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## **Does Inhibitory Control and Emotion Regulation Alter the Degree to Which Aggressogenic Thought is Expressed?**

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DOES INHIBITORY CONTROL AND EMOTION REGULATION ALTER THE  
DEGREE TO WHICH AGGREGATIVE THOUGHT IS EXPRESSED?

A dissertation submitted in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PSYCHOLOGY

to the faculty of the

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of

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at

ST. JOHN'S UNIVERSITY

New York

by

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Date Submitted: \_\_\_\_\_

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## ABSTRACT

### DOES INHIBITORY CONTROL AND EMOTION REGULATION ALTER THE DEGREE TO WHICH AGGRESSOGENIC THOUGHT IS EXPRESSED?

Jessica Held

The effects of emotion dysregulation and inhibitory control on aggressogenic thought-behavior associations were investigated among 362 fifth- and sixth-grade boys (n = 195) and girls (n = 167) on Long Island, New York. Other-reported anger dysregulation and inhibitory control significantly qualified the relationship between all three cognitions (hostile attributions of intent, revenge goals in both ambiguous and unambiguous situations, and self-efficacy) and aggression. However, our predicted pattern for these 3-way interaction was supported only when the cognition involved self-efficacy—self-efficacy for aggression was most strongly associated with aggressive behavior under high levels of anger dysregulation and low levels of inhibitory control. In contrast, for the other three indexes of cognition, the strongest associations with aggression were obtained when children were low in anger dysregulation and high in inhibitory control (although aggression was also the lowest at these combinations). Associations between all cognitions (except for hostile attributions) and aggression were also qualified by (other-reported) depressed-affect dysregulation and inhibitory control. As expected, cognition-behavior associations were unrelated to aggression when children evidenced high levels of depressed-affect dysregulation and high levels of inhibitory control—this pattern was also associated with the lowest overall levels of aggression. These findings partially

support prior theory and research asserting that behavior is the result of a complex interplay between emotion dysregulation, inhibitory control, and social cognitions. The present research highlights the importance of examining the interactions among these variables to inform interventions aimed to reduce aggressive behavior in schools.

Keywords: Anger; Depressed affect; Inhibitory control; Aggressive cognitions; Aggression.

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## **Chapter I**

### **INTRODUCTION**

Aggression in schools is a serious concern for any adult who is tasked with ensuring the wellbeing of students. Aggressive behavior is harmful for both aggressors' and victims' long-term adjustment (Copeland, Wolke, Angold, & Costello, 2013). Since there is growing evidence that daily school-yard aggression can develop into more serious aggression and violence as children get older (Leff, Power, Manz, Costigan, & Nabors, 2001), many researchers and educators have affirmed the need to better understand the factors that lead to aggression, in order to reduce these behaviors in schools. Furthermore, aggression among children has been associated with a host of negative outcomes, including increased internalizing problems and poor peer relations (Card et al. 2008), and exhibiting aggression in childhood has been shown to be related to the use of aggression later in life (Schaeffer et al. 2003). Previous research has illuminated processes that motivate children to express or inhibit aggressive behavior, such as approach-related emotions such as anger, inhibition-related emotions such as depressed affect, aggressogenic cognitions, and children's ability to control their behavior.

Our primary goal was to identify the impact of different moderators on the connection between cognitions and aggressive behavior. The way that children think does not always result in aggressive behavior, which suggests that there are other factors that can influence the probability that children act on their aggression-supporting thought. We sought to extend prior work guided by social information processing theories (e.g., Crick & Dodge, 1994) by simultaneously evaluating different moderators posited by Read et al.

(2010) and others (e.g., Keltner Anderson, and Gruenfeld, 2003) that may increase or decrease the likelihood that cognition-behavior processes become operative. A brief overview of social information processing is presented, followed by a review of conditions that likely alter the degree to which social information processing mechanisms guide behavior.

## Chapter II

### LITERATURE REVIEW

#### **Social Information Processing**

Many efforts have approached aggressive behavior by attempting to understand how children think about everyday situations, as well as their interactions with peers. Crick and Dodge's (1994) reformulation of the social information-processing model of children's behavior has provided significant advances in the understanding of social adjustment. This model posited that children bring to social situations both a set of biologically limited capabilities and a database of memories with past experiences. As they receive as input an array of cues, their behavioral responses are a function of processing those cues. In steps 1 and 2 of this model, children first selectively attend to particular situations and internal cues, encode those cues, and then interpret them. During step 3, after interpreting those cues, children select a goal or desired outcome for the situation. At step 4, children access from memory possible responses to the situation. At step 5, the child evaluates the previously accessed responses and selects the most positively evaluated response to enact. Finally, at step 6, the chosen response is enacted. This model was a crucial development to better explain how thought processes may influence social behavior. They hypothesized that these processing steps occur rapidly and in parallel with numerous feedback loops, however, the system is better understood when analyzed sequentially. The present study focused on processes that occur during different steps of this model in an attempt to recognize the driving forces of aggressive behavior. The steps highlighted here are those that previous research have also referenced to better understand aggressive behavior.

## **Step 2: Hostile Attribution of Intent**

Step 2 of Crick and Dodge's reformulated model focused on the interpretation and the mental representation of social cues. After step 1 when the child is simply attending to the cue, they will then interpret this action and determine why it occurred. Crick and Dodge asserted that a child enters a social situation with past experiences and recurring cognitions that they may access during a social exchange. These cognitions can affect the interpretation of this encounter as well as the response they choose, depending on whether the child decodes the intention as an accident or purposeful. The early steps of social information processing involving this encoding and decoding of information has been shown to play a significant role in aggressive behavior through hostile attribution biases (Oostermeijer, 2016). If the child interprets the intent of an action as hostile in nature, this cognition may influence how the child acts in later steps of the process. Aggressive individuals exhibit a strong tendency to attribute hostile intent to the behavior of others, which may lead to provocation and aggravation of socially inappropriate reactions (Schonberg & Jusyte, 2014). An individual with a hostile attribution bias may quickly make the inference that an ambiguous action of a peer that results in a negative outcome (e.g., bumping a table and spilling the child's milk) is hostile in nature, even before encoding specific hostile or non-hostile cues available in the situation (e.g., the peer laughing when the milk is spilled). Numerous studies have shown that children who exhibit frequent aggressive behavior report more hostile attributions of intent than do children who do not act aggressively often (e.g., Dodge, 1980; Guerra & Slaby, 1989), and in normative samples of children, hostile attribution tendencies correlated positively with aggression (e.g., Dodge & Coie, 1987; Runions & Keating, 2007). Although a

meta-analysis indicated that the association between hostile attribution tendencies and aggressive behavior is robust, significant differences in effect sizes exist between studies (de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Therefore, there are presumably some children who are more likely to respond with aggressive behavior when they attribute hostile intent, whereas other children are unlikely to engage, or may even inhibit, aggressive responses when they attribute hostile intent. The present research sought to understand the conditions in which attributions of hostile intent are likely to lead to aggression, and for whom these hostile attributions are unlikely to precede aggressive behavior.

### **Step 3: Revenge Goals**

After interpreting the situation, step 3 of the model proposed that children select a goal or desired outcome for the situation. A common goal of the victim of an aggressive act is the desire to inflict harm on the aggressor. Anger is usually the primary emotion driving aggressive responses; however, these responses may also result from a desire for vengeance. In the literature, vengeance has been defined as “the infliction of harm in return for a perceived wrong” (Stuckless & Goranson, 1992). Compared to anger-driven responses, vengeful or revenge-seeking responses are usually characterized by an intrapersonal or self-focus, suggesting that one seeks revenge because the transgression is “personal.” Negative self-conscious emotions such as shame and humiliation may characterize the victim’s feelings that precede an act of revenge, as these emotions damage one’s self esteem. Studies have shown that revenge-driven responses are not the same as anger-driven responses to aggression, as one is more often to seek vengeance when the offense induced a threat to oneself, which elicited intense negative emotions

and rumination (Elshout, Nelissen, & van Beest, 2014). Although anger may drive many aggressive behaviors, we sought to assess how the desire to seek vengeance paired with emotion dysregulation may influence the likelihood to aggress.

### **Step 5: Self-Efficacy for Aggression**

We were also interested in step five of this model. In this step, possible responses to the situation are generated and evaluated in terms of anticipated outcomes, relations to goals, and self-efficacy for performing the response (Lemerise & Arsenio, 2000). A child's self-efficacy for aggressive behavior reflects their beliefs on ability and confidence to engage in aggression (Bandura, 1986; Egan, Monson, & Perry, 1998). For example, if a child in step 2 has interpreted the intent of an action as hostile, he or she may consider retaliating with an act of aggression. However, if the child is not confident that he or she can aggress successfully, then they may reject this response in fear of failure. Results from a study evaluating a SIP instrument measuring each sequential SIP step showed that several SIP steps were correlated with self-reported general aggression. The study not only found correlations between aggression and hostile intent attribution, but also self-reported feelings of competency (van Rest et al, 2014). Additional evidence has shown that aggressive cognitions (e.g., self-efficacy to aggress) are more strongly associated with aggressive behavior for children who have difficulties regulating their anger than those who can effectively manage their anger (Roos, Hodges, Peets, & Salmivalli, 2016).

Despite Crick and Dodge's (1994) comprehensive model, the connections between domain-specific cognitions and emotions, and the connection to their related behaviors are not strong, which indicated that there are other factors likely to alter the

behavioral expression of aggressogenic thought. To date, only a few studies have investigated whether the expression of aggressogenic cognitions depends on other factors beyond basic distinctions such as gender and age. Indeed, theorizing by Read et. al (2010) as well as by Keltner et al. (2003) have begun to posit additional conditions that moderate aggressogenic thought-behavior associations, specifically the degree to which children have difficulties regulating their anger as well as their degree of inhibitory control.

### **Cognitions**

Read et. al (2010) presented a neural network model of human personality that provided an evolutionary analysis of motivation. According to their model, there are two levels of motivational systems: approach and avoidance. The approach system governs response to rewarding stimuli, whereas the avoidance system governs response to punishment and aversive stimuli. Regarding aggressive behavior, aggressive cognitions are most likely to be expressed when the approach system is activated. Each broad system encompasses and moderates a set of more specific motives. These systems interact with an overarching control system that regulates the expression of motivation-driven actions. They asserted that the avoidance system produces behavioral inhibition or withdrawal, and that this system is likely activated by feelings of distress or fear. From this model, Roos et al. (2016) postulated that the approach system should be activated for the expression of aggressogenic cognitions, and that emotions such as anger, frustration, and irritability should activate the approach system. To date, there have been limited tests, and therefore limited evidence, to support Read et al.'s hierarchical model.

Keltner et al. (2003) also considered the approach-avoidance system as a basis to explain why individual differences in power alter thought-behavior associations. Like Read et al. (2010), Keltner et al. theorized that the behavioral approach system regulates aggression, in that the approach system enhances the cognition-behavior associations. Keltner et al. also considered how a perceived threat to power can influence cognitive processes, such that individuals who experience threat-related negative emotions were found to think more methodically, while those who did not were found to act more quickly and impulsively. As it relates to our study, thought-behavior associations are hypothesized to be exacerbated by the described threat-related emotions (anger). In contrast, they predicted that individuals with less power interpret ambiguous events as more threatening and more carefully scrutinize the actions of others. Low power individuals are also more likely to have difficulty regulating depressed affect and would likely exhibit avoidance, withdrawal, and inhibited behaviors, while also reacting to these events less impulsively. Therefore, we hypothesized that those who experience these negative emotions would be less likely to act aggressively when threatened, as well as be less likely to act upon any aggressogenic social cognition.

## **Emotions**

We must also highlight the importance of specific negative emotions that are relevant in terms of aggression. Despite their sound social information processing model, Crick and Dodge (1994) acknowledged the need to consider emotion when understanding children's interpretation, motivation, and behavior responses in social situations. Lemerise and Arsenio (2000) took Crick and Dodge's (1994) model and incorporated emotion processes to differentiate between emotions and cognitions in social information

processing. These emotion-related processes provide affective cues that serve as sources of information that must be encoded and interpreted. For example, one's own anger as well as anger cues presented by others can influence the interpretation of and reaction to ambiguous social interactions. Anger and associated emotions (i.e. frustration, irritability), are theorized to activate the approach system and may increase the likelihood of aggressive actions. Alternatively, individuals who experience depressed affect may exhibit avoidance and withdrawal, which may activate the avoidance system and therefore could be less likely to exhibit aggressive behaviors. We theorized that one's ability to regulate these emotions impact the expression of aggression.

### **Inhibitory Control**

While anger dysregulation may moderate the relationship between cognitions and aggression, the presence of anger may not always drive children to act on aggressogenic thought. As mentioned above in Read et al.'s (2010) model of motivational systems, there is an overarching control system (e.g., effortful control or inhibitory control) that influences the expression of behavior, which interacts with motivational tendencies. Read et al. asserted that although there is an interplay between anger and aggressogenic thought, effortful control further qualifies whether those cognitions are acted upon. Effortful control reflects voluntary regulatory capacities that individuals can deploy as needed (Eisenberg & Morris, 2002), and evidence has shown that the ability to control oneself inhibits the expression of aggression (Runions & Keating, 2010). Previous studies have highlighted the role of effortful control in the presentation of aggressive behaviors. Roos et al. (2016) examined the effects of anger and effortful control on aggressogenic thought-behavior associations, and found the effects were strongest for children who

were high in anger and low in effortful control. It was under these conditions that aggressive cognitions were found to most strongly predict aggressive behavior. Thus, there is an interaction between a domain-specific motivational system (i.e. aggressive cognitions), the approach-avoidance system (i.e. anger), and the system of control that together influence the presentation of aggressive behaviors. While some studies have assessed the broader construct of effortful control, which consists of multiple facets of self-regulation, the present study explored the aspect of effortful control known as inhibitory control. Inhibitory control is a cognitive process that allows an individual to suppress their impulsive behavioral responses to an external stimulus, in order to select a more appropriate action.

## Chapter III

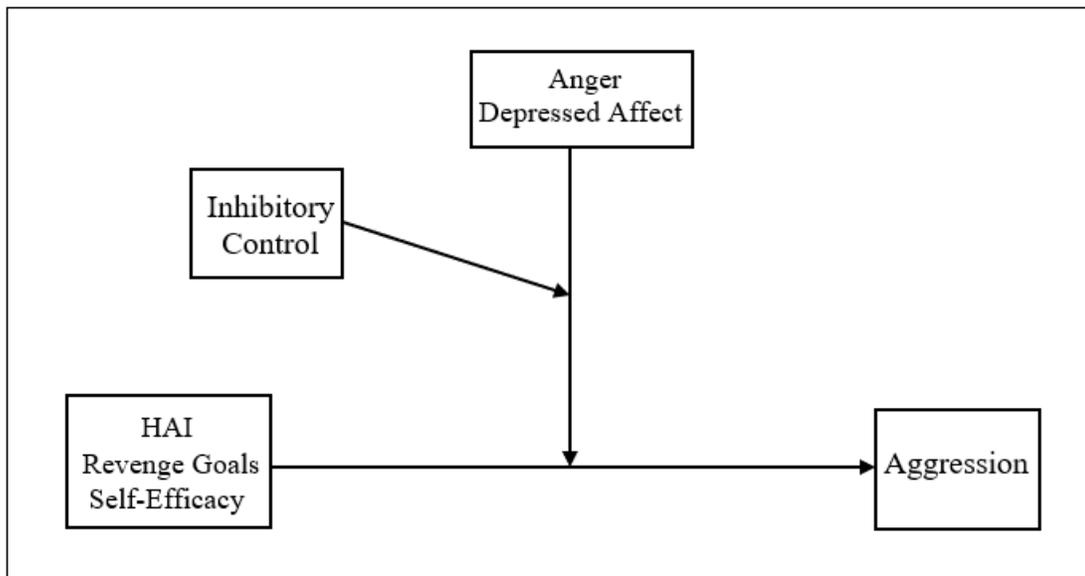
### **HYPOTHESES**

The present study aimed to evaluate the associations between three aggressogenic cognitions -- hostile attributions, revenge goals, and self-efficacy – and aggression, as well as whether anger dysregulation, depressed-affect dysregulation, and inhibitory control qualify these associations. This study sought to evaluate the replicability of the findings reported by Roos et al. (2016) and Runions and Keating (2010) and to extend their work by expanding the social cognitions studied in relation to aggressive behavior.

Figure 1 depicts an adaptation of Hayes' Process Model 3 Conceptual Diagram as it pertains to our study. In general, we hypothesized that anger dysregulation and depressed-affect dysregulation serve as moderators between aggressogenic cognitions (e.g. hostile attribution of intent, revenge goals, self-efficacy to aggress) and aggression. As anger and depressed affect alter the degree in which cognitions influence the presence of aggressive behaviors, we hypothesized that another moderator one processing level up also impacts the strength of this relationship – inhibitory control.

**Figure 1**

*Adaptation of Hayes' Process Model of a 3-Way Interaction*



Driven by prior theory and research, it was hypothesized that:

1. The relationship between aggressogenic cognitions and aggression will be strongest under conditions of high anger dysregulation and low inhibitory control, and those who fit these conditions will be the most likely to exhibit aggressive behaviors.
2. The relationship between aggressogenic cognitions and aggression will be weakest under conditions of high depressed-affect dysregulation and high inhibitory control, and those who fit these conditions will exhibit the least aggressive behaviors.

## Chapter IV

### **METHODS**

#### **Participants**

Out of 423 5<sup>th</sup> and 6<sup>th</sup> graders from a Long Island middle school, 362 boys (n = 195) and girls (n = 167) participated in this study. Per American Community Survey census data, ethnicity demographics of this school district consisted of 70% White, 18% Hispanic, 8% Asian, and 2% Black. Median Household income was \$98,360. (U.S. Census Bureau, 2018). Parents were mailed home a letter explaining the purpose and procedures of study and provided passive consent for his or her child's participation in the study (Appendix A). Students whose parents provided passive consent and were not absent on the day of testing were read an assent statement outlining the purpose of the study, offering students the ability to ask questions and emphasizing their right to withdraw from the study at any time (Appendix B). Teachers of 5<sup>th</sup> and 6<sup>th</sup> grade students were also recruited to participate to report on the students in their homeroom classes. Data were collected in May of the 2018-2019 school year, and homeroom teachers taught the same cohort of students for two periods (86 minutes) daily. Homeroom teachers were chosen since students spent more time in their class than in single-period subject classes, and that they had already known the majority of these students for 9 months at the time of the study. Data for 19 out of the 20 homeroom classes recruited were collected.

#### **Measures**

Questionnaires were created for the student participants using the Qualtrics online survey software (Qualtrics Survey Software, 2020), to assess emotion dysregulation, hostile attributions of intent, revenge goals, and self-efficacy for aggression. Paper copy

grids were distributed to homeroom teachers to assess each child's anger dysregulation, depressed-affect dysregulation, inhibitory control, and aggression.

## **Variables**

### **Hostile Attributions of Intent**

Hostile attributions of intent were measured using vignettes selected from the "Attributions and Coping Questionnaire" (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, and Booth-LaForce, 2006). Participants were administered an online questionnaire that presents four hypothetical, ambiguous scenarios, and items showed satisfactory internal reliability after standardization (Cronbach's alpha = .68). (Appendix C). For example: "Imagine that you are sitting at the lunch table at school eating lunch. You look up and see another kid coming over to your table with a carton of milk. You turn around to eat your lunch, and the next thing that happens is that the kid spills milk all over your back. The milk gets your shirt all wet." Participants were then asked to assess the intentionality of the perpetrator (i.e. "Rate how likely is it that the kid did this by accident"; "Rate how likely do you think this kid was trying to be nice versus be mean"). Participants responded using four-point scales for each question, ranging from "definitely by accident" to "definitely on purpose", and "definitely mean" to "definitely nice" respectively. In addition, items from the *Revenge Goals* questionnaire also assessed hostile attributions of intent in a similar manner, but required participants to respond to the intentionality of the perpetrator in six hypothetical-yet-unambiguous vignettes (i.e. "Rate how likely this kid meant to hurt you.") Participants responded using a four-point scale ranging from "definitely did not mean to hurt me" to "definitely meant to hurt me." These vignettes were selected from McDonald (2008) and showed satisfactory internal

reliability (Cronbach's alpha range = .70 - .95). Reliability coefficients were conducted to assess the internal reliability of each variable after standardization of items. The items assessing hostile attributions of intent in unambiguous situations yielded an unacceptable reliability coefficient (Cronbach's alpha = -.93), and therefore this scale was removed from further analysis.

### **Revenge Goals**

Revenge goals were measured using vignettes selected from McDonald (2008). This cognition was assessed under two conditions, revenge goals in response to ambiguous situations, and revenge goals in response to unambiguous situations. Participants were administered an online questionnaire that presents six hypothetical, unambiguous scenarios (Appendix D). For example: "A kid in your class is having a party for their birthday. The kid has invited a lot of people from your class. When you ask if you are invited to the party, the kid says, 'No. Only cool kids are invited to my party.'" Participants were first asked to choose what their goal would be for the situation (i.e. What would your goal be in the situation). Participants were then presented with three goals and asked to choose one; two of which were related to revenge (ex: "I would try to get back at the person"; "I would try to hurt the person like they hurt me"), and one that was related to harm avoidance (ex: I would try to avoid getting hurt more). All vignettes were developed by McDonald (2008) with ecological validity in mind and showed satisfactory internal reliability (Cronbach's alpha range = .70 - .95). In addition, items from the *Hostile Attributions of Intent* questionnaire also assessed revenge goals in a similar manner, but required participants to choose a goal for four hypothetical yet ambiguous vignettes (i.e. "How would you deal with (or handle) this situation if it

happened to you?”). These vignettes were selected from the “Attributions and Coping Questionnaire” (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, and Booth-LaForce, 2006). Participants were given two goals and asked to choose one; similarly, one goal was related to revenge (ex: I’d pour milk in the kid’s back the next day), while the other goal was related to harm avoidance (ex: “I’d leave the lunchroom”). The internal reliabilities after standardization of items were acceptable for both revenge goals in ambiguous situations (Cronbach’s alpha = .64) and revenge goals in unambiguous situations (Cronbach’s alpha = .87).

### **Self-Efficacy for Aggression**

Self-Efficacy for Aggression was measured using items selected from a questionnaire by Egan, Monson, and Perry (1998) assessing social cognitions about aggression. Participants were administered an online 10-item questionnaire, which asked them to rate how well they agree to each statement (Appendix E). For example, “Fighting is easy.” Participants respond using a four-point scale, ranging from “Strongly Disagree” to “Strongly Agree.” These scales showed good internal reliability (Cronbach's alpha range = .78 - .83). In this study, the internal reliability after standardization of items was acceptable (Cronbach’s alpha = .80).

### **Anger Dysregulation**

Anger dysregulation was assessed using three different methods. One method used a peer nominations approach, presenting items selected from a questionnaire from Peets, Isaacs, & Hodges, (2007); (Appendix F, Questions 1-3). Each participant was administered a 10-item online questionnaire, and three of the ten items assessed anger dysregulation. They were presented with three statements and asked to determine how

much each statement applied to one of their named classmates. For example, “He/she gets angry easily.” Participants answered each statement for each one of their classmates using a three-point scale (i.e. “Not at all”, “some”, “a lot”). The internal reliability after standardization of items was acceptable (Cronbach’s alpha = .70). The second method that assessed anger dysregulation is through a self-report online questionnaire, where they were presented with the same three statements that were presented to their peers (Appendix H, Questions 1-3). They were asked to determine how much each statement applied to themselves and will answer each statement using the same three-point scale. These items show good face and construct validity. Lastly, teachers were asked to rate each of their students’ anger dysregulation based on their observations and impressions throughout the year (Appendix G, Questions 1-3). Teachers were provided with a paper grid with the students in their homeroom class across the top, and the statements down the left side of the page. The three statements assessing anger dysregulation are also mirrored from those presented to the peers, however, the teachers responded to each statement using a four-point scale ranging from “Strongly Disagree” to “Strongly Agree.” Each student and teacher only assessed the students in their homeroom class, rather than assessing the whole grade. The internal reliability after standardization of items was acceptable (Cronbach’s alpha = .75).

### **Depressed-Affect Dysregulation**

Depressed-Affect Dysregulation was assessed using the same three methods explained above. One method used a peer nominations approach, using items selected from the questionnaire from Peets, Isaacs, & Hodges (2007); (Appendix F, Questions 4-6). They were presented with three statements and asked to determine how much each

statement applied to one of their named classmates. For example, “he/she has a hard time cheering up when sad.” Participants answered each statement for each one of their classmates using a three-point scale (i.e. “Not at all”, “some”, “a lot”). The internal reliability after standardization of items was acceptable (Cronbach’s alpha = .67). The second method that assessed depressed-affect dysregulation was through a self-report online questionnaire, from which they were presented with the same three statements that were presented to their peers (Appendix H, Questions 4-6). They were asked to determine how much each statement applied to themselves and answered each statement using the same three-point scale. These items show good face and construct validity. Lastly, teachers were asked to rate each of their students’ depressed-affect dysregulation based on their observations and impressions throughout the year (Appendix G, Questions 4-6). These items were also included on the paper grid used to assess anger dysregulation. The three statements that the teachers were mirrored from those presented to the peers, however, they were asked to respond to each statement using a four-point scale ranging from “Strongly Disagree” to “Strongly Agree.” Each student and teacher only assessed the students in their homeroom class, rather than assessing the whole grade. The internal reliability after standardization of items was respectable (Cronbach’s alpha = .81).

### **Inhibitory Control**

Inhibitory control was measured on the same paper grid that assessed anger dysregulation, depressed-affect dysregulation, and aggression, using items selected from the “Early Adolescent Temperament Questionnaire-Revised (EATQ-R),” (Ellis & Rothbart, 2001); (Appendix G, Questions 11-15). On the same grid, teachers were presented with five items to assess each student’s inhibitory control. For example,

“He/she has a hard time waiting for his/her turn to speak.” Teachers responded to each statement using a four-point scale ranging from “Strongly Disagree” to “Strongly Agree.” Each teacher only assessed the students in their homeroom class, rather than assessing the whole grade. The internal reliability after standardization of items was acceptable (Cronbach’s alpha = .72).

### **Aggression**

Aggression was assessed using the same two methods that assessed anger dysregulation and depressed-affect dysregulation. One method used a peer nominations approach, using items selected from the questionnaire from Peets, Isaacs, & Hodges, (2007); (Appendix F, Questions 7-10). Participants were presented with four statements and asked to determine how much each statement applied to one of their named classmates. Each of the four statements measured a different type of aggression, including *physical aggression* (i.e. “He/she hits and pushes people around.”), *verbal aggression* (i.e. “He/she makes fun of people.”), *relational aggression* (i.e. “When he/she is mad at a person, he/she ignores them or stops talking to them), and a general, indirect item of aggression (i.e. “He/she is just plain mean.”). Participants answered each statement for each one of their classmates using a three-point scale (i.e. “Not at all”, “some”, “a lot”). These items showed good face and construct validity. The second method assessing aggression required teachers to rate each of their students based on their observations and impressions throughout the year (Appendix G, Questions 7-10). These items were presented on the same paper grid used to assess anger dysregulation, depressed-affect dysregulation, and inhibitory control. The four statements were mirrored from those presented to the peers, however, teachers responded to each statement using a

four-point scale ranging from “Strongly Disagree” to “Strongly Agree.” Each student and teacher only assessed the students in their homeroom class, rather than assessing the whole grade. The internal reliability after standardization of items was acceptable (Cronbach’s alpha = .72).

## Chapter V

### RESULTS

#### **Preliminary Analyses/Data Reduction**

As discussed above, the scale for hostile attributions of intent for unambiguous situations was dropped due to poor internal reliability, and analyses of descriptive statistics of the original study variables revealed that there was relatively little variation for responses on hostile attributions of intent in unambiguous scenarios (Table 1). Additionally, because we assessed anger dysregulation, depressed-affect dysregulation, and aggression through multiple sources of information, we inspected the correlations among these measures reportedly assessing the same construct. This was done to inform decisions on what measures to combine across reporters while keeping some measures distinct. Due to the strong correlation between peer- and teacher-reported aggression (.49,  $p < .001$ ), we standardized each scale and averaged them to create a composite aggression scale, referred to as “Other-Reported Aggression” (Othagg). We collected three sources of data for anger dysregulation and depressed-affect dysregulation (self, peer, and teacher). The correlation between peer- and teacher-reported anger dysregulation (.48,  $p < .001$ ), informed the decision to standardize each scale and average them to create a composite “other” reported anger dysregulation. Likewise, due to the correlation between peer- and teacher-reported depressed-affect dysregulation (.37,  $p < .001$ ), we standardized each scale and averaged them to create a composite “other” depressed-affect dysregulation scale. However, due to the weaker correlation between the self- and the peer- and teacher-reports of both anger dysregulation (.15,  $p = .004$ ; .19,  $p < .001$ ) and

depressed-affect dysregulation (.28,  $p < .001$ ; .22,  $p < .001$ ), we kept the self-report measures of emotional dysregulation distinct.

**Table 1***Descriptive Statistics of Original Study Variables*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Possible Range	Min	Max
Hostile Attributions of Intent (Ambiguous)	362	3.03	0.42	1.00-4.00	1.00	4.00
Hostile Attributions of Intent (Unambiguous)	362	2.47	0.24	1.00-4.00	1.67	3.50
Revenge Goals (Ambiguous)	362	1.17	0.25	1.00-2.00	1.00	2.00
Revenge Goals (Unambiguous)	362	1.41	0.38	1.00-2.00	1.00	2.00
Self- Efficacy	362	2.05	0.51	1.00-4.00	1.00	4.00
Self-Reported Anger Dysregulation	362	1.93	0.52	1.00-3.00	1.00	3.00
Self-Reported Depressed-Affect Dysregulation	362	1.85	0.56	1.00-3.00	1.00	3.00
Peer-Reported Anger Dysregulation	423	1.64	0.30	1.00-3.00	1.06	2.66
Peer-Reported Depressed-Affect Dysregulation	423	1.59	0.27	1.00-3.00	1.00	2.50
Peer-Reported Aggression	423	1.40	0.25	1.00-3.00	1.00	2.40
Teacher-Reported Anger Dysregulation	397	1.71	0.62	1.00-4.00	1.00	4.00
Teacher-Reported Depressed-Affect Dysregulation	397	1.78	0.66	1.00-4.00	1.00	4.00
Teacher-Reported Aggression	397	1.43	0.47	1.00-4.00	1.00	3.00
Inhibitory Control	397	3.12	0.56	1.00-4.00	1.00	4.00

Table 2 provides descriptive statistics and correlations of study variables, now including the averaged and standardized composites. Gender correlated with six of our study variables. Compared to girls, boys scored lower on inhibitory control and depressed-affect dysregulation. Boys scored higher than girls on all four measures of cognition. Grade correlated with three of our study variables. Older children had greater difficulty regulating their anger and depressed affect (as perceived by others) but were less likely to attribute hostile intent under ambiguous situations than younger children. Due to these sundry gender and grade differences, they were included as covariates in all subsequent regression analyses.

**Table 2***Descriptive Statistics and Correlations for Study Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Sex	.53	.50	—										
2. Grade	.52	.50	-.06	—									
3. Inhibitory Control	.00	.61	-.32***	.00	—								
4. Self-Reported Anger Dysregulation	1.93	.52	-.03	.03	-.15**	—							
5. Other-Reported Anger Dysregulation	0.01	.86	.07	.11*	-.51***	.19***	—						
6. Self-Reported Depressed Affect Dysregulation	1.85	.56	-.16**	.05	-.11*	.34***	.21***	—					
7. Other-Reported Depressed Affect Dysregulation	.00	.83	-.08	.12*	-.32***	.14*	.71***	.30***	—				
8. Hostile Attributions of Intent (Ambiguous)	3.03	.42	.15**	-.15**	-.06	.17**	.01	.05	-.06	—			
9. Revenge Goals (Ambiguous)	1.17	.25	.31***	-.06	-.15**	.21***	.09	.08	-.06	.40***	—		
10. Revenge Goals (Unambiguous)	1.41	.38	.25***	-.07	-.18**	.23***	.08	-.01	-.01	.36***	.64***	—	
11. Self-Efficacy	2.05	.51	.19***	-.07	-.13*	.31***	.06	.11*	-.06	.32***	.47***	.49***	—
12. Aggression Composite ( <i>Othagg</i> )	.00	.86	.07	.06	-.50***	.15**	.67***	.07	.40***	.07	.15**	.12*	.14*

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

## **Analytic Plan**

A series of hierarchical multiple regressions was performed. Each computed regression consisted of one cognition, one type of emotion dysregulation, and one source of information for each type of emotion dysregulation, totaling 16 hierarchical multiple regressions. In each analysis, our composite aggression scale (othagg) served as the dependent variable. In the first step of each analysis, sex and grade were entered as control variables. In the second step, the main effects of inhibitory control, one cognition, and one source of emotion dysregulation were entered. In addition, the other type of emotion dysregulation reported by the same source was entered, as the two were strongly related to one another as indicated in the table of correlations. For the third step, all two-way interactions of the main effects entered in step two were entered (e.g. inhibitory control x cognition, inhibitory control x emotion dysregulation, and cognition x emotion dysregulation). In the fourth and final step, we evaluated the three-way interaction between inhibitory control, the cognition, and the specified emotion dysregulation. It should be noted that, although 3 two-way interactions must be included before testing the three-way interaction, only 2 of the two-way interactions that comprised the three-way interaction were of interest to us (inhibitory control x cognition and cognition x emotion dysregulation). Therefore, we will not be discussing the effect of the third two-way interaction involving inhibitory control and emotion dysregulation.

Tables 2 through Table 5 summarize the results from these analyses, with each table reporting the results of the interactions with each of the three cognitions about aggression. Analyses indicate that neither gender nor grade was significantly related to aggression in any of the four sets of hierarchical multiple regressions.

### Inhibitory Control x Self-Reported Anger Dysregulation x Cognition

In Table 3, of the main effects entered in step two, inhibitory control was the most powerfully associated with aggression. In particular, children who were reported to have low levels of inhibitory control exhibited more aggression. Self-reported anger dysregulation was unrelated to aggression, and of the four cognition conditions, only revenge goals in ambiguous situations were independently associated with greater levels of aggressive behavior. There was a significant 2-way interaction observed between anger dysregulation and hostile attributions of intent in ambiguous situations.

**Table 3**

*Hierarchical Multiple Regressions of Inhibitory Control, Self-Reported Anger Dysregulation, and Cognitions on Other-Reported Aggression, Controlling for Self-Reported Depressed-Affect Dysregulation*

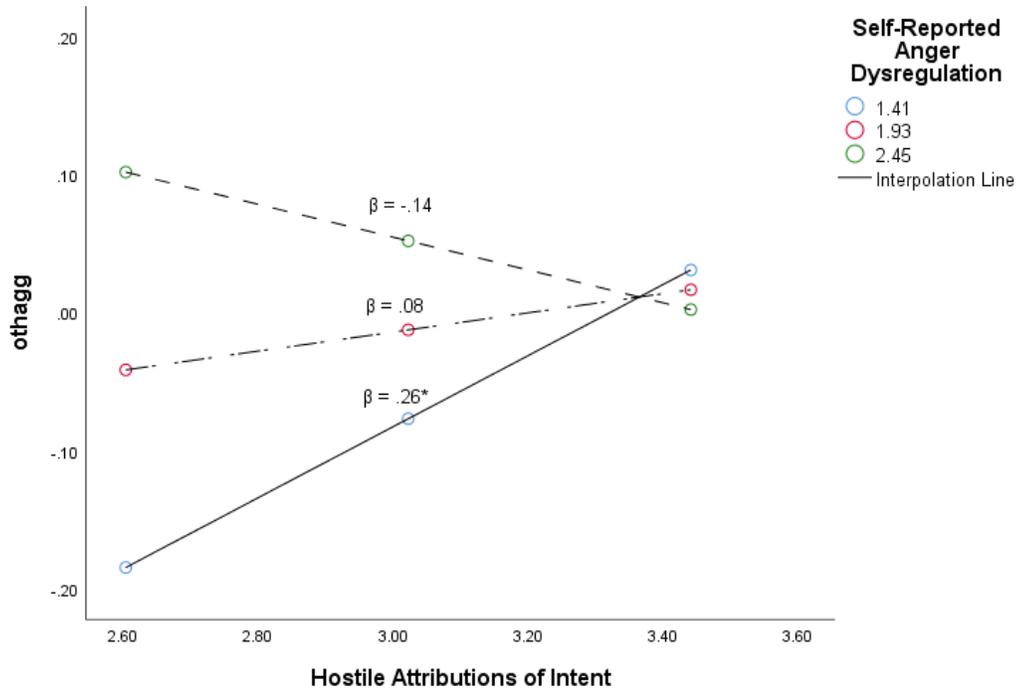
	Hostile Attributions of Intent	Revenge Goals (Ambiguous)	Revenge Goals (Unambiguous)	Self-Efficacy
	$\beta$			
Covariates				
Sex	.08			
Grade	.06			
$\Delta R^2$	.008			
Main Effects				
Inhibitory Control	-.47***	-.47***	-.47***	-.47***
Self-Reported Anger Dysregulation	.07	.06	.06	.05
Cognition	.05	.10*	.04	.08
Controlling for Self- Reported Depressed- Affect Dysregulation	.01	.00	.01	.01
$\Delta R^2$	.221***	.228***	.221***	.225***
2-Way Interactions				
Inhibitory Control x Anger Dysregulation	-.30	-.24	-.21	-.18
Inhibitory Control x Cognition	-.31	-.10	-.07	-.13
Anger Dysregulation x Cognition	-.85*	-.18	.03	.23
$\Delta R^2$	.014	.004	.003	.006
3-Way Interaction				
Inhibitory Control x Anger Dysregulation x Cognition	-.57	-.65	-.68	-.19
$\Delta R^2$	.000	.001	.001	.000

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Simple slopes analyses were conducted using Hayes' (2013) PROCESS module to evaluate the links between hostile attributions of intent in ambiguous situations and aggression at different levels of anger dysregulation (high: +1 SD and low: -1 SD). Figure 2 displays findings that a significant positive association between hostile attributions of intent in ambiguous situations and aggression only exist under the condition of low anger dysregulation, which is inconsistent with our hypotheses ( $\beta = .26$ ,  $p = .038$ ). The other 2-way interaction of interest and the 3-way interaction were not statistically significant.

**Figure 2**

*Two-Way Interaction Between Self-Reported Anger Dysregulation and Hostile Attributions of Intent on Other-Reported Aggression*



### Inhibitory Control x Other-Reported Anger Dysregulation x Cognition

As shown in Table 4, both inhibitory control and other-reported anger dysregulation were significantly associated with aggression, while only revenge goals in ambiguous situations and self-efficacy to aggress were independently associated with greater levels of aggressive behavior. None of the 2-way interactions we were interested in were statistically significant, however, the 3-way interaction was significant involving all four cognition conditions.

**Table 4**

*Hierarchical Multiple Regressions of Inhibitory Control, Other-Reported Anger Dysregulation, and Cognitions on Other-Reported Aggression, Controlling for Other-Reported Depressed-Affect Dysregulation*

	Hostile Attributions of Intent	Revenge Goals (Ambiguous)	Revenge Goals (Unambiguous)	Self-Efficacy
	$\beta$			
Covariates				
Sex	.08			
Grade	.06			
$\Delta R^2$	.01			
Main Effects				
Inhibitory Control	-.17***	-.17**	-.17**	-.17**
Other-Reported Anger Dysregulation	.64***	.63***	.64***	.63***
Cognition	.05	.08*	.05	.08*
Controlling for Other- Reported Depressed- Affect Dysregulation	-.09	-.08	-.09	-.08
$\Delta R^2$	.46***	.46***	.46***	.46***
2-Way Interactions				
Inhibitory Control x Anger Dysregulation	.15**	.15**	.15**	.16**
Inhibitory Control x Cognition	-.05	-.19	-.13	-.31
Anger Dysregulation x Cognition	.00	-.05	-.00	-.03
$\Delta R^2$	.02*	.02*	.02*	.02**
3-Way Interaction				
Inhibitory Control x Anger Dysregulation x Cognition	-1.04**	-.67*	-.70**	-.39*
$\Delta R^2$	.01**	.01*	.02**	.01*

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Simple slopes analyses were conducted using Hayes' (2013) PROCESS module to evaluate the links between cognitions and aggression at different combinations of inhibitory control and anger dysregulation (high: +1 SD and low: -1 SD). Inconsistent with our hypotheses, Figure 3 indicates that hostile attributions of intent in ambiguous situations are only significantly positively associated with aggression under conditions of low anger dysregulation and high inhibitory control ( $\beta = .35, p = .025$ ).

**Figure 3**

*Three-Way Interaction Between Inhibitory Control, Other-Reported Anger Dysregulation, and Hostile Attributions of Intent on Other-Reported Aggression*

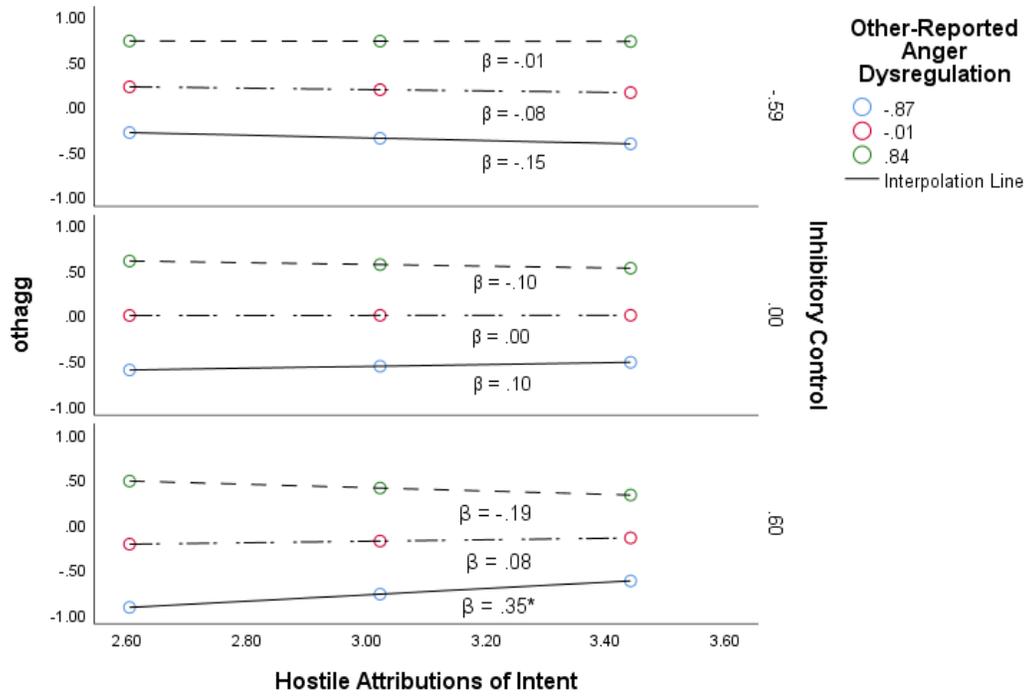
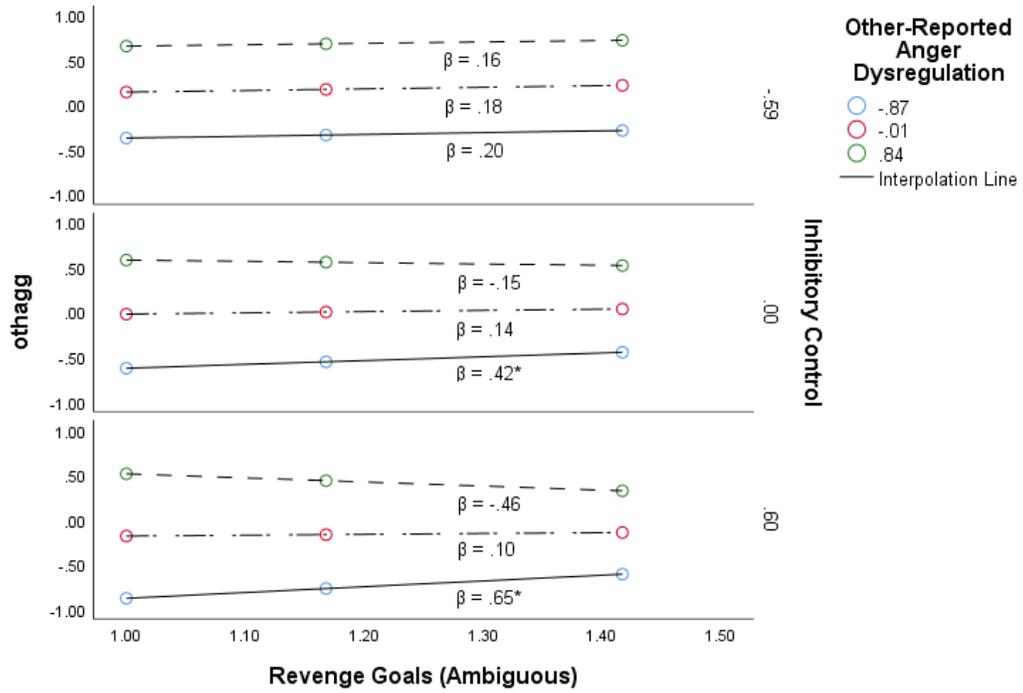


Figure 4 displays that for those who are low in anger dysregulation, the association between revenge goals in ambiguous situations and aggression is significant and strengthens as levels of inhibitory control increase (Average Inhibitory Control:  $\beta = .42$ ,  $p = .036$ ; High Inhibitory Control:  $\beta = .65$ ,  $p = .029$ ). These findings are also inconsistent with our hypotheses.

**Figure 4**

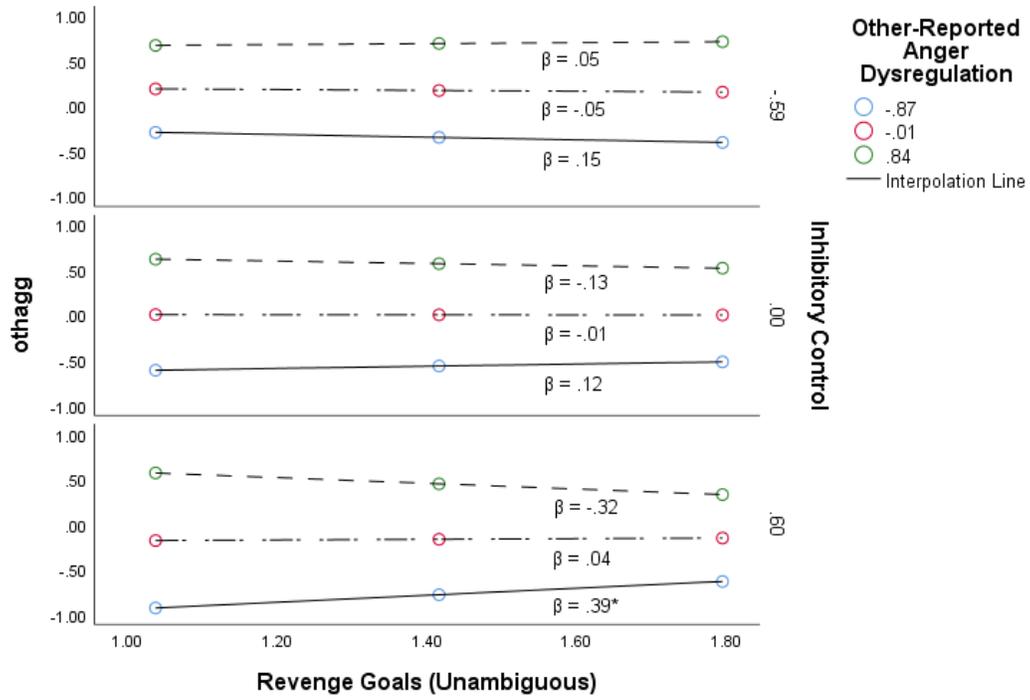
*Three-Way Interaction Between Inhibitory Control, Other-Reported Anger Dysregulation, and Revenge Goals in Ambiguous Situations on Other-Reported Aggression*



In Figure 5, the association between revenge goals in unambiguous situations and aggression are only significantly positively associated under conditions of low anger dysregulation and high inhibitory control ( $\beta = .39$ ,  $p = .028$ ), findings that are again inconsistent with our hypotheses.

**Figure 5**

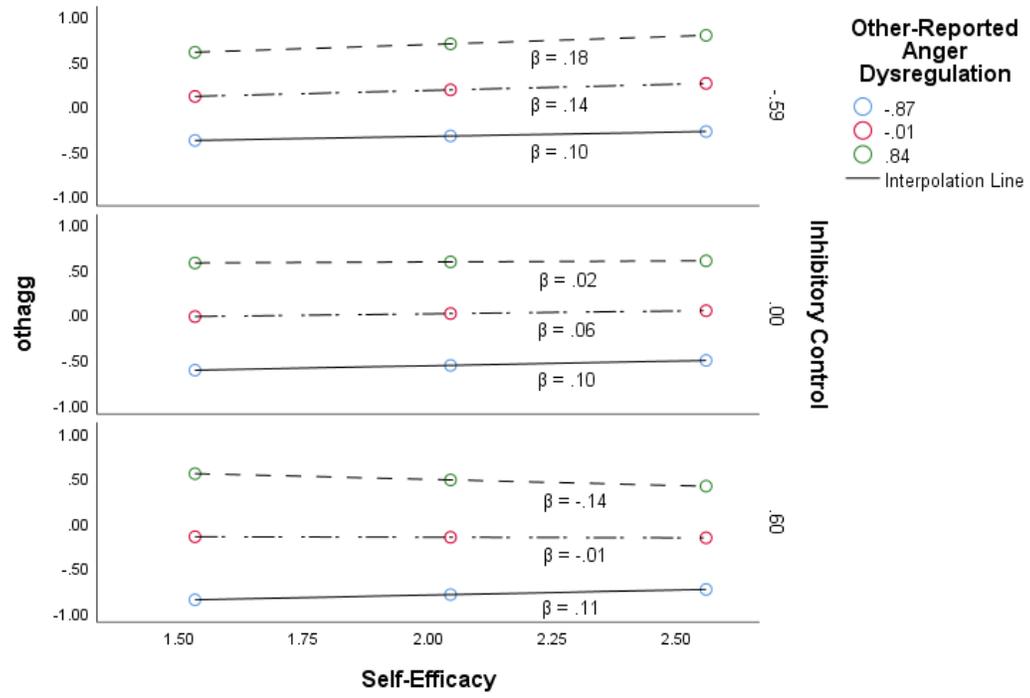
*Three-Way Interaction Between Inhibitory Control, Other-Reported Anger Dysregulation, and Revenge Goals in Unambiguous Situations on Other-Reported Aggression*



As shown in Figure 6, the association between self-efficacy and aggression is only marginally positively significant under conditions of high anger dysregulation and low inhibitory control ( $\beta = .18, p = .057$ ), consistent with our original hypotheses.

**Figure 6**

*Three-Way Interaction Between Inhibitory Control, Other-Reported Anger Dysregulation, and Self-Efficacy to Aggress on Other-Reported Aggression*



### Inhibitory Control x Self-Reported Depressed-Affect Dysregulation x Cognition

In Table 5, inhibitory control was significantly and independently associated with aggressive behaviors. Self-reported depressed-affect dysregulation was unrelated to aggression. Similarly, none of the cognitions were associated with aggression. In addition, none of the 2-way interactions or the 3-way interaction were statistically significant.

**Table 5**

*Hierarchical Multiple Regressions of Inhibitory Control, Self-Reported Depressed-Affect Dysregulation, and Cognitions on Other-Reported Aggression, Controlling for Self-Reported Anger Dysregulation*

		Hostile Attributions of Intent	Revenge Goals (Ambiguous)	Revenge Goals (Unambiguous)	Self- Efficacy
		$\beta$			
Covariates					
	Sex	.08			
	Grade	.06			
	$\Delta R^2$	.01			
Main Effects					
	Inhibitory Control	-.48***	-.48***	-.47***	-.48***
	Self-Reported Depressed- Affect Dysregulation	.01	.00	.01	.01
	Cognition	.05	.10	.04	.08
	Controlling for Self- Reported Anger Dysregulation	.07	.06	.06	.05
	$\Delta R^2$	.22***	.23***	.22***	.23***
2-Way Interactions					
	Inhibitory Control x Depressed-Affect Dysregulation	-.09	-.06	-.06	-.01
	Inhibitory Control x Cognition	-.22	-.15	-.12	-.19
	Depressed-Affect Dysregulation x Cognition	-.07	-.37	-.13	.22
	$\Delta R^2$	.00	.00	.00	.00
3-Way Interaction					
	Inhibitory Control x Depressed-Affect Dysregulation x Cognition	-1.42	-1.07	-1.07	-.91
	$\Delta R^2$	.00	.00	.01	.01

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### Inhibitory Control x Other-Reported Depressed-Affect Dysregulation x Cognition

As shown in Table 6, inhibitory control was again the most powerfully associated with aggression. Other-reported depressed-affect dysregulation was not significantly related to aggressive behaviors, while only revenge goals in ambiguous situations and self-efficacy to aggress were independently associated with greater levels of aggression. None of the two-way interactions were statistically significant, however, with the exception of hostile attributions of intent in ambiguous situations, the three-way interactions between three of the cognitions were significantly related to aggressive behaviors.

**Table 6**

*Hierarchical Multiple Regressions of Inhibitory Control, Other-Reported Depressed-Affect Dysregulation, and Cognitions on Other-Reported Aggression, Controlling for Other-Reported Anger Dysregulation*

		Hostile Attributions of Intent	Revenge Goals (Ambiguous)	Revenge Goals (Unambiguous)	Self- Efficacy
		$\beta$			
Covariates					
	Sex	.08			
	Grade	.06			
	$\Delta R^2$	.01			
Main Effects					
	Inhibitory Control	-.17***	-.17**	-.17**	-.17**
	Other-Reported Depressed- Affect Dysregulation	-.09	-.08	-.09	-.08
	Cognition	.05	.08*	.05	.08*
	Controlling for Other- Reported Anger Dysregulation	.64***	.63***	.64***	.63***
	$\Delta R^2$	.46***	.46***	.46***	.46***
2-Way Interactions					
	Inhibitory Control x Depressed-Affect Dysregulation	.02	.03	.04	.04
	Inhibitory Control x Cognition	-.19	-.15	-.11	-.21
	Depressed-Affect Dysregulation x Cognition	.21	.04	.10	.18
	$\Delta R^2$	.00	.00	.00	.01
3-Way Interaction					
	Inhibitory Control x Depressed-Affect Dysregulation x Cognition	-.50	-.50*	-.52**	-.33*
	$\Delta R^2$	.00	.01*	.01**	.01*

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Simple slope analyses were conducted using Hayes' (2013) PROCESS module to evaluate the links between cognitions and aggression at different combinations of inhibitory control and depressed-affect dysregulation. Figure 7 displays findings that the association between revenge goals in ambiguous situations and aggression are only positively significantly associated under conditions of high depressed-affect dysregulation and low inhibitory control ( $\beta = .47, p = .025$ ). Consistent with our expectations, under conditions of high levels of inhibitory control and high levels of depressed-affect dysregulation, revenge goals in ambiguous situations and aggression are unrelated ( $\beta = -.16, p = .613$ ) and yield the lowest levels of aggression (see bottom panel, lowest line in Figure 7).

**Figure 7**

*Three-Way Interaction Between Inhibitory Control, Other-Reported Depressed-Affect Dysregulation, and Revenge Goals in Ambiguous Situations on Other-Reported Aggression*

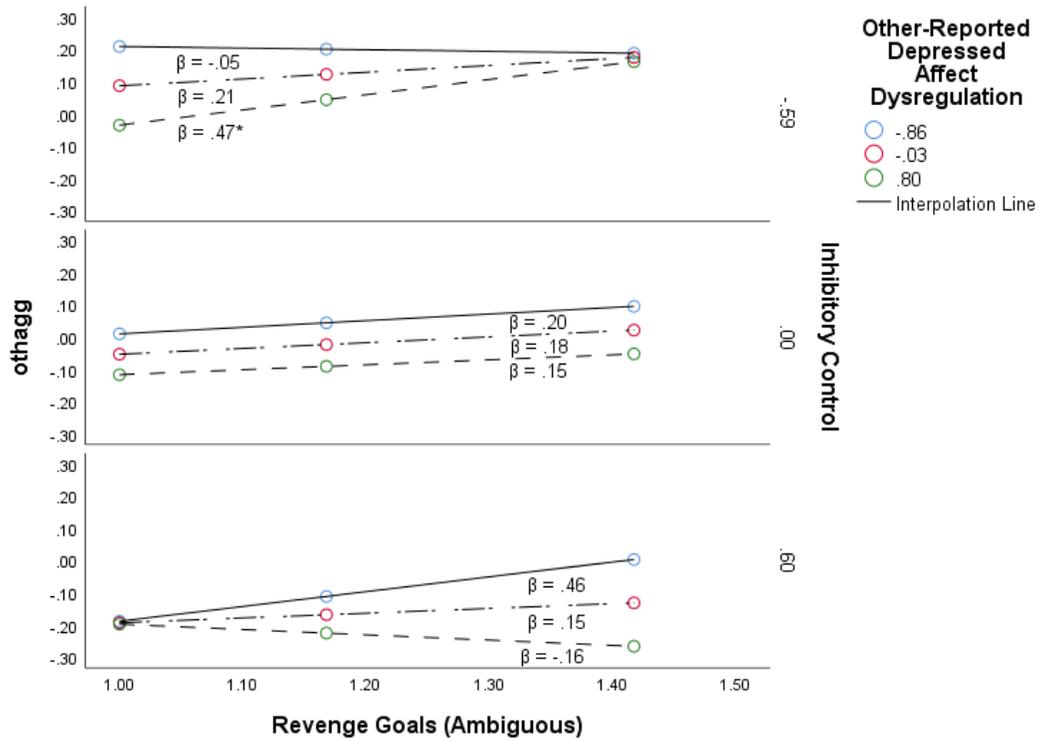


Figure 8 shows the same association between revenge goals in unambiguous situations and aggression, but that association is only marginally significant ( $\beta = .26$ ,  $p = .061$ ). Additionally, it displays that the lowest levels of aggression exist under conditions of high levels of inhibitory control and high levels of depressed-affect dysregulation (see bottom panel, lowest line in Figure 8) and the cognition-behavior association is suppressed ( $\beta = -.19$ ,  $p = .380$ ).

**Figure 8**

*Three-Way Interaction Between Inhibitory Control, Other-Reported Depressed-Affect Dysregulation, and Revenge Goals in Unambiguous Situations on Other-Reported Aggression*

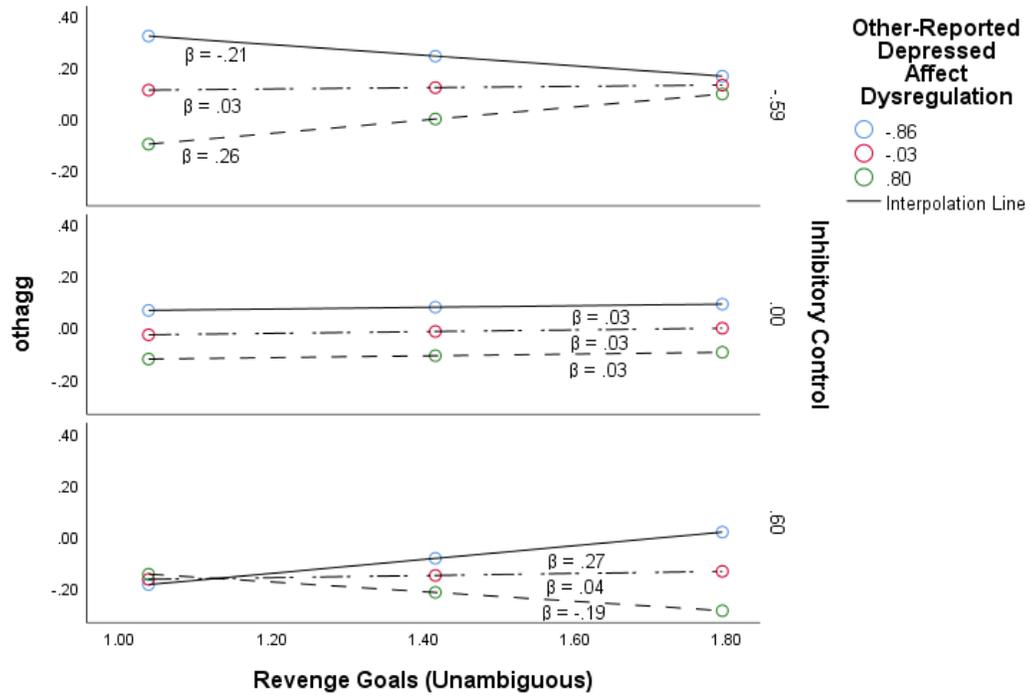
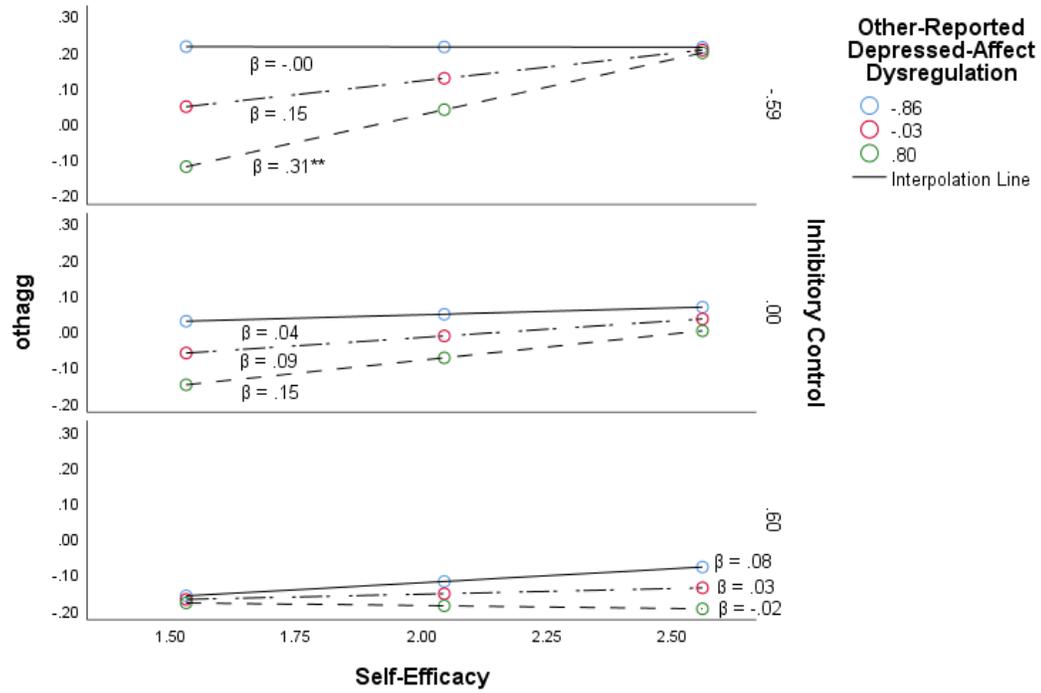


Figure 9 indicates that only those who are high in depressed-affect dysregulation and low in inhibitory control are likely to act on their self-efficacy for aggression ( $\beta = .31, p = .002$ ). Again, it was those who exhibited high levels of inhibitory control and high levels of depressed-affect dysregulation that behaved the least aggressively (see bottom panel, bottom line in Figure 9) and where the cognition-behavior association was eliminated ( $\beta = -.02, p = .911$ ).

**Figure 9**

*Three-Way Interaction Between Inhibitory Control, Other-Reported Depressed-Affect Dysregulation, and Self Efficacy to Aggress on Other-Reported Aggression*



These findings are all consistent with our hypotheses, as we predicted that high levels of depressed-affect dysregulation would inhibit children from acting upon their aggressogenic thought when they had high levels of inhibitory control.

## Chapter VI

### DISCUSSION

In this study, we evaluated the associations between three cognitions – self-efficacy, hostile attributions, and revenge goals in both ambiguous and unambiguous situations – and aggression, while also assessing whether anger dysregulation, depressed-affect dysregulation, and inhibitory control further qualify these associations. Our correlational findings were largely consistent with previous literature. As Runions and Keating (2010) concluded, those who exhibited lower levels of inhibitory control were most likely to aggress ( $-.50, p < .001$ ). Roos et al. (2016) also found lower levels of inhibitory control as contributory factors to aggression, as well as the presence of anger. Both self-reported anger dysregulation and other-reported anger dysregulation were significantly related to aggression, revealing that – regardless of the source of information – the more difficulty one has regulating their anger, the more aggressive they are likely to be ( $.15, p < .01$ ;  $.67, p < .001$ ). Other-reported depressed-affect dysregulation was also associated with aggression, but not in the direction that we predicted. These results show that those who have a difficult time regulating their depressed affect are more likely to aggress. Two out of the three cognitions (revenge goals in ambiguous situations, revenge goals in unambiguous situations, self-efficacy) were also significantly and positively associated with aggression, as revenge goals in both ambiguous and unambiguous situations ( $.15, p < .01$ ;  $.12, p < .05$ ), as well as self-efficacy to aggress ( $.14, p < .05$ ) all increased the likelihood of aggression. It is important to note, however, that these correlations were weak, suggesting there are other factors that qualify these

associations, in agreement with prior research (Roos et al., 2016; Runions & Keating, 2010).

We tested Read et al.'s (2010) theory that interactions between motivational systems and inhibitory control influence the expression of behaviors, along with Keltner et al.'s (2003) assertion that emotional states may also qualify these cognition-behavior associations. Runions and Keating (2010) and Roos et al. (2016) were the first known to provide support for Read et al.'s (2010) and Keltner et al.'s (2003) theory, as they found that aggressogenic cognitions are either expressed or inhibited depending on the levels of emotion dysregulation and inhibitory control. In all sixteen of our hierarchical multiple regression analyses, the main effect of inhibitory control was significantly associated with less aggression. Moreover, this association held even after statistically controlling for emotion dysregulation (from either source) or each aggressogenic cognition. More importantly, inhibitory control interacted with anger dysregulation and children's self-efficacy to aggress when predicting aggression in ways consistent with our formulation derived from Keltner et al. (2003) and Read et al. (2010), while at the same time replicating Roos et al. (2016), who also found that inhibitory control moderates the relationship between anger, aggressogenic cognitions, and aggressive behaviors. In particular, the connection between children's self-efficacy to aggress and aggression was strongest for children with high levels of anger-dysregulation and low levels of inhibitory control.

Although the other cognitions were also qualified by inhibitory control and (other-reported) anger dysregulation, the strongest cognition-behavior associations existed at surprising levels of these moderators. That is, cognition-behavior associations

were strongest when inhibitory control was high and anger dysregulation was low. Perhaps these disparate findings arise due to variations in the trait-like characteristics of the cognitions studied here. For example, Peets, Kikas, Hodges, and Salmivalli (2007) and Peets, Hodges, and Salmivalli (2008) found that self-efficacy shows consistency across relationship partners (e.g. a friend vs. neutral vs. an enemy), whereas hostile attributions of intent are almost entirely dependent on with whom one is interacting. That is, self-efficacy appears to be more trait-like in that it is more consistent across contexts whereas attributions of hostile intent appear to be almost entirely situation-specific. Perhaps this may help to understand why only the interaction involving self-efficacy was fully consistent with Read et al.'s (2010) formulation.

However, both Runions and Keating (2010) and Roos et al. (2016) found an interaction between hostile attributions of intent, anger, and effortful control when predicting aggression in a manner consistent with Keltner et al. (2003) and Read et al. (2010). Thus, it is not clear that differences in the trait-like characteristic of the cognition under study accounts for why some of our cognitions interacted with anger and inhibitory control in unexpected ways. This unexpected pattern was repeated in our study for revenge goals in both ambiguous and unambiguous situations, as we hypothesized that for all three of these cognitions, the relationship between the cognition and behavior would be strongest under conditions of high levels of anger dysregulation and low levels of inhibitory control.

Although we did not find that the cognition-behavior associations were strongest under conditions of high anger dysregulation and low inhibitory control (except for self-efficacy), it is important to note that the overall levels of aggression were still highest

under these conditions. The levels of our variables where we believed the relationship between the cognitions and behavior would be the most prominent were not found, but as predicted, those with high anger dysregulation who lacked inhibitory control were the most aggressive group assessed. Additionally, we expected aggression to depend on the degree of hostile attributions of intent, but surprisingly, it did not matter if they did or did not attribute hostile intent, evidenced by the almost insignificant slope. Instead, the degree of hostile attributions of intent did matter at low levels of anger dysregulation and high levels of inhibitory control, however, the association is still the strongest for those who are the least aggressive.

Read et al. (2010) postulated that avoidance-related emotions (i.e. depression) would inhibit the expression of aggressogenic thought, particularly when inhibitory control was high. Three of the four indexes of cognition significantly interacted with depressed-affect dysregulation and inhibitory control. Consistent with our hypothesis, each cognition was unrelated to aggressive behavior when children had difficulty regulating their depressed-affect dysregulation and exhibited high levels of inhibitory control. Moreover, the levels of aggression were lowest at these combinations. Surprisingly, however, the cognition-behavior associations were maximized when children also had difficulties regulating their depressed affect but had low levels of inhibitory control—aggression was also maximized at these combinations.

Analyses revealed that none of the 3-way interactions were significant for those that included self-reported emotion dysregulation, a stark difference in the pattern of results found in the analyses in which emotion dysregulation was assessed by others. This may mean that a child's experience or self-evaluation can be very different from the

judgement of others observing the child. Indeed, it is not always easy to observe how a child is regulating an emotion, while it is much easier to identify how the emotion is manifested in the behaviors they exhibit. For example, excessive crying may be identified as an indicator of depressed-affect dysregulation, while yelling at a peer may be an indication of anger dysregulation. What this may support is that emotion dysregulation in the absence of an associated behavior may be a lot more difficult to predict, however, when children are assessing their own emotional control, they may report feeling angry but not outwardly show it to others. This indicates that one is much more capable of assessing dysregulation from the expression of that dysregulation, and it is the expression that qualifies these cognitive-behavioral associations. A potential direction for future research should focus on one's ability to regulate their expression of an emotion, rather than regulation of the emotion itself. In other words, a child may feel distress internally, but what may be more important is if they are able to regulate it externally.

Some strengths and limitations of this study are noteworthy. Our study of adolescents extended the limited prior research that evaluated the moderating effects of emotion dysregulation and inhibitory control on the relationship between aggressogenic thought and behavior. Of the two prior studies evaluating these relationships, our findings aligned strongest with those of Roos et al. (2016), while being inconsistent with Runions and Keating's (2010) research. Both studies found significant three-way interactions between aggressive cognitions, the approach system (anger), and the inhibitory control system, but Runions and Keating (2010) found that hostile attributions of intent were most strongly related to aggression when anger was high and inhibitory control was low, as opposed to our opposite findings. It is noteworthy, however, that Runions and

Keating's (2010) study evaluated these relationships on much younger children (age 6), and without longitudinal data, it is uncertain if and how the connections would have altered with time and maturation of the participants. Further, our effects were produced by the utilization of teacher reports of anger, depression, aggression, and inhibitory control, using a measure which had not been previously evaluated.

Additionally, the current work is limited to one behavioral domain (i.e., aggression). It is imperative that future work also evaluate whether anger dysregulation enhances, and depressed affect inhibits, the likelihood that children will act on prosocial cognition. For example, children with high self-efficacy for defending peers against bullying may be more likely to engage in these behaviors when they become angry in response to perceived social injustice, a possibility touched upon by both Keltner et al. (2003) and Read et al. (2010). The degree to which low inhibitory control further qualifies such effects will also need to be evaluated.

Another limitation is that cognition and behavior were assessed at a general level, however, it is increasingly recognized that social information processing mechanisms and behavior are highly relationship specific [Peets et al. (2007), Peets et al, (2008)]. Future work should assess the interaction between these cognitions and motivational systems at a target-specific level. For example, a child's attributions of hostile intent may be influenced by their relationship with the offender (e.g. a friend, neutral, or an enemy), which may increase or decrease their likelihood to retaliate. Thus, future work will need to assess, for example, whether children's attributions of hostile intent towards enemies is more likely to be actualized into aggression toward their enemy when they are experiencing elevated anger and have low inhibitory control. Such target-specific

assessments of cognition, emotion, and behavior will also need to be assessed in other relationships (e.g., towards a friend) to ensure the generality of this highly conditional process model. Of course, future work should also utilize longitudinal methods to gain a better understanding of the direction of effects among the study variables.

Our most valuable finding through this research was that children with high levels of anger dysregulation and low levels of inhibitory control are most likely to act on their self-efficacious thoughts of aggression. This replicates the findings of previous research and provides further support that these students are the ones most in need of intervention, to work towards the prevention of aggression in schools. Although we found many outcomes that did not support prior research or our hypotheses, these findings are crucial for future studies to provide clarification for identification of students who are at-risk for exhibiting aggressive behaviors. Regardless, our predictions were correct in that those who were high in anger dysregulation and lacked inhibitory control were the most aggressive, while those who were high in depressed-affect dysregulation and low in inhibitory control were the least aggressive. This reveals an important interaction between emotion dysregulation and inhibition that future research can attempt to replicate. Our results contribute to limited existing research highlighting the levels of moderation on aggressive cognitions and the likelihood to aggress. Establishing how these cognitions function in the context of emotion dysregulation and inhibitory control is crucial to those who are responsible for the well-being of children. Understanding the driving forces of aggressive behavior influences the ability to develop research-based interventions to decrease the expression of aggressogenic thought.

## Chapter VII

### **IMPLICATIONS FOR THE PROFESSION OF SCHOOL PSYCHOLOGY**

The results of this study have the potential to benefit the field of School Psychology. Our research further supported the notion that the connection between self-efficacy and aggression is dependent on anger dysregulation and inhibitory control. These results could support recommendations for school psychologists to target aggression in their schools. Using the methods outlined from the previous and present research, school psychologists have the potential to identify students who exhibit high levels of anger dysregulation and low levels of inhibitory control, who also report significant self-efficacy to aggress. We can postulate that these students may be the most at risk for aggressive behaviors which, as emphasized, could lead to a host of negative consequences, additional externalizing behaviors, and a future of aggression. These students may be the ones that would benefit most from targeted psychoeducation and interventions. As an identifiable potential trial group, these students could take part in an intervention that teaches emotion regulation and impulse control strategies, so that even if the child believes that he or she is capable of performing an aggressive act, these techniques can work to increase their emotional and inhibitory control, and decrease their probability of aggression.

This research can also assist school psychologists in their efforts to reduce aggression school-wide. Most building-level strategies to target bullying and aggression promote a “zero tolerance” policy, which does not teach students how to regulate themselves to prevent aggressive behaviors from occurring. Building-level interventions can instead focus on the cognitions that underlie aggressive behaviors (e.g. educating

students on what a hostile attribution bias is) and explore how these cognitions impact their levels of anger in given situations. Receiving insight from students regarding how they process and apply these cognitions would be valuable in developing additional targeted techniques to combat aggression. It may also be possible to execute school-wide practices for students to self-evaluate different levels of emotion dysregulation that they may be experiencing. For example, creating and displaying easy-to-read posters that identify a continuum of emotion or self-control may help students put into words how they are feeling during a moment of distress. As students practice identifying their emotional states, schools can provide students with a variety of emotion-regulation strategies and tips on how to regain control (i.e., grounding techniques). The ability for students to identify their degree of distress, as well as the opportunity to practice strategies to enhance the skills that regulate their anger and inhibitory control could significantly decrease incidents of aggressive behaviors and punitive measures, with the potential to change the climate of a school as a whole.

Our results brought us a better understanding of the relationship between inhibitory control, emotion regulation, aggressogenic cognitions, and aggressive behaviors. We hope to disseminate these findings to the unfathomable amount of people who are invested in the well-being of children and adolescents, whether it be parents, teachers, administrations, or the various boards and departments of education across the country. With this additional support of the variables that influence the expression of aggressive behavior in children and adolescents, future research may continue to develop targeted interventions and inform curriculum for educational professionals to combat aggression within their schools.

Appendix A  
Letter to Parents

Dear Parent or Guardian,

My name is Jessica Held, and I am from St. John's School Psychology Doctoral Program. As part of our continuing interest in children's social development and in ensuring a successful experience in middle school, I am conducting a research project and wish to invite your 5<sup>th</sup> or 6<sup>th</sup> grader to participate. This project will help us learn how to better assist children when they are experiencing difficulties in responding to social situations affectively and appropriately. It is hoped that the information gained from the study will help to inform school interventions, conflict resolution programs, and other programming that will improve children's social experiences in school.

Your child will be filling out questionnaires during one class session. These questionnaires will ask students about their own thoughts and feelings as well as the thoughts, feelings, and behaviors of their peers at school. For example, students will be asked questions about how they would think and respond to hypothetical scenarios with their peers, observations of their peers within the classroom setting, and their attitudes and beliefs regarding their own abilities to manage stressful social situations. The questionnaires will take about 48 minutes to complete in each session.

In the past, students have enjoyed participating in this type of research. All participating students will be given a small token of appreciation in order to thank them for their help. Students who do not participate in the research will temporarily move to another room and will be asked to work on something else while the other students are filling out the questionnaires. Your child's standing at school will not be affected, regardless of whether he/she participates in this research.

Your child's answers will be kept private. All the information that your child provides will be kept with the strictest confidentiality. The researchers will use a number to identify your child's answers to the questionnaires. Only the researchers will have access to the completed questionnaires, and they will never share any other information that could be used to identify your child.

If you do not wish for your child to participate in this research, please fill out the attached form and mail it back to Mineola Middle School by May 8, 2019. In addition, if you have any questions or concerns, please feel free to email me ([Jessica.Held15@stjohns.edu](mailto:Jessica.Held15@stjohns.edu)) or Dr. Ernest Hodges ([Hodgese@stjohns.edu](mailto:Hodgese@stjohns.edu)) by May 8, 2019. We will be glad to address any issues about our research. We anticipate that the project will begin on or after this date. If you have any questions about your child's rights as a research participant, please contact the chair of the St. John's University Institutional Review Board, Dr. Raymond DiGiuseppe ([digiuser@stjohns.edu](mailto:digiuser@stjohns.edu)) or the IRB Coordinator, Dr. Marie Nitopi ([nitopim@stjohns.edu](mailto:nitopim@stjohns.edu)).

Sincerely,

Jessica Held, M.S.

## Appendix B

### Child Assent Statement (The following is to be read to the child)

We are asking you to answer some questions regarding some thoughts, feelings, and behaviors. This project is interested with how different thoughts and feelings can influence different types of behaviors. All the testing will take the form of questionnaires that will be given to you over one to two days during your English and Math classes. You will be asked questions about yourself and your classmates, as well as some questions about your own thoughts and feelings. Children usually find these kinds of questions interesting and enjoy responding.

Your answers will be completely confidential. For example, your friends, parents or teachers will not have access to your answers. To make sure that nobody knows your answers, you will be given an ID number and you will not put your name on any of the questionnaires. In addition, at any time, you are free to leave any questions blank or to stop participating at any time.

## Appendix C

### Vignettes for Ambiguous Situations

A. Imagine that you are sitting at the lunch table at school eating lunch. You look up and see another kid coming over to your table with a carton of milk. You turn around to eat your lunch, and the next thing that happens is that the kid spills milk all over your back. The milk gets your shirt all wet.

1. Rate how likely is it that the kid did this by accident
  - Definitely by accident
  - Maybe by accident
  - Maybe on purpose
  - Definitely on purpose
2. Rate how likely do you think this kid was trying to be nice versus be mean
  - Definitely mean
  - Maybe mean
  - Maybe nice
  - Definitely nice
3. How would you deal with (or handle) this situation if it happened to you? [choose one]
  - I'd leave the lunchroom.
  - Pour milk on the kid's back the next day.

B. Imagine that some kids are playing a game, hanging out together, or making something. They're having fun and you'd like to join them. You walk up and ask if you can join in. Nobody answers you.

1. Rate how likely is it that the kid did this by accident
  - Definitely by accident
  - Maybe by accident
  - Maybe on purpose
  - Definitely on purpose
2. Rate how likely do you think this kid was trying to be nice versus be mean
  - Definitely mean
  - Maybe mean
  - Maybe nice
  - Definitely nice
3. How would you deal with (or handle) this situation if it happened to you? [choose one]
  - I'd try to wreck their game somehow.
  - I'd stay away from those kids for the rest of the day.

C. Imagine that you are walking to school and you're wearing your new running shoes. You really like your new shoes, and this is the first day you've worn them. Suddenly you're bumped from behind by another kid. You stumble and fall into a mud puddle and your new shoes get muddy.

1. Rate how likely is it that the kid did this by accident
  - Definitely by accident
  - Maybe by accident
  - Maybe on purpose
  - Definitely on purpose
2. Rate how likely do you think this kid was trying to be nice versus be mean
  - Definitely mean
  - Maybe mean
  - Maybe nice
  - Definitely nice
3. How would you deal with (or handle) this situation if it happened to you? [choose one]
  - Push the kid in the mud.
  - Run away.

D. Imagine that you go to the playground where some other classmates are playing an exciting game. You would like to take part in the game. You go over and ask, "Can I join the game as well?" One of your classmates says, "No!" At the same time, you see other kids laughing.

1. Rate how likely is it that the kid did this by accident
  - Definitely by accident
  - Maybe by accident
  - Maybe on purpose
  - Definitely on purpose
2. Rate how likely do you think this kid was trying to be nice versus be mean
  - Definitely mean
  - Maybe mean
  - Maybe nice
  - Definitely nice
3. How would you deal with (or handle) this situation if it happened to you? [choose one]
  - Mess up the game.
  - Keep away from this classmate in the future.

## Appendix D

### Vignettes for Unambiguous Situations

Directions: This questionnaire describes different situations that could occur in your everyday life at school. Try to imagine that you are actually in these situations. After reading each story you will be asked to indicate your responses to each situation.

#### The Party

A kid in your class is having a party for their birthday. The kid has invited a lot of people from your class. When you ask if you are invited to the party, the kid says “No. Only cool kids are invited to my party.”

1. Rate how likely this kid meant to hurt you:
  - Definitely did not mean to hurt me
  - Maybe did not mean to hurt me
  - Maybe meant to hurt me
  - Definitely meant to hurt me
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

#### Board Games

One day in class the teacher says you can have free time to play games. The kids in your class go over to grab the board games. You see some kids setting up the game you want to play. You go over to them and ask if you can play with them. One of the kids says no and laughs at you.

1. Rate how likely this kid meant to hurt you:
  - Definitely meant to hurt me
  - Maybe meant to hurt me
  - Maybe did not mean to hurt me
  - Definitely did not mean to hurt me
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

### Group Work

You have a science project to do with two other people from your class. The teacher randomly assigned groups but you have worked with both of the other students before and you thought you got along well with them. While discussing the assignment, you attempt to give some input and share your ideas. However, one of your classmates does not listen to your ideas at all. When you share your ideas, the kid just talks about a different idea. After trying to tell them about your last idea, which you thought was really good, the kid says, “That’s a bad idea.”

1. Rate how likely this kid meant to hurt you:
  - Definitely did not mean to hurt me
  - Maybe did not mean to hurt me
  - Maybe meant to hurt me
  - Definitely meant to hurt me
  
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

### The Play

You are auditioning for a play and you are really excited and really nervous. At the auditions, the director tells everyone that they need to pair up with a partner to read lines. You ask one of your classmates to pair up with you. The classmate says no and adds, “You aren’t very good at this.”

1. Rate how likely this kid meant to hurt you:
  - Definitely meant to hurt me
  - Maybe meant to hurt me
  - Maybe did not mean to hurt me
  - Definitely did not mean to hurt me
  
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

### Picking Teams

There are two students that you know who are picking teams to play a game. This is a game you think you are really good at and you think that you can do really well for your team. There are an uneven number of people who want to play so it looks like someone will be left out. As people are being chosen, you realize that a lot of other players are being picked before you. Finally, there are only two players left: you and another kid.

The other kid gets picked and you are left out and cannot play. One of the kids says, "I am glad you aren't on my team."

1. Rate how likely this kid meant to hurt you:
  - Definitely did not mean to hurt me
  - Maybe did not mean to hurt me
  - Maybe meant to hurt me
  - Definitely meant to hurt me
  
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

### Practice Time

You are trying out for a sports team and the coach chooses groups of players to practice together as a team before try-outs. One of the players is designated captain of your team by the coach. The captain assigns positions, but because there are extra people, one person will have to sit out while the others play. The captain keeps assigning you to sit out and you can't figure out why. You ask to play but the team captain ignores you. Eventually, the team captain says, "You can't play because you are a bad player."

1. Rate how likely this kid meant to hurt you:
  - Definitely meant to hurt me
  - Maybe meant to hurt me
  - Maybe did not mean to hurt me
  - Definitely did not mean to hurt me
  
2. What would your goal be in the situation (choose one)
  - I would try to get back at that person
  - I would be trying to hurt the person like they hurt me
  - I would try to avoid getting hurt more

## Appendix E

### Self-Efficacy

Please rate how well you agree to the following statements, using the following scale:

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

Please keep in mind that all of your responses will be kept private.

1. Fighting is hard
2. Fighting is easy
3. If on the playground, a kid bumped into me, it would be easy for me to call the kid nasty names
4. A kid won't let me play with a game I want to. Pushing the kid and grabbing the game would be hard for me
5. A kid gets in my way while trying to get on the bus. It would be easy for me to shove the kid out of the way
6. It is hard for me to tease other kids and call them nasty names
7. If I am racing with a kid to get to the water fountain, it would be easy for me to trip the kid so I can get to the water fountain first
8. If a kid makes me mad, it would be easy for me to yell at the kid
9. I am good at hurting others
10. I am bad at hurting others

## Appendix F

### Peer Report

Please choose how much each of the following statements apply to your classmates, using the following scale:

0	1	2
Not at All	Some	A Lot

Keep in mind that all of your responses will be kept private.

Here is a practice example:

He/she is good at art

Now complete the items below:

1. He/she gets angry easily
2. He/she has a hard time calming down when angry
3. He/she has an easy time calming down when angry
4. He/she gets sad easily
5. He/she has a hard time cheering up when sad
6. He/she has an easy time cheering up when sad
7. He/she hits and pushes others around
8. He/she makes fun of people
9. When he/she is mad at a person, he/she ignores them or stops talking to them
10. He/she is just plain mean

## Appendix G

### Teacher Report

Please rate this student based on your observations and impressions of the student throughout the school year, using the following scale:

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

Keep in mind that all of your responses will be kept private.

Here is a practice example:

He/she is good at art

Now complete the items below:

1. He/she gets angry easily
2. He/she has a hard time calming down when angry
3. He/she has an easy time calming down when angry
4. He/she gets sad easily
5. He/she has a hard time cheering up when sad
6. He/she has an easy time cheering up when sad
7. He/she hits and pushes others around
8. He/she makes fun of people
9. When he/she is mad at a person, he/she ignores them or stops talking to them
10. He/she is just plain mean
11. He/she has a hard time waiting his/her turn to speak when excited
12. He/she opens presents before he/she is supposed to
13. He/she is more likely to do something he/she shouldn't do the more he/she tries to stop himself
14. He/she is able to stop him/herself from laughing at inappropriate times
15. He/she is usually able to stick with his/her plans and goals

## Appendix H

### Self-Report of Emotion Dysregulation

Please choose how much each of the following statements apply to yourself, using the following scale:

0	1	2
Not at All	Some	A Lot

Keep in mind that all of your responses will be kept private.

Here is a practice example:

I am good at art

Now complete the items below:

1. I get angry easily
2. I have a hard time calming down when angry
3. I have an easy time calming down when angry
4. I get sad easily
5. I have a hard time cheering up when sad
6. I have an easy time cheering up when sad

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