Behavior. *Sex was coded as follows: 1 = female, 2 = male. *School was coded as follows: 1 = School A, 2 = School B. *p < .05. **p < .01.
Figure 1

- Normative Beliefs
- Persecution Beliefs
- Angry Emotions
- Response Evaluation for Aggressive Behavior
- Outcome Evaluation for Aggressive Behavior
- Response Selection for Aggressive Behavior

**Note.** The parenthesized values are the standardized betas when the mediators are not included in the model. 
* *p < .05. ** *p < .01.
Figure 2

Note. The parenthesized values are the standardized betas when the mediators are not included in the model.
*p < .05. **p < .01.