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Social cognition, impulsivity, and emotion regulation factors in aggressive behavior among children with attention-deficit/ hyperactivity disorder.

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SOCIAL COGNITION, IMPULSIVITY, AND EMOTION REGULATION FACTORS IN AGGRESSIVE BEHAVIOR AMONG CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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ABSTRACT

SOCIAL COGNITION, IMPULSIVITY, AND EMOTION REGULATION FACTORS IN AGGRESSIVE BEHAVIOR AMONG CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Children with Attention-Deficit/Hyperactivity Disorder (ADHD) exhibit greater levels of aggressive behavior than their typically developing peers, often resulting in impairment in social and family functioning. Aggressive behavior is often differentiated into two functions: reactive, or "hot-blooded" and proactive, or "cold-blooded" aggression. Prior research has identified several factors contributing to aggressive behavior within a general population, including emotion dysregulation, negative urgency, social information processing (SIP), and parenting behaviors. A paucity of research has examined these factors within an ADHD population. Thus, the present study aimed to examine social, emotional, behavioral, and cognitive factors associated with aggression among children with ADHD. Specifically, the present study investigated the independent and combined roles of emotion dysregulation and negative urgency in reactive aggression as well as the independent and interactive roles of SIP and parenting behaviors in proactive aggression. Participants included 28 children with ADHD and their parents. Participants, their parents, and their teachers completed questionnaires to assess emotion dysregulation, negative urgency, aggressive behavior, and parenting behaviors. Parents completed a diagnostic interview to confirm ADHD diagnostic status. Children

completed one task to assess aggression and responded to social vignettes to assess social information processing. Of note, the data collection was prematurely discontinued due to the emergence of the COVID-19 pandemic; therefore, results of the present study should be interpreted with caution due to low power. Hypothesis 1 was partially supported, such that emotion dysregulation significantly estimated reactive aggression regardless of reporter. Further, negative urgency significantly estimated reactive aggression when reported by parents, but not by teachers. Contrary to hypothesis 2, SIP did not significantly estimate proactive aggression, and no interaction between SIP and parenting behaviors was observed. However, inconsistent discipline did significantly estimate proactive aggression suggesting learning history and environment play an important role in proactive aggression. Finally, contrary to hypothesis 3, no indirect effect of emotion dysregulation on reactive aggression through negative urgency were observed; however, these results are inconclusive due to low power. Findings of the present results have significant implications for the way in which aggression is conceptualized, as well as clinical implications for the treatment of aggressive behavior among children with ADHD.

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CHAPTER I

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder affecting approximately 5% of children in the United States (APA, 2013). Children with ADHD not only exhibit difficulties with the cardinal symptoms of inattention, hyperactivity, and impulsivity, but exhibit deficits with emotion regulation (Shaw et al., 2014), behavioral dysregulation (APA, 2013), social cognition (Bora & Pantelis, 2016), and peer relationships (Wiener & Mak, 2009). However, one difficulty that commonly results in referrals for child mental health services is the presence of aggressive behavior (Steiner et al. 2003; Connor et al. 2006). Indeed, over 50% of children with ADHD exhibit significant and impairing aggression at one point in time (Saylor & Amann, 2016; Jensen et al., 2007). Such difficulties with aggression predispose children to further impairment in social, emotional, and global functioning (Poulin & Boivin, 2000). Further, aggressive behavior in the U.S. costs an average of $70 billion per year to society (Corso et al., 2007). Despite such significant difficulties, there is no known consensus in the literature as to why children with ADHD engage in aggressive behavior. Thus, given the vast societal and personal implications, empirical study of this topic is critical and timely. Therefore, the current study aims to assess factors associated with aggression among children with ADHD.

Aggressive Behavior

While uniform on its face, aggressive behavior and its development is a highly heterogeneous construct. f and proactive, defined below. This method of distinguishing between the forms of aggression is clinically useful, as reactive and proactive functions of aggression differentially predict treatment outcomes (Connor et al., 2002) and psychosocial functioning (Dodge et al., 1997; Little et al. 2003). Of note, reactive and proactive aggression are highly correlated, with studies reporting correlations coefficients ranging from r =.4 to r = .9, (Card & Little, 2006; Polman et al., 2007). Several explanations as to their co-occurrence exist, with the predominant arguments suggesting it is an artifact of their measurement or an artifact due to their shared phenotype (Card & Little, 2006). That is, both reactive and proactive aggression appeared similar in their overt presentation (e.g., hitting, kicking, throwing), despite different underlying causes. Finally, some evidence suggests that the high rates of correlation may be due to the high rates of co-occurrence, such that children who exhibit one form of aggression are likely to exhibit the other as well, although not to the same degree (Card et al., 2006). Despite high rates of co-occurrence and correlation, research utilizing meta-analytic methods indicate that the two are clearly distinct, as they are associated with different functional outcomes (Polman et al., 2007) The differentiation of the reactive and proactive functions of aggression are central to the proposed study in that the study aims to further elucidate the underlying factors associated with aggressive behavior among children with ADHD.

Proactive aggression is most notably described as callous, planned, and "cold-blooded," in that the actions are utilized as a means for achieving one's goals (Dodge et al., 1997). One example of proactive aggression may include a child pushing another to

take a toy or get ahead in line. Children that exhibit proactive aggression often value instrumental goals over relational goals, positively evaluate the aggressive behaviors, and expect positive outcomes to such aggressive behavior (Crick & Dodge, 1996). Reactive aggression, on the other hand, is often characterized as "hot-blooded" action that occurs in reaction to internal frustration, external provocation, or perceived threats (Waschbusch et al., 1998). One example of reactive aggression can include a child who throws a ball at a peer due to frustration in response to being teased. Reactively aggressive individuals may be described as "short-fused" due to the unpredictability with which the bursts of aggression occur (McAdams, 2002). Reactive aggression is based on the frustration-aggression hypothesis, which states that aggression occurs primarily as a result of negative affect (Berkowitz, 1963). While little data exist on the prevalence of reactive or proactive aggression or the number of children that exhibit each type of aggression, evidence suggests that reactive aggression occurs more often than proactive aggression. Specifically, McAdams (2002) estimated that 13.5% of aggressive acts are proactive and 72% of aggressive behaviors are reactive.

Developmentally, reactive and proactive aggression have similar, yet distinct, trajectories. Both reactive and proactive aggression are observed in young children; indeed, research suggests that aggression is developmentally normative throughout young childhood and is often childhood-limited (Hay, 2005; Tremblay & Nagin, 2005). While the development of reactive aggression precedes proactive aggression (Vitaro & Brendgen, 2005), the two appear to be similar in that both appear to peak around the sixth grade. At that time, the rate at which most individuals engage in the behavior begins to gradually decrease, although it remains stable from that time point on in a subset of

children (Fite et al., 2008). For proactive aggression, it is believed that an even smaller subset engages in greater rates of aggression during adolescence, but that acts of aggression become more covert and advanced in their approach (Bennett et al., 2004; Vitaro et al., 2006). The stability of aggression among some individuals appears to be hereditary, with 48% of the stability in reactive aggression and 85% of the stability in proactive aggression being attributable to genetic factors (Tuvblad et al., 2009; Tuvblad & Beaver, 2013).

Developmentally, reactive aggression often precedes proactive aggression. Indeed, reactive aggression predicts the development of future proactive aggression (Vitaro & Brendgen, 2005). Some parts of the literature hypothesize that individuals increasingly engage in proactive aggression through accidental reinforcement of aggressive acts, social influences, and parental modeling (McCauliffe et al., 2007). That is, upon observing the potential benefits from aggressive behavior either directly or indirectly, some individuals are likely to utilize aggression as a tool to obtain those benefits in the future. Thus, while children often initially engage primarily in reactive aggression at a young age, they may begin engaging in proactive aggressive acts after experiencing or observing rewards associated with the behavior.

Aggression in ADHD

Children with ADHD often experience difficulties with behavioral problems. Indeed, according to Gaub and Carlson (1997), when compared to their peers, children with ADHD exhibit greater difficulties with Child Behavior Checklist (CBCL)-rated externalizing problems, aggressive behavior, and delinquent behavior than their peers without ADHD. This appears to differ among children with ADHD as well, as children

with hyperactive/impulsive and combined presentations exhibit greater difficulties according to these indices than those with the inattentive presentation (Gaub & Carlson, 1997). In terms of aggressive behavior specifically, approximately 50% of children with ADHD exhibit significant and impairing aggression (Jensen et al., 2007; Saylor & Amann, 2016). Aggression among children with ADHD is a major risk factor for concurrent social difficulties, such as peer rejection (Poulin & Boivin, 2000), and emotional and global functional impairment. In fact, aggressive behavior accounts for approximately 10% of the variance in functional impairment in comparison to only 2% of the variance accounted for by ADHD symptoms (Jensen et al., 2007). Longitudinally, aggression in ADHD is associated with antisocial and criminal behavior in adulthood (McKay & Halperin, 2001).

This pattern of heightened aggressive behavior among children with ADHD extends to reactive and proactive aggression. Children with ADHD engage in more frequent reactive and proactive aggression than those without ADHD. In fact, children with ADHD are twice as likely to engage in proactive aggression than their peers. When factoring in medication, those on medication exhibit significantly less proactive aggression than those taking a placebo treatment, such that children on medication did not differ from children without ADHD (King et al., 2009). Bennett and colleagues (2004) further assessed the relation between ADHD symptoms and reactive and proactive aggression, stratified by age. The authors reported that reactive aggression was significantly positively correlated in all age groups, as well as the overall sample. However, the only correlation significant for proactive aggression was for the oldest group (adolescents) and the total sample, suggesting that the association becomes

stronger with age. Therefore, while research suggests that children with ADHD exhibit more reactive and proactive aggression, the link between reactive aggression and ADHD symptoms appears stronger than that of proactive aggression and ADHD throughout childhood until adolescence

Taken together, the extant literature suggests that children with ADHD exhibit substantially greater deficits with reactive and proactive aggression than their peers which may predispose them to a series of long-term negative consequences. Those behaviors appear to have unique functions despite their co-occurrence. Thus, understanding the specific underlying predispositions to such behavior is critical to guide more appropriate treatment and prevention efforts.

Aggression, Emotion Regulation, and Urgency in ADHD

Theories of Emotion Dysregulation

Emotion dysregulation has evolved as a major area of study in recent history. Such growth in interest may be reflective of emotion dysregulation's transdiagnostic nature (Fernandez et al., 2017). Indeed, research indicates that emotion dysregulation plays a role in anxiety disorders (Cisler et al., 2010), depression (Joorman & Stanton, 2016), eating disorders (Ruscitti et al., 2016), substance use disorders (Dingle et al., 2018), and ADHD (Shaw et al., 2016), as well as difficulties such as experiential avoidance (Sloan, 2004), social dysfunction (Fogleman et al., 2018), and aggressive behavior (Shaw et al., 2014; Shields & Cicchetti, 1998). While not included in the DSM-5 diagnostic criteria, emotion dysregulation is a substantial deficit among children with ADHD, occurring in up to 45% of children with the disorder (Shaw et al., 2014). In fact, current research suggests that many of the impairments and deficits observed in children

with ADHD are mediated by emotion dysregulation (Fogleman et al., 2018; Shaw et al., 2014).

Emotion regulation is a multi-systemic and multi-dimensional process of modulating one's emotional experience in terms of intensity, valence, expression, or duration in order to meet internal or environmental demands (Cole et al., 2004; Gross et al., 2002; Gross & Thompson, 2007). That is, emotion regulation is the process by which emotions are experienced and regulated to best suit the demands of the situation. In terms of its multi-systemic nature, emotion regulation occurs at both physical and psychosocial levels. Dysregulation occurs when one or more of the systems are underdeveloped, impaired, or ineffective. Emotion regulation is believed to be a stable, transdiagnostic construct underlying both internalizing and externalizing problems (McLaughlin et al., 2011; Zeman et al., 2006).

Several theories of emotion regulation exist, as well as well-established lines of research in the physiological (Beauchaine, 2015; Porges et al., 1994; Porges, 2001), neurobiological (Banks et al., 2007), cognitive (Gross, 1998), and social (Shuman, 2013) aspects. One of the predominant theories of emotion regulation is Gross's process model (Gross, 1998), which integrates cognitive and behavioral aspects of emotion regulation into one model. According to the Gross process model, there are five stages of emotion regulation that are subdivided into antecedent-focused and response-focused strategies. Antecedent-focused strategies include situation selection (avoiding situations that evoke emotional responses), situation modification (modifying the situation through their behavior or actions to prevent dysregulated affect expressions), attentional deployment (selecting to attend to non-emotional aspects of the situation), and cognitive change

(reframing or reappraising one's perspective). Response-focused strategies include response modification or modulation, such as changing the expression of emotion or behavior following an emotional experience. Antecedent-focused strategies are often more effective than response-focused, although both are effective to some extent for reducing maladaptive responding (Gross, 1998). Dysregulation occurs when there is a lapse at one or more of these stages.

Emotion Dysregulation and Aggressive Behavior

The importance of emotions in aggressive behavior has become an emerging area of research due to the limitations of behavioral models, which focus on rewards and contingencies associated with aggression. As such, ample research has examined the role of negative affect in the development of aggressive behavior. Indeed, both trait negative affect (Fite et al., 2009; Shamsipour et al., 2018) and state negative affect (Berkowitz, 2012; Novaco, 2011, Marsee et al., 2008) have been identified as triggers for aggressive behavior. That is, aggressive behavior often occurs both among individuals predisposed to negative affect and in instances of high negative affect. Emotion dysregulation is one proposed mechanism by which negative affect results in aggression. Due to irritability (herein defined as reactivity to negative stimuli; Leibenluft & Stoddard, 2013), poor tolerance of negative affect, and heightened affective intensity, some individuals high in emotion dysregulation aim to reduce distress through maladaptive means such as aggression (Agnew, 2001; Shields & Cicchetti, 1998). Indeed, recent work suggests that emotion dysregulation fully mediates the relationship between negative affect and physical aggression, such that negative affect relates to aggressive behavior through its relationship with emotion dysregulation (Donahue et al., 2014). That is, aggressive

behavior in the presence of negative affect occurs as a result of the influences of emotion dysregulation. This suggests that when children experience high negative affect that may be distressing or difficult to tolerate, they either neglect to use the antecedent- or response-focused emotion regulation strategies elucidated by Gross' process model or do so ineffectively. That is, children high in emotion dysregulation either fail to identify to skillfully apply the appropriate skills or use them at the improper time. Thus, due to failure to utilize appropriate skills, children experience growing distress and negative affect, thereby resorting to maladaptive means to downregulate their emotional experience.

The role of negative affect and emotion dysregulation is particularly pertinent to reactive aggression, which incorporates emotion into the definition itself (Raine et al., 2006). Indeed, emotional over-arousal is implicated in reactive, but not proactive, aggression (Hubbard et al., 2002). As such, both negative affect (Fite, Stoppelbein & Greening, 2009) and emotion dysregulation (Skripkauskaite et al., 2015) independently estimate reactive aggression when measured concurrently. In fact, the association between emotion dysregulation and reactive aggression is demonstrated by studies using several methods of assessment. While Skripkauskaite and colleagues (2015) utilized self-report measures of emotion dysregulation, Zhang and Gao (2015) assessed this relationship using physiology markers. Specifically, the authors reported that high respiratory sinus arrhythmia (RSA) reactivity, a cardiac indicator of physiological dysregulation, is significantly related to reactive aggression among individuals with no history of adverse life experiences (Zhang & Gao, 2015). Of note, emotion dysregulation has not been found to predict reactive aggression in a 4-year follow-up (Skripkauskaite et

al., 2015). However, this study assessed reactive aggression in adolescents. Research suggests that reactive aggression is strongest in younger children (Kempes et al., 2005; McCauliffe et al., 2007). Thus, the truncated sample in this study may limit the ability to observe the true longitudinal relationships between emotion dysregulation and reactive aggression

Emotion dysregulation and negative affect not only estimate reactive aggression independently but appear to interact. Specifically, research indicates that emotion dysregulation moderates the relationship between negative affect and reactive aggression among adolescents, such that *only* those *high* in anger and *low* in emotion regulation were reactively aggressive (Calvete & Orue, 2012; Donahue et al., 2014). While the mechanistic role of emotion dysregulation has not been explored, it can be inferred that this relationship would remain consistent with findings from general aggression given the independent relations between negative affect and emotion dysregulation, as well as their relationships with reactive aggression.

While the role of emotion dysregulation in reactive aggression has not been explored among children with ADHD specifically, it is posited that this relationship would remain constant given the high rates of both emotion dysregulation (Shaw et al., 2014) and reactive aggression (King et al., 2009a) in this population. Indeed, this relationship has been studied among other populations that exhibit high rates of emotion dysregulation and aggression, such as children receiving care at an inpatient psychiatric unit for aggression (Stellwagen & Kerig, 2018) and children that have experienced abuse or neglect (Shields & Cicchetti, 1998). When applied, these studies suggest that it is emotion dysregulation in the presence of strong negative affect, not psychopathology on

its own, that accounts for the presence of reactive aggression. Therefore, any population with high emotion dysregulation may exhibit high rates of reactive aggression, including those with ADHD.

Urgency

According to the DSM-5 (APA, 2013), impulsivity is among the diagnostic criteria for ADHD, as well as other internalizing and externalizing disorders (Johnson et al., 2013). However, impulsivity is a highly heterogeneous construct, with subcomponents that differentially relate to various behaviors, personality constructs, and neurobiological processes (Evenden, 1999). Therefore, assessing impulsivity as a dimensional, multi-faceted construct as opposed to a unitary, dichotomous construct increases precision and allows results to be reliably compared and thus improving generalizability in research. The prominent multidimensional model is the UPPS-P model of impulsivity (Cyders et al., 2007; Whiteside & Lynam, 2001). According to the UPPS-P model, there are five facets of impulsivity including positive and negative urgency, lack of premeditation, lack of perseveration, and sensation seeking. Negative urgency is defined as the tendency to act rashly in the presence of strong negative emotions (Cyders et al., 2007; Whiteside & Lynam, 2001). Negative urgency has been identified as a strong predisposing factor for a variety of disorders and maladaptive behavior (Cyders & Smith, 2008; Cyders & Smith, 2012). Research on negative urgency has spanned the lifespan, such that its presence and importance in risky behavior has been validated among adults, adolescents, and children (Zapolski et al., 2010; Zapolski, & Smith, 2013). Such a developmental view is critical, as substantial changes in impulsivity occur during this throughout the lifespan. Indeed, negative urgency generally increases throughout

childhood and early adolescence before plateauing in late adolescence to early adulthood (Littlefield et al., 2016).

Given that impulsivity is a core feature within the diagnostic criteria (APA, 2013), it is unsurprising that negative urgency is present among individuals with ADHD. Indeed, the majority of the available research suggests that both children (Geurten et al., 2018) and adults (Egan et al., 2017; Lopez et al., 2015) with ADHD demonstrate significantly greater levels of negative urgency in comparison to non-ADHD peers. In fact, childhood ADHD diagnostic status significantly predicts negative urgency in adulthood, such that adults who were diagnosed with ADHD as a child report significantly higher urgency than their non-ADHD peers (Pederson et al., 2016). The relationship between ADHD and negative urgency appears to hold when considering ADHD dimensionally through the measurement of symptoms, as the number of ADHD symptoms in pre-adolescents is significantly correlated with self-reported negative urgency (Marmorstein, 2012). Further, when considering the separate presentations of ADHD, individuals with the combined presentation exhibit significantly greater negative urgency than those with the predominantly inattentive presentation (Lopez et al., 2015). This may indicate one of two conclusions. First, this may suggest that negative urgency is associated with the hyperactive/impulsive symptoms but not the inattentive symptoms. Alternatively, when considering the results of both the Marmorstein (2012) study and Lopez and associates' (2015) study, the results may suggest that those with the combined presentation may exhibit greater urgency solely as a function of exhibiting a greater number of ADHD symptoms. Indeed, those with the combined presentation must exhibit a minimum of 12 symptoms as opposed to six for the predominantly inattentive presentation. However,

there is a lack of research to assist in reaching a definitive conclusion.

Biological, emotional, and executive functioning deficits may account for the relationship between ADHD and urgency. Research suggests that individuals high in negative urgency fail to utilize the full range of emotion regulation strategies, instead focusing simply on emotional suppression or inhibition (Blair, 2004; Chester et al., 2016). Given a history of rash action reducing distress in the short term, children high in negative urgency fall back on such rash action when suppression or inhibition fail due to fatigue. In this way, the history of negative reinforcement may serve to perpetuate the tendency to act rashly (Hoptman et al., 2014).

Negative Urgency and Emotion Dysregulation

Impulsivity and emotion dysregulation are closely tied concepts. In fact, impulsivity was previously considered a facet of emotion dysregulation given the importance of inhibition and behavioral control in emotion regulation (Barkley & Fischer, 2010). The two commonly overlap in the estimation of risk-taking behaviors and psychopathology (Cyders & Coskunpinar, 2011). However, other factions of the scientific community separate emotion dysregulation and urgency by citing the unique variance, and thus predictive utility, each contribute to the estimation of risk-taking behavior (Cyders & Coskunpinar, 2011). For instance, the two contribute unique variance to the estimation of drug use and tobacco use (Fox et al., 2007; Dir et al., 2015), problematic alcohol consumption (Cyders & Coskunpinar, 2011), and disordered eating (Pivarunas & Conner, 2015; Racine & Wildes, 2013). For the present study, negative urgency is conceptualized as separate from emotion dysregulation.

To date, only one study has been conducted on the way in which emotion

dysregulation and negative urgency are related to one another. Mitchell and colleagues (2012) assessed this relationship among a small sample of adults with (n = 18) and without (n = 23) ADHD. Not only did individuals with ADHD exhibit greater emotion dysregulation and negative urgency than those without ADHD, but emotion dysregulation fully mediated the relationship between ADHD symptoms and negative urgency. That is, the relationship between ADHD and negative urgency is insignificant when accounting for emotion dysregulation (Mitchell et al., 2012). This suggests ADHD *only* predicts negative urgency due to the high rates of emotion dysregulation present among individuals with the diagnosis.

Mitchell and colleagues' (2012) findings provide some guidance as to the direction of the relationship between emotion dysregulation and negative urgency but fails to answer why or how emotion dysregulation is associated with negative urgency. However, the theoretical basis of the two constructs provides further guidance as to their distinct, but related, nature. First and foremost, it is integral to the core of negative urgency that strong negative affect be present. In accordance with the Gross process model (1998), several errors in the steps of the emotion regulation process leads to increased negative affect and exacerbated distress. For instance, errors during the antecedent-focused strategies (situation selection, situation modification, attentional deployment, and cognitive change) result in children engaging in situations that may be emotionally provoking, attending to emotional aspects of that situation, and failing to modify the situation such that it is less aversive. During this time negative affect and distress build creating optimal conditions for rash actions. Attempts, or lack thereof, to down-regulate during the response-focused strategies may fail to adequately ameliorate

such distress or negative affect. Throughout each of these steps, negative affect systematically increases, thus providing the opportunity for impulsive action to take place in order to downregulate.

This process is particularly pertinent among individuals with ADHD, as emotion dysregulation has been posited as a core deficit among individuals with ADHD alongside hyperactivity and inattention (Barkley, 2010). As such, emotion dysregulation may contribute to the development of other deleterious phenomena or outcomes. While negative urgency occurs at a greater frequency among individuals with ADHD than those without (Egan et al., 2017; Geurten et al., 2018; Lopez et al., 2015; Mitchell et al., 2012), it is not considered core to the disorder. Thus, negative urgency could be considered as one of the negative outcomes of emotion dysregulation among children with ADHD.

Negative Urgency and Reactive Aggression

Negative urgency has been relatively well-studied within the context of aggression and violence. Indeed, a 2015 meta-analysis (Berg et al., 2015) indicated that negative urgency is a significant predictor of aggressive behavior with consistently large effect sizes. This appears to be true for both relational aggression (Burt et al., 2012) and physical aggression (Derefinko et al., 2011) in situations that include threats or instances of high emotionality, such as in intimate partner violence (Derefinko et al., 2011) or bullying (Georgiou & Stravrinides, 2012). Further, urgency estimates aggression in children *above and beyond* the effect of other facets of impulsivity (Miller et al., 2003; Zapolski et al., 2010). In fact, due to the strength of this association, researchers posit that affect-driven impulsivity links together the disruptive behavior and externalizing disorders (Settles et al, 2012).

Not only does it appear that negative urgency predicts aggression, but that it partially mediates the relationship between anger and aggressive behavior (Ammerman et al, 2015). That is, while anger serves as a potential trigger for violence towards others, aggression only occurs when an individual has the tendency to act rashly based on such emotions. Research indicates that this process not only applies to anger but negative affect generally. Indeed, evidence suggests that negative urgency fully moderates the relation between negative affect and aggression such that *only* individuals with high levels of negative urgency tend to act aggressively in the presence of negative affect, while those with low to no reported levels of negative urgency do *not* (Garofalo & Velloti, 2017). The dual significance of negative affect and negative urgency is consistent with Gross's process model (1998), in that individuals exposed to an emotional event that fail to utilize effective coping skills experience increasingly heightened negative emotionality at each step of the model. A strong desire to reduce such negative affect exists among those high in negative urgency, resulting in behavioral outbursts or other rash actions. When applied to aggression, rash action would represent engagement in reactive aggression. Such findings confirm the suspected way in which emotion dysregulation, and its associated negative affect, interacts with negative urgency in the production of aggression.

The relationship between negative urgency and reactive aggression has been explored in the literature on adult aggression. Specifically, two studies by Miller and colleagues (2003) and Hecht and Latzman (2015) indicated that reactive aggression in adults is characterized by high negative urgency. Interestingly, Hecht and Latzman (2015) went one step further to control for the significant correlation between reactive

and proactive aggression by utilizing the residual scores of each function of aggression in analyses. In this way, it is possible to assess "pure" reactive and proactive aggression that has the influence or shared variance of the other removed. Therefore, the results suggest that the tendency to act impulsively upon negative emotions is associated with instances of reactive aggression.

Together, the present research on emotion dysregulation and negative urgency with aggression informs the potential mechanistic role of negative urgency. Indeed, emotion dysregulation mediates the relationship between anger and aggression (Ammerman et al., 2015), as well as the relationship between ADHD and negative urgency (Mitchell et al., 2012). Further, negative urgency not only estimates aggressive behavior (Hecht & Latzman, 2015) but mediates the relationship between negative affect and aggression (Ammerman et al, 2015). By examining this series of events, it can be surmised that the relationship between emotion dysregulation and aggression is mediated by negative urgency, and that emotion dysregulation ties this process to children with ADHD. Additionally, this would indicate that children with ADHD, but not emotion regulation deficits, do *not* engage in reactive aggression. In sum, when children with ADHD that are high in emotion dysregulation experience negative affect, they fail to effectively utilize regulation strategies and experience increasingly stronger negative affect. In turn, this negative affect becomes increasingly harder to tolerate or regulate. Among those with moderate to high levels of negative urgency, a drive to act in order to reduce distress by whatever means possible occurs resulting in reactive aggression. The same is not true for proactive aggression, as no association between emotion dysregulation or negative urgency and proactive aggression exists.

Aggression, Social Information Processing, and Parenting in ADHD

Social Information Processing Factors and Aggressive Behavior

Given the separate and distinct theoretical bases of reactive and proactive aggression, research has posited that the two have divergent pathways of development. While reactive aggression is believed to emerge from emotional variables, such as emotion dysregulation and impulsivity, proactive aggression is often viewed and researched from the lens of learning and social cognition. The predominant model used to explain the social cognitive basis of proactive aggression is the social information processing model. The social information processing model is based in the landmark research conducted by social psychologists such as Bandura (1986) and was further refined by Crick and Dodge (1996). Social information processing theory suggests that there are six steps for decision making in any social situation: encoding (identifying social cues), interpretation (evaluating the motivation), goal clarification (determining the desired end result), response search (identifying all possible actions), response decision (evaluating the consequences and rewards, assess self-efficacy), and enactment (engaging in the selected behavior; Perry et al., 1986).

Difficulties at each of the steps of social information processing may result in aggressive behavior. The encoding and interpretation stages are often assessed together. Mistakes within the encoding stage often take the form of hypervigilance towards provocation or hostility, while errors during the interpretation stage are primarily encompassed by the hostile attribution bias. The hostile attribution bias is defined tendency to interpret other's actions as malicious or antagonistic (Dodge & Crick, 1990). Children who exhibit biases within either the encoding or interpretation stages exhibit

greater levels of externalizing behaviors than their peers without such biases (Lansford et al., 2006). Children identified by teachers as highly aggressive exhibit a greater likelihood of describing their peer's intents as hostile than those who were described as exhibiting lower levels of aggression (Guerra & Slaby, 1989). Indeed, one meta-analysis suggests hostile attributions were consistently related to aggressive behavior with large effect sizes (Orobio de Castro et al., 2002). Thus, the tendency to search for negative intent and misinterpret the intent of peers is significantly related to the tendency to engage in general aggressive behavior. However, the available work suggests that hostile attribution biases are not significantly related to proactive aggression (Dodge & Crick, 1990; Dodge & Coie, 1987). This may be the function of the nature of proactive aggression, in that proactive aggression occurs independent from provocation.

During the response search stage of social information processing, globally aggressive children produce fewer overall courses of action for obtaining a goal than their peers. Further, more of the responses produced are aggressive and fewer are competent behaviors (Slaby & Guerra, 1988). Additionally, children that are globally aggressive exhibit less flexibility in response generation such that they produce fewer alternative actions when prompted or when the first attempts at goal attainment were unsuccessful (Milich & Dodge, 1984). This indicates that the inability to generate non-aggressive means for attaining goals is pervasive and impervious to failed attempts. Overall, this imbalanced, limited set of options indicates that aggressive children lack the repertoire of effective goal-directed, prosocial behaviors. Research on this phenomenon in proactively aggressive children is scant, and therefore it is currently unknown if proactively aggressive children have difficulties producing prosocial or competent responses.

Difficulties among proactively aggressive children primarily occur in the lattermost stages of social information processing: the goal clarification, response evaluation, and response decision stages (Crick & Dodge, 1996). In terms of goal clarification, proactively aggressive children are less likely than their peers to value relationship-focused goals (e.g., friendships, improving group status), or communal goals and are more likely to value instrumental, self-focused, and agentic goals (e.g., obtaining materials, gaining power, status, or influence; Crick & Dodge, 1996; Salmivalli et al., 2005). Indeed, it is innate to the definition of proactive aggression that individuals are motivated by the possibility of gaining access to rewards for such behavior (Dodge & Coie, 1987).

In terms of the response evaluation and decision stages, research has consistently found that children, both male and female, who are proactively aggressive expect more positive and fewer negative outcomes from aggressive behavior than their peers (Arsenio et al., 2009; Crick & Dodge, 1996; Guerra & Slaby, 1989; Smithmeyer et al.,2000). When given a vignette and asked to evaluate how likely the use of an aggressive act in the vignette would lead to access to instrumental and social gains, proactively aggressive children reported expecting positive outcomes from the aggressive actions. However, the same was not true of reactively aggressive individuals (Crick & Dodge, 1996). This pattern remains true when assessing individuals that engage in more severe forms of aggression, as evidenced by research with incarcerated adolescents. Specifically, Smithmeyer and colleagues (2000) provided incarcerated aggressive adolescents with vignettes of potential interpersonal conflict and asked participants to rate how likely it is that engaging in aggression in the conflict would lead to positive outcomes. Potential

positive outcomes in this study included being liked and respected by the intended victim and peers, feeling good about the aggressive act, being harmed during the act, and if there would be sanctions as a result. When controlling for reactive aggression, *only* proactive aggression estimated greater biased outcome expectations (Smithmeyer et al., 2000). Further, proactively aggressive children demonstrate a high self-efficacy for engaging in aggressive acts and for attaining desired outcomes with their behavior, such that they endorse believing that they are capable of engaging in such behaviors in real life (Crick & Dodge, 1996). In sum, proactively aggressive children value instrumental goals that they believe are attainable through aggressive actions with minimal negative consequences, and strongly believe in their ability to carry out the aggressive actions for this purpose. Research suggests this process is not true of reactive aggression (Smithmeyer et al., 2000).

Such biases in proactive aggression may be related to a history of actual goal attainment and lack of sufficient consequences for the behavior, as well as over-valuing the potential rewards and under-valuing negative consequences. Indeed, proactively aggressive children tend to be described by their teachers as socially competent, popular, happy, and good at problem-solving (Day et al., 1992). Not only do teachers perceive this elevated social status, but peers as well (Hart et al.,1990). Comparatively, reactively aggressive children were more likely to be described as sad, less popular, and bad at problem-solving (Day et al., 1992). Thus, children who are proactively aggressive are experiencing the desired positive social rewards of their behavior. This may be compounded by the tendency for proactively aggressive individuals to socialize with other proactively aggressive youths, who in turn are more likely to socially reinforce acts

of aggression (Poulin & Boivin, 2000). Thus, proactively aggressive children are likely to receive the elevated social status and material gains that they desire, according to Dodge and Coie (1987).

Youth with ADHD are optimal for studying the relationships between aggression and social information processing factors, given the high rate of both social information processing deficits and global aggression among individuals with ADHD. Children with ADHD exhibit deficits in response generation, such that individuals produce a smaller set of potential responses to select from, with fewer of those responses being appropriate (Andrade et al., 2011; Matthys et al., 1999). This response generation deficit is exacerbated by the presence of comorbid oppositional defiant disorder (ODD) or conduct disorder (CD; Matthys et al., 1999), two conditions commonly comorbid with ADHD (Angold et al., 1999). In terms of the response decision bias, globally aggressive children with ADHD are 60% more likely than their peers to select aggressive actions than non-aggressive actions when given the option and anticipated fewer negative consequences of the selected behavior (Milich & Dodge, 1984; Bloomquist et al., 2009). Taken together, this suggests that children with ADHD demonstrate biased patterns of cognition regarding social situations and social problem solving that predisposes them to aggressive behavior in general, as well as proactive aggression specifically.

Overall, the extant research suggests that children with high rates of proactive aggression engage in such behavior as a consequence of poor social information processing at several steps. Given the high rates of social information processing deficits among children with ADHD and the importance of several social information processing biases in proactive aggression, social information processing may play a substantial role

in explaining proactive aggression among children with ADHD. However, such links have yet to be explored empirically.

Parenting Behaviors and Aggression

The examination of parenting styles, techniques, and behaviors is critical in understanding the development of externalizing behaviors, as well as designing preventative measures or treatments. Indeed, the current treatment for externalizing behaviors or conduct problems continues to be parenting behavior management training and parent-child interaction therapy (Kazdin, 2005; Lieneman et al., 2017). These treatments are predicated on the fact that certain parenting behaviors and techniques can be used to change their child's behavior through the use of positive attending, environmental structuring, and effective use of rewards and consequences. Thus, understanding the full scope of how parenting behaviors influence externalizing problems, such as aggressive behavior, is key.

The use of negative or aversive parenting practices has been consistently related to overall aggressive behavior among youths. Some commonly studied negative parenting behaviors include inconsistency in discipline (i.e., poor follow through with discipline) and corporal punishment use (i.e., physical discipline such as spanking; Frick, 1991). Inconsistent discipline has long been tied to aggression and conduct problems. Indeed, laboratory studies have indicated that individuals who receive inconsistent discipline for aggressive acts are more likely to continue engaging in aggressive behavior than their peers who receive consistent discipline (Deur & Parke, 1970; Sawin & Parke, 1979). The presence of inconsistent discipline and threats of discipline in proactive aggression has been studied. Specifically, inconsistent parenting significantly estimates

proactive aggression (Pederson & Fite, 2014) and moderates the association between ODD and proactive aggression. That is, individuals with ODD are more likely to engage in aggressive behavior to achieve an end goal in the presence of high parental inconsistency (Pederson & Fite, 2014). Overall, it is posited that in the presence of inconsistent discipline, children do not learn to associate aggression with negative repercussions. Instead, children learn that it may be effective at solving problems or attaining an instrumental goal at least some of the time.

The use of other punitive punishment techniques, such as spanking, has been a hotly debated topic in both the field of child psychology and in the general media (Clément & Chamberland, 2014). However, the current research indicates that corporal or physical punishment is tied to a plethora of negative childhood and adolescent outcomes. In fact, children who experience physical punishment exhibit greater behavioral problems, both concurrently and longitudinally (Slade & Wissow, 2004). Specifically, the use of corporal punishment has been associated with less prosocial behavior, more fighting with their peers, and bullying or victimizing others (Ohene et al., 2006; Verhoeven et al., 2010). Unfortunately, the use of corporal or physical punishment has not been studied in conjunction with proactive aggression itself. However, it would be expected to follow a similar pattern as undifferentiated aggression, as children may use their parents' behavior as a model for solving problems. Thus, children who exhibit proactive aggression may be inadvertently taught that aggressive behavior is an adequate method for dealing with the problems, annoyances, or misbehavior of others.

Positive parenting practices are also important to study. Commonly acknowledged positive parenting practices including parental involvement with their child (engagement

in activities), monitoring (i.e., supervision), and positive parenting techniques (i.e., using reinforcement; Frick et al., 1999; Essau et al., 2006). Aggressive behavior is inversely related to parental acceptance, monitoring, and directly related to psychological control or coercive manipulation (Finkenauer et al., 2005). That is, individuals who experience less parental acceptance, a lack of appropriate monitoring, and more coercive control tend to engage in more aggression. Conversely, those who experience positive parenting techniques tend to engage in less aggressive behavior overall. Interestingly, according to Mrug and colleagues (2008), such positive parenting may moderate the development of aggressive actions in a population that is at risk for engaging in aggression due to early pubertal development. Authors reported that aggression development occurred only in conditions of low positive parenting practices such as low levels of nurturing, low levels of communication, and low levels of parental knowledge of children's activities. Thus, it can be inferred that individuals with high nurturance, high communication, and transparency in children's actions would engage in less aggression, despite being in a group predisposed to aggression (Mrug et al., 2008). Of note, research indicates that reactive aggression is not similarly influenced by parenting behavior. Indeed, Fite and Colleagues (2014) reported that no positive or negative parenting behavior was associated with concurrent reactive aggression. Pederson and Fite (2014) later replicated this finding with a different sample of children, suggesting the finding is stable. Thus, it appears that parenting-related behavior serves as a risk factor *only* for proactive aggression.

Parenting children with ADHD often presents unique challenges, given pervasive difficulties with the cardinal symptoms of inattention, hyperactivity, and impulsivity as

well as school problems (Abikoff et al., 2002; Daley & Birchwood, 2009), social problems (Weihmeier et al., 2010), and comorbid internalizing and externalizing problems (Cuffe et al., 2017; Larson et al., 2011). Indeed, parents of children with ADHD exhibit greater levels of parenting stress, or stress that is associated with high parenting demands and low resources (Deater-Deckard, 2004). Such stress is directly tied to symptoms of ADHD and comorbid conduct problems, such that a greater number of symptoms is associated with higher parenting stress (Theule et al., 2013). Given high rates of stress and low level of resources, parents are often inconsistent with discipline and resort to negative or aversive practices. In fact, even when controlling for comorbid conduct problems, inconsistency in discipline and low parental involvement are associated with ADHD (Ellis & Nigg, 2009). Similarly, children with ADHD experience significantly more corporal punishment than their typically developing peers (Alizadeh et al., 2007). Unfortunately, positive parenting practices such as sensitivity, warmth, and positive regard are inversely related to ADHD (Koewn, 2012; Richards, 2013). That is, as ADHD symptoms increase there are observed decreases in parental sensitivity, warmth, and positive regard. Thus, given the likelihood that children with ADHD experience fewer positive and greater negative parenting strategies for controlling behavior, it may predispose this population to proactively aggressive behavior.

Social Information Processing and Parenting

Despite the significance of the social information processing model and parenting in proactive aggression, very limited research has merged these two areas of research. The majority of such work focuses on the transmission of social information processing skills from parent to child, specifically exploring maternal parenting practices and

maternal social information processing (Putallaz, 1987). For instance, children with parents who exhibit greater tendencies to make erroneous negative interpretations of their children's actions are more likely to exhibit poorer social problem-solving skills and less social competence than children with parents who do not make such negative interpretations. More specifically, maternal hostile attributions are associated with children producing and engaging in fewer prosocial solutions (Nix et al, 1999; Pettit et al., 1988). This is unsurprising, as child behavior and cognition tend to be shaped through their early childhood experiences, often taking place within the family. While the role of parenting and familial experience on the development of social information processing is important to developing preventative measures for at risk children, the inverse is important to study as well. Specifically, it is critical to understand if parenting practices facilitate or deter aggressive acts associated with a pattern of biases in social information processing. One available study by Hart and colleagues (1990) reported that children of parents that used physical punishments, threats, or inconsistent discipline were more likely to have more biased outcome expectations than their peers. Specifically, such children were more likely to expect that unfriendly or assertive social tactics would successfully resolve conflicts. Thus, the use of inconsistent or punitive parenting practices is associated with greater deficits within the response decision and evaluation stage.

To date, no such research has examined social information processing deficits and parenting behavior together in proactive aggression. Thus, research to assess the interaction of these two or the potential moderating factor of parenting on social information processing on aggression is important. Such information may assist in

refining and developing effective treatments. Children with ADHD and their families may provide an ideal sample for such research given the exacerbated challenges in parenting a child with ADHD, as well as the significant social information processing biases and heightened rate of aggression in this population.

The Current Study

The present study aims to elucidate the factors associated with reactive and proactive aggression among children with ADHD. Specifically, the study seeks to assess the association between emotion dysregulation, negative urgency, and reactive aggression as well as the role of the outcome expectancy bias during social information processing and parenting behaviors in proactive aggression. Ample research has demonstrated the links between emotion dysregulation (Calvete & Orue, 2012; Skripkauskaite et al, 2015) and negative urgency (Hecht & Latzman, 2015; Miller et al., 2012) with reactive aggression. Further research has demonstrated the presence of emotion dysregulation, negative urgency, and reactive aggression among individuals with ADHD (King et al., 2009a; Shaw et al., 2014). However, the literature has not directly tied these three constructs together into one cohesive model. To fill this gap, the proposed study aimed to explore how emotion dysregulation and negative urgency relate to concurrent reactive aggression among children with ADHD.

Additionally, the role of social information processing, and specifically the outcome expectancy bias, in proactive aggression has been well established. Specifically, proactively aggressive individuals overestimate the likelihood of positive outcomes of aggressive behavior (Arsenio et al., 2009; Crick & Dodge, 1996; Smithmeyer et al., 2000). Similarly, the role of negative parenting behaviors, such as inconsistent and

punitive punishment, has been studied among proactive aggression. Specifically, researchers report children who experience more inconsistent parenting exhibit higher proactive aggression (Fite et al., 2010; Pederson & Fite, 2014). However, no research to date has explored if parenting behaviors can attenuate the relationship between the outcome expectancy bias and proactive aggression, despite the fact that treatments focus on changing parenting behaviors. Thus, the current study aimed to examine the way in which parenting behaviors either facilitate or inhibit acts of aggression among individuals who exhibit the outcome expectancy bias.

Further, children with ADHD serve as an ideal population to assess the role of social information processing and parenting in proactive aggression given the unique hardships in both parenting children with ADHD and difficulties in social information processing (Andrade et al., 2011; Matthys et al., 1999), as well as the high rates of proactive aggression (King et al., 2009) that children with ADHD exhibit. The present study aimed to assess these phenomena in youths between the ages of 8 and 14 years of age given the heightened prevalence of reactive and proactive aggression during middle childhood and preadolescence (Kempes et al., 2005; McCauliffe et al., 2007; Vitaro & Brendgen, 2005).

Study Aims and Hypotheses

The present study aimed to assess a novel model of aggressive behavior among children with ADHD. The COVID-19 global pandemic emerged after data collection was partially completed in March 2020. At that time, it was deemed unsafe to continue in-person data collection. It was later concluded that participant data collected pre-pandemic may not be comparable to participant data collected in the midst of the pandemic as a

result of the changes to children's social environment (i.e., shift to virtual schooling, social distancing protocols, etc.) and ability to engage in behaviors assessed in the present study. Thus, data collection was prematurely discontinued. One of the original analyses proposed was therefore underpowered in its ability to detect meaningful relationships. Thus, a revised aims and set of hypotheses that the present data are powered to detect are presented below, followed by the original aim and hypotheses presented as exploratory hypotheses.

Revised Aims and Hypotheses.

Given limitations of the present data, the following aim and hypotheses are provided.

Revised Aim 1. Examine factors contributing to reactive aggression.

Hypothesis 1a. Both emotion dysregulation and negative urgency will significantly estimate concurrent reactive aggression among children with ADHD.

Hypothesis 1b. Emotion dysregulation will not significantly estimate concurrent proactive aggression among children with ADHD.

Aim 2. Examine the relationship between social information processing, parenting, and proactive aggression.

Hypothesis 2a. Outcome expectancy bias will significantly estimate proactive aggression among children with ADHD.

Hypothesis 2b. Parenting variables will significantly estimate proactive aggression. Specifically, it is hypothesized that inconsistent discipline, poor monitoring/supervision, and corporal punishment will positively estimate proactive aggression, while positive parenting and parental involvement with negatively estimate proactive aggression.

Hypothesis 2c. Parenting practices will significantly moderate the effect of the outcome expectancy bias in the estimation of proactive aggression. Specifically, it is hypothesized that inconsistent discipline, poor monitoring/supervision, and corporal punishment will positively moderate the relationship, such that children with greater outcome expectancy bias scores will exhibit greater proactive aggression in the presence of inconsistent discipline, poor monitoring/supervision, and corporal punishment. Conversely, it is hypothesized that positive parenting and parental involvement with negatively moderate the relationship, such that children with greater outcome expectancy bias scores will exhibit less proactive aggression in the presence of positive parenting and parental involvement.

Original Aim and Hypotheses

The following original aim and associated hypotheses were substantially underpowered to detect effects. However, as a demonstration of competency, the following aim associated hypotheses are presented below.

Aim 3. Examine the relationship between emotion dysregulation, negative urgency, and reactive aggression.

Hypothesis 3. Emotion dysregulation will be associated with concurrent reactive aggression both directly and through negative urgency among children with ADHD.

Hypothesis 3a. A direct effect of emotion dysregulation on reactive aggression among children with ADHD will be observed

Hypothesis 3b. A direct effect of emotion dysregulation on concurrent negative urgency among children with ADHD will be observed.

Hypothesis 3c. A direct effect of negative urgency will be associated with concurrent reactive aggression among children with ADHD.

Hypothesis 3d. The relation between emotion dysregulation and reactive aggression will become non-significant when negative urgency is entered into the model.

CHAPTER II

METHOD

Participants

Thirty-one children between the ages of 8 and 14 years old and their parents were recruited from the general community in Louisville, Kentucky. Recruitment began in fall 2019. Recruitment was originally scheduled to proceed through May 2020 but was prematurely concluded in March 2020 due to the onset of the COVID-19 global pandemic and subsequent university-mandated shut-down of in-person research and shift to virtual schooling environments for children. Eligibility was limited to children with a pre-existing diagnosis of ADHD or whom a diagnosis of ADHD was suspected. Children were ineligible if they had a pre-existing diagnosis of Autism Spectrum Disorder (ASD) or an intellectual disability, defined herein as an FSIQ of 70 or below, as these disorders could interfere with the child's ability to comprehend all instructions, measures, and tasks. Additionally, participants were ineligible if they had not lived with a permanent parent/guardian for at least the last two consecutive years as several of the measures and tasks ask parents/guardians to recall information about changes in children's behavior and functioning over the past several years. Finally, children who are homeschooled were excluded from the present study as several of the vignettes are school-based and children without experience in non-elective, school-based social interactions may not be able to adequately visualize the content in order to respond.

In total, 45 participants were scheduled to enroll in the study: 31 participants completed study procedures, while seven participants that had been scheduled for study visits were unable to complete study procedures and seven additional patients that had initiated contact and expressed intent to enroll in the study were not able to be scheduled due to the shut-down at the onset of the COVID-19 pandemic. Of the 31 that participated, three did not meet criteria for ADHD and were therefore excluded from further analysis. Thus, the final sample was comprised of 28 children with ADHD and their parents (n = 15 males, n = 13 females) ages 8-14 (M age = 10.75, sd = .347). Further, one child's self-report data were excluded from analysis due to random answering and one child discontinued the SIP task early due to illness. Thus, data from those measures are excluded from the respective analyses. In total, 27 children's data were viable to test study hypotheses.

The ethnic composition of the sample (71.4% Caucasian, 10.7% African-American, 17.9% biracial) was similar to the Louisville/Jefferson County population. The ethnic composition of Louisville/Jefferson County is as follows: 68.3% Non-Hispanic White/Caucasian, 22.9% Non-Hispanic Black/African American, 4.5% Hispanic/Latino, and 2.3% Asian/Pacific Islander (United States Census Bureau, 2010).

Recruitment

Children with a prior ADHD diagnosis and children exhibiting symptoms of ADHD and their parents were recruited through community advertisements in local publications (i.e., U of L today magazine and other community-oriented publications) and through lab social media channels (i.e., the lab website, Facebook, Twitter, etc.). Flyers describing the study were distributed to school personnel in private and public schools in

Louisville and neighboring counties (i.e., school counselors, school psychologists, teachers, etc.) to provide to parents of children within the age range and those expressing concern regarding ADHD symptoms. Flyers were sent directly to organizations to distribute to parents. As such, study personnel did not have contact with potential participants and/or their families who received flyers through school. Finally, flyers were distributed via email to participants from previous research studies in the RACER Lab that previously expressed interest in taking part in future research studies. Flyers specifically recruited children with diagnosed or suspected ADHD and instructed parents to contact study personnel via phone or email for further information.

Procedures

All study procedures were approved by the University of Louisville Institutional Review Board prior to recruitment or data collection. Children and their parents were asked to attend one session lasting approximately 2.5 hours at the RACER Lab at the University of Louisville. Prior to the initiation of study procedures, parents provided informed consent and children provided assent. At that time, parents were also asked to identify one teacher to complete measures and completed a release of information form. An email containing information about the study, a copy of the release of information, and a link to the measures to be completed via Redcap was sent to the identified teacher immediately following parents' in-office visit. Teachers who did not complete measures were contacted a second time after two weeks to provide them with a reminder. Of note, teacher participation was not required, and families were not penalized if they elected not to select a teacher or if the teacher did not return measures. Of the 31 participants who

completed study procedures, 22 teachers (70.97%) returned measures. Of the 28 children with ADHD, 21 teachers (75%) returned measures.

Following completion of consents and assent, parents and children were guided into two separate rooms in the laboratory. Parents were administered the Diagnostic Interview Schedule for Children Parent-Report (DISC-P; Shaffer et al., 2000) to assess symptoms of ADHD. The DISC-P was administered by a doctoral student in clinical psychology who had been previously trained. After completing the diagnostic interview, parents completed electronic questionnaires via RedCap to assess their child's aggressive behavior, impulsivity, and emotion regulation, as well as their parenting style.

While parents completed the diagnostic interview, children completed a series of electronic questionnaires via RedCap regarding their aggressive behavior, emotion regulation, and impulsivity. Assisted by a researcher, children then completed a series of tasks, including responding to social vignettes designed to assess children's social information processing and a task designed to assess reactive and proactive aggression in children.

Following participation, families received a $20 prepaid gift card and children were provided with a small prize as a reward for participation. Four weeks after participation, parents were also provided with a free psychodiagnostic report with the results of the interview, a summary of the measures of social, behavioral, and emotional functioning, and the results of the brief IQ test, as well as recommendations for home, school, and treatment.

Measures

Diagnostic Measures.

Parents were administered two measures of ADHD diagnostic status: the Diagnostic Interview Schedule for Children-Version IV Parent Report (Shaffer et al., 2000), and the Vanderbilt ADHD Parent Report Scale (Wolraich et al., 2013). Teachers were administered the Vanderbilt ADHD Teacher Report Scale (VATRS; Wolraich et al., 1998). Each assesses the presence of symptoms of ADHD; however, the Diagnostic Interview Schedule for Children-Version IV asks parents respond on a dichotomous yes/no basis while the parent and teacher-report Vanderbilt scales asks respondents to rate the frequency (i.e., never, occasionally, often, very often) that the participant exhibits each symptom. Children were diagnosed with ADHD if they either met the criteria for ADHD on the DISC-P or met partial criteria for ADHD on the DISC and met criteria for ADHD either on the parent or teacher Vanderbilt rating scales.

Diagnostic Interview Schedule for Children-Version IV, Parent Report (DISC-P). The DISC-P (NIHM, 1997; Shaffer et al., 2000) is a computerized diagnostic structured interview that was administered to parents to assess for symptoms of ADHD. Children's diagnostic status was determined by assessing for the presence of inattentive, hyperactive, and impulsive symptoms, as well as the length of time that symptoms have been present, the settings in which they occur, and the level of impairment caused by symptoms. The DISC-P generates diagnoses based on the diagnostic criteria for ADHD from the DSM-IV (APA, 1994). An updated version reflecting DSM-5 diagnostic criteria has not been released at this time; however, changes to the diagnostic criteria for ADHD between the DSM-IV and the DSM-5 were minimal. Thus, it continues to be considered a valid and reliable method for assessing ADHD symptoms. Psychometrically, prior research indicates that the DISC-P demonstrates good 1-year test-retest reliability for

ADHD in clinical samples (r =.79; Shaffer et al., 2000) and good convergent validity with the Brown ($\chi^2 = 5.43$, $p < .05$), Connors parent rating scale ($\chi^2 = 5.02$, $p < .05$), and Connors parent rating scale ($\chi^2 = 6.11$, $p < .05$; McGrath et al., 2004).

Vanderbilt ADHD Parent Report Scale (VAPRS; Wolraich et al., 1998). The VAPRS is a 55-item DSM-IV based scale that assesses parent's perceptions of their child's ADHD symptoms. A symptom count is derived from the number of endorsed items, with items rated as "very often" or "often" counted as present symptoms, while items rated "never" or "sometimes" are considered absent symptoms. The VAPRS was used to confirm the participant's ADHD diagnostic status, as noted above. Prior research indicates good internal consistency for both the inattentive and hyperactive/impulsive factors, with coefficient alphas ranging from .72 to .85 (Wolraich et al., 1998). In the present sample, both the inattentive subscale (Cronbach's alpha = .88) and hyperactive/impulsive subscale (Cronbach's alpha = .88) exhibit excellent reliability.

Vanderbilt ADHD Teacher Report Scale (VATRS; Wolraich et al., 1998). The VATRS is a 35-item DSM-IV based scale that assesses teacher's perceptions of their student's ADHD symptoms at school. A symptom count is derived from the number of endorsed items, with items rated as "very often" or "often" counted as present symptoms, while items rated "never" or "sometimes" are considered absent symptoms. The VATRS was used to confirm the participant's ADHD diagnostic status, as noted above. Prior research indicates the inattentive scale (Cronbach's alpha = .96) and hyperactive/impulsive scale (Cronbach's alpha = .95) demonstrate excellent internal consistency (Wolraich et al., 2013). Further, prior work indicates that the teacher report is moderately, yet significantly, correlated with the parent-report version of the measure

(inattentive scale r = .33, $p \leq .05$; hyperactive/impulsive scale r = .29, $p \leq .05$; Wolraich et al., 2013). In the present sample, both the inattentive subscale (Cronbach's alpha = .93) and hyperactive/impulsive subscale (Cronbach's alpha = .93) exhibit excellent reliability.

Background Measures

Pubertal Development Scale (PDS; Peterson et al., 1998). The PDS is a 6-question parent-report measure designed to assess children's current stage of pubertal development. Parents are asked to rate children's progress in several developmental domains. The scale consists of four questions (e.g., change in height, change in body hair, change in skin, is their development earlier or later than their peers) answered for both males and females. The questionnaire then consists of two separate sets of questions for males (e.g., deepening of voice, facial hair growth) and females (e.g., breast development, menstruation) that reflect sex-specific domains. Items are averaged to create a global pubertal development rating. Prior research indicates the reliability of the overall scale is good and stable over time, with Cronbach's alphas ranging from .72 to .83 (Peterson et al., 1998). In the present sample, the reliability of the PDS was poor (Cronbach's alpha = .45). Prior research indicates that the reliability of the sample improves as the sample ages, such that the scale demonstrates greater reliability among middle-school children than primary school children (Peterson et al., 1998). It is hypothesized that this is due to the inconsistency with which puberty happens. For instance, younger children may be showing changes in skin or body hair but not yet reach menstruation. Thus, the poor reliability of the present sample may be representative of the lower age limit and age variability of the present study.

Impulsivity Measures.

UPPS Impulsive Behavior Scale – Child Report (UPPS-P-C; Zapolski et al., 2010). The UPPS Impulsive Behavior Scale – Child report is an adaptation of the UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001). The total number of items was reduced, and the language of the remaining items was modified to meet a 4th-grade reading level. The UPPS-P-C is a 40-item measure assessing positive urgency ("I tend to act without thinking when I am very, very happy"), negative urgency ("I often make matters worse because I act without thinking when I am upset"), lack of premeditation ("I tend to blurt out things without thinking"), lack of perseverance ("I tend to stop and think before doing things"), and sensation seeking ("I like new, thrilling things to happen"). The UPPS-P-C was used in the present study as an indicator of negative urgency; Thus, while the entire measure (40 items) was administered, only the negative urgency subscale (8 items) was used in the present analyses. In the measure, Children are asked to rate how much they believe each statement is true of them on a 4-point Likert scale ("Agree Strongly," "Agree Some," "Disagree Some," or "Disagree Strongly"). Prior research indicates that the scales of the UPPS-P-C demonstrate excellent internal consistency (sensation seeking Cronbach's alpha =.73; negative urgency Cronbach's alpha = .81, lack of planning Cronbach's alpha = .75, and lack of perseverance Cronbach's alpha =.58). The child-report UPPS-P-C has been used in research with children with ADHD (Guerten et al, 2018). Within the present sample, the negative urgency subscale demonstrated excellent internal consistency (Cronbach's alpha = .866).

UPPS Impulsive Behavior Scale – Parent Report (UPPS-P-P; Zapolski & Smith, 2013). The UPPS Impulsive Behavior Scale – Parent Report is an adaptation of the UPPS

Impulsive Behavior Scale – Child Report (Zapolski et al., 2010). The language was modified to reflect the parent as the primary reporter, such that items state "my child" or "your child." The UPPS-P-C is a 40-item measure assessing positive urgency ("My child tends to lose control when he/she is in a great mood"), negative urgency ("When your child feels bad, he/she often does things he/she later regrets in order to make themselves feel better now"), lack of premeditation ("Sometimes your child does crazy things he/she later regrets"), lack of perseverance ("Your child likes to see things through to the end"), and sensation seeking ("Your child would enjoy fast driving"). While the entire measure was administered in the present study, only the negative urgency subscale was utilized for present analyses. On the measure, parents are asked to rate how much they believe each statement is true of their child on a 4-point Likert scale ("Agree Strongly," "Agree Some," "Disagree Some," or "Disagree Strongly"). Extant research indicates that the parent-report version of the UPPS-P-C exhibits excellent internal consistency (sensation seeking Cronbach's alpha =.90, negative urgency Cronbach's alpha =.87, lack of planning Cronbach's alpha =.84, and lack of perseverance Cronbach's alpha = .80; Zapolski & Smith, 2013). Within the present sample, the negative urgency subscale of the parent-report measure demonstrated excellent internal consistency (Cronbach's alpha = .90).

Emotion Regulation Measures.

Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). The ERC is a 24-item parent-report questionnaire that assesses children's emotion regulation and emotional negativity/lability. Parents are asked to rate on a four-point Likert scale ("never", "sometimes", "often", "almost always") how well each item describes their

child's emotional responses. Responses yield two subscales: Emotional Lability/Negativity ("responds negatively to neutral or friendly behavior by peers") and Emotion Regulation ("Displays energy or emotion that others find intrusive or disruptive"). While the entire measure (24 items) was administered, only the emotion regulation subscale (15 items) was used in the present analyses. Items assessing positive emotion regulation were reverse scored, thus higher scores on the emotion regulation subscale are indicative of greater dysregulation. Prior research indicates with the ERC has excellent internal consistency (Lability/Negativity Cronbach's alpha = .96, Emotion Regulation Cronbach's alpha = .83; Shields & Cicchetti, 1997). The ERC has been used extensively to assess emotion regulation in research with children with ADHD (Rosen et al., 2019; Meinzer et al., 2018; Seymour et al., 2012; Bunford et al., 2017; Lugo-Candelas et al 2017; Graziano et al., 2011). Within the present sample the subscale of interest, emotion regulation, demonstrated excellent internal consistency (Cronbach's alpha = .90).

Emotion Regulation Checklist – Teacher Report (tERC): The tERC is a 24-item parent-report questionnaire that assesses teacher's perceptions of their student's emotion regulation and emotional negativity/lability. Of note, this measure was adapted from the parent-report version and features identical questions with the exception of changing "child" to "student." Teachers are asked to rate their child on a four-point Likert scale regarding their student's emotional responses, and responses yield two subscales: Emotional Negativity/Lability ("has mood swings") and Emotion Regulation ("can say what he/she is feeling when he/she is sad, angry, mad, or afraid"). While the entire measure (24 items) was administered, only the emotion regulation subscale (15 items)

was used in the present analyses as a measure of children's emotion regulation at school. While the tERC has not been validated on its own, its parent measure demonstrates excellent internal consistency and is widely used to assess emotion regulation in children in the literature (Shields & Cicchetti, 1997). Further, the tERC has been used with success in the literature up to this point (Molina et al., 2014; Shields & Cicchetti, 2001; Shields & Cicchetti, 2004). Within the present sample the subscale of interest, emotion regulation, demonstrated excellent internal consistency (Cronbach's alpha = .88).

Emotion Regulation Index for Children and Adolescents (ERICA; MacDermott et al., 2010). The ERICA is a 16-item self-report questionnaire designed to assess children's ability to regulate and manage emotions. Of note, the ERICA was originally adapted from the ERC. The ERICA asks children to rate their emotion regulation skills on a five-point Likert scale ("Strongly Disagree," "Disagree," "Neither Agree or Disagree," "Disagree," and "Strongly Agree"). The questionnaire three subscales: Emotional Control ("When things don't go my way I get upset easily."), Emotional Self-Awareness ("I am a happy person"), and Situational Responsiveness ("When adults are friendly to me, I am friendly to them."). A general emotion dysregulation composite is also generated. The general composite was used in the present study as a measure of child self-reported emotion dysregulation. Higher scores on the ERICA composite score indicate more emotion dysregulation. Research has indicated that the ERICA has good internal consistency (Cronbach's alpha = .75) as well as test-retest reliability (r = .77; MacDermott et al., 2010). Further, the ERICA has adequate convergent validity, such that the total score was significantly positively correlated with guilt (r = .38, $p \leq .001$) and empathy (r = .29, $p \leq .001$), and negative correlated with shame (r = -.27, $p \leq .001$)

and depression (r = -.60, $p \leq .001$; Bunford et al., 2014). The ERICA is a commonly used measure to assess emotion regulation among children with ADHD (Bunford et al., 2018; Bunford et al., 2014). In the present study, the general composite score demonstrated excellent internal consistency (Cronbach's alpha = .85).

Aggressive Behavior.

Reactive-Proactive Anger Questionnaire (RPAQ; Raine et al., 2006). The RPAQ is a 23 item self-report inventory that asks participants to rate how frequently they act in an angry or aggressive manner towards other children on a three-point scale ("never" to "often"). Two subscales are derived from this measure: Reactive Aggression (RA; "Reacted angrily when provoked by others") and Proactive Aggression (PA, "Damaged something for fun"). The RPAQ was used to provide an assessment of children's perceptions of their aggressive behavior. Research indicates the measure has good internal consistency (reactive aggression subscale Cronbach's alpha = .81; proactive aggression subscale Cronbach's alpha = .84; Raine et al., 2006). The RPAQ also demonstrates good convergent and divergent validity, as both the reactive and proactive aggression subscales were significantly positively correlated with CBCL reported aggression and delinquency, and child-reported hostile aggression, while not correlated with CBCL-reported withdrawal, somatic complaints, social problems, or thought problems (Raine et al., 2006). The RPAQ has been used in several studies assessing aggression among children with ADHD (Slaughter et al., 2019, Bilgiç et al., 2017; Factor et al., 2013; Tamm et al., 2019). Both the RA subscale (Cronbach's alpha = .815) and the PA subscale (Cronbach's alpha = .87) in the present study demonstrated excellent internal consistency.

Antisocial Behavior Scale – Parent Report (ABS-P; Brown et al., 1996; Kaat et al., 2016). The ABS-P is a 28-item parent-report measure assessing reactive and proactive aggression in their child. The measure asks parents to rate on a 3-point Likert-type scale ('Never' to 'Very Often') how often their child engages in social behaviors with other children. Two subscales are derived from this measure: reactive ("gets mad when corrected") and proactive aggression ("picks on kids smaller than he or she is"). The measure was originally developed for teachers by Brown and colleagues (1996). The language was changed to reflect parents as the responder (i.e., "your child") by Kaat and colleagues (2016). The ABS-P was used in the present study as an indicator of children's reactive and proactive aggressive behavior. Research by Kaat and colleagues (2016) on the psychometric properties of the measure indicated that the ABS-P has good convergent validity with aggression-related subscales, such that both RA and PA scales are significantly positively correlate with anger irritability (PA: $r = .43$, $p \leq .001$; RA: .53, $p \leq .001$), peer conflict (PA: $r = .69$,: $p \leq .001$; RA: .27, , $p \leq .001$), ODD (PA: $r = .54$, $p \leq .001$; RA: $r = .59$, $p \leq .001$) and CD (PA: $r = .69$, RA: $p \leq .001$; .35, , $p \leq .001$). Both the RA subscale (Cronbach's alpha = .78) and the PA subscale (Cronbach's alpha = .77) in the present study demonstrated good internal consistency.

Teacher Rating Scale for Reactive and Proactive Aggression (TRPA; Dodge & Coie, 1987). The Teacher Rating Scale for Reactive and Proactive Aggression (TRPA) is a 6-item teacher-report measure that asks teachers to indicate the frequency with which their student engages in a series of aggressive behaviors on a 5-point scale ("Never" to "Almost Always"). The measure provides both a reactive aggression subscale ("The child always claims that other children are to blame in a fight and feels that they started the

trouble") and proactive aggression subscale ("The child threatens or bullies others in order to get his/her own way"). The TRPA is the first and most widely used measure of reactive and proactive aggression for teachers in the extant literature (Dodge & Coie, 1987). The TRPA was used in the present study as an indicator of reactive and proactive aggression at school. Prior research suggests the TRPA demonstrates adequate internal consistency (PA Cronbach's alpha = .87, RA Cronbach's alpha =.64; Dodge & Coie, 1987). Further, the measure demonstrates good validity, such that children who scored high on either the RA or PA scales received significantly higher peer-ratings for being angry ($F = 6.66$, $p < .001$) and starting fights ($F = 13.28$, $p < .001$; Dodge & Coie, 1987). The TRPA has been utilized extensively throughout the aggression literature to assess reactive and proactive aggression. Both the RA subscale (Cronbach's alpha = .94) and the PA subscale (Cronbach's alpha = .90) in the present sample demonstrated excellent internal consistency.

Parenting Measures

Alabama Parenting Questionnaire (APQ; Frick, 1991). The Alabama Parenting Questionnaire is a 42-item parent-report measure that asks parents to indicate the frequency at which they engage in a series of parenting behaviors. Parentings respond on a 5-point Likert-type scale ("never" to "always"). Five subscales are derived from this measure: parental involvement ("You volunteer to help with special activities that your child is involved with"), poor supervision and monitoring ("You don't check that your child comes home at the time he/she was supposed to"), use of positive discipline techniques ("You tell your child you like it when she/he helps out"), inconsistency in the use of discipline ("you threaten to punish your child and then do not actually punish

him/her"), and use of corporal punishment techniques ("you spank your child when he/she has done something wrong"). The APQ was used in the present study as a measure of parenting behaviors. In initial validate studies, the positive involvement (Cronbach's alpha = .80), positive parenting (Cronbach's alpha = .80), poor monitoring/supervision (Cronbach's alpha = .67), and inconsistent discipline (Cronbach's alpha = .67) demonstrated adequate internal consistency; however, the corporal punishment demonstrated low internal consistency (Cronbach's alpha = .46; Shelton et al., 1996). Similarly, in the present study the positive involvement (Cronbach's alpha = .74), positive parenting (Cronbach's alpha = .74), and inconsistent discipline (Cronbach's alpha = .71) subscales demonstrate adequate internal consistency and the poor monitoring/supervision (Cronbach's alpha = .64), and corporal punishment (Cronbach's alpha =.38) demonstrate poor internal consistency. Due to poor reliability, the poor monitoring/supervision and corporal punishment subscales were excluded from analyses in the present study.

Social Information Processing.

Social Vignettes

The use of social vignettes has been well-validated to assess the steps of social information processing (SIP; Dodge et al. 2002; Dodge et al., 1997; Helseth et al., 2015; Andrade et al., 2012). The use of vignettes to assess SIP has previously been used with both males (Milich & Dodge, 1984) and females (Mikami et al., 2008) with ADHD (Andrade et al., 2012) and conduct problems (Helseth et al., 2015). The present task and associated coding were developed by Andrade and colleagues (2012). All items in each administration of the task are randomized to preclude order effects from biasing the data.

The vignettes in the present task represent social situations in which the protagonist in the vignette is interacting with their peers during school, sports, or when engaging in other common youth social activities. The vignettes are designed to vary in regard to the peer intent and outcome. For intent, the scenarios are either positive, negative, or ambiguous. For outcome, the outcome for the protagonist is either negative, positive, or ambiguous as well. Vignettes were gender- and age-matched to the participant based on the participant's school grade. A full list of vignettes are listed in Appendix A; however, one example vignette reads as follows:

"Pretend that you are walking down the hallway in school. You're carrying your books in your arm and talking to a friend. Suddenly, a kid named Brittany bumps you from behind. You stumble and fall, and your books go flying across the floor. The other kids in the hall start laughing"

Administration: Participants were seated at a small table across from the examiner. The examiner instructed participants to pretend that they are the protagonist, or leading character, in the stories. The examiner read the vignette stories in a randomly generated order. After each story, the participants were asked a series of questions to evaluate cue detection, intent attribution, response generation, and response evaluation. Specifically, the children were asked: 1) What happened in the story? 2) How could you tell whether this was a nice way to act or a mean way to act? 3? How would you feel if X did this to you, 4) What could you say or do if this happened to you? Tell me as many ways as you can, and 5) What would happen if you did that? Questions 4 and 5 were used in the present study to assess the outcome expectancy bias.

To begin the task, the administrator read the following practice vignette to the participants: “Pretend that you really like candy, and your best friend Sophia/Sam gives you a whole bag of candy.” The participant was then be asked to answer the questions listed above. The administrator then stated “Now I am going to read some other stories to you, followed by the same type of questions. Let me know what your answers are, and I will write them down on these pages. Let’s begin.” The examiner then administered each of the vignettes in randomized order.

Coder Training: Two graduate research assistants were trained on the coding procedures. During training, coders were provided with detailed instructions on the coding worksheet, including example responses for each question. Each coder was then asked to code an example vignette alongside the administrator of the study and given feedback as well as a chance to ask questions. Coders were then asked to complete a sample response set independently and corrective feedback was provided.

To assess reliability and coder drift, approximately one-third of the response sets were coded by both coders and reliability statistics were conducted. If poor reliability or coder drift occurred, then two coders and the primary administrator would have then met prior to any further coding to discuss any discrepancies in coding and to receive corrective feedback. Interrater reliability was assessed using a two-way mixed, absolute agreement, single-measures ICC (McGraw & Wong, 1996) on the response sets that were dually coded. ICC for the measure was excellent (ICC = .97) indicating that coders had an adequate to high degree of agreement in coding. In the case that reliability was not found to be acceptable (ICC ≤ .60; Cichetti, 1994), a third coder would have been asked to act as a second-rater for all response sets.

Vignette sets were randomly assigned to be coded by either coder one or coder two. Throughout the study, each vignette set was solely identified by the participant's study ID and vignette set (e.g., female middle school vignettes); thus, each coder was blinded as to the participant's demographic information, diagnostic status, and responses to all other measures. Neither coder had contact with any participants at any point during the data collection, therefore preventing any biases in the coding system.

Coding Procedures: Two graduate research assistants coded the participant's transcribed responses. Coders were provided with transcriptions identified by the participant's study ID number only as to blind coders to the participant's information such as diagnoses, results of participant's measures, or aggressive behavior.

For the first question, "what happened in the story" the coder determined the valence of the child's description on a four-point scale (0 = neutral, 1 = negative, 2 = positive, 3 = mixed). The coder then counted the total number of positive, negative, and neutral cues in the participant's description. Responses from this question can be used to assess both attention to the task and encoding step of SIP; specifically, it may be used to assess if the participant is biased to the positive or negative cues in the story.

For the second question, "How could you tell whether this was a nice way to act or a mean way to act?" the coders first coded valence of the overall response (0 = no response, 1 = mean, 2 = nice, 3 = mixed/neither). The administrator then coded each cue in the participant's response for the perceived intent of the child in the story (0 = neutral or no reference to intent 1 = negative reference to intent, 2 = positive reference to intent, 3 = mixed reference to intent). Coding from this question can be utilized to assess the presence of hostile attribution biases.

For the third question "How would you feel if x did this to you?" the coders identified how the valence of the emotion that the participant reported (0 = neutral or indifferent, 1 = negative, 2 = positive, 3 = mixed). Emotions generally included under the umbrella term "negative affect" were coded as "negative," such as: sad, anxious, nervous, fearful, upset, frustrated, angry, guilty, irritated. Emotions generally included under the umbrella term "positive affect" were coded as "positive," such as: proud, excited, enthusiastic, thankful, happy, or content. Responses from this question do not provide information on the SIP steps but may be utilized to assess emotional responses to perceived provocation.

For the fourth question "What could you say or do if this happened to you?" the coders assessed the valence of each response on a three-point scale (0 = neutral/irrelevant, 1 = negative, 2 = positive) as well as the target of the child's response (1 = peer in the vignette, 2 = adult, 3= other such as object or animal, 4 = none, such as I would walk away) and relevance of the response (0 = irrelevant, 1 = relevant). Responses from this question provides a score for the response search stage of SIP.

Finally, for the fifth question "What would happen if you did that" the administrator coded anticipated outcome of each response from question four (1 = negative, 2 = positive, 3 = irrelevant). Responses from this question provides a score for the response decision stage of SIP. More specifically, it assesses participant's ability to evaluate the consequences and rewards of their actions and provides an outcome expectancy bias score. This score was utilized in the present study.

Reactive-Proactive Aggression Task.

The Reactive-Proactive Aggression Task was developed by King et al., (2009) to assess reactive and proactive aggression among children with ADHD. During the task children were challenged to play a reaction speed game against a fake opponent, and during each win were allowed to punish the other player by taking away the "opponents" points. Participants were gender-matched with the opponent, such that the males were told they were playing a boy and females we told they were playing a girl. The task was based on the Taylor Aggression task (Taylor & Gammon, 1975), originally designed to assess aggression in children and adults. However, the Taylor Aggression task does not allow researchers to specifically assess the subtypes of aggression, instead solely assessing the tendency toward globally aggressive behavior. Given the similarities between the Taylor Aggression task and the present task, King and Waschbusch (2010) report that the task is similarly valid and comparable to versions used in prior research (Atkins et al., 2001). The Reactive-Proactive Aggression Task has been successfully utilized to measure reactive and proactive aggression with children with ADHD between the ages of 6 and 12 (King et al., 2009).

At the outset of the task, participants were told they were playing a button-pressing game against another child and needed to press the space bar faster than the other child when the stimulus was presented in order to win. Specifically, participants were told:

"You are now going to be competing in a game with another participant over the internet. They are in another room in the building. A bulls-eye target is going to appear on your screen. To play, press the space bar as fast as possible when it appears. If you

press the space bar faster than the other child, you will win 10 points and be given the opportunity to take between 0 and 10 points from the other child and send the other child a message over our messaging system. The other child has the same options if they win."

To ensure participants understood the instructions, they were asked to repeat back details of the instructions. For instance, participants were asked "what button do you press when the bullseye comes on the screen?" and "what happens if you win?" If participants were unable to answer these questions, then the instructions were repeated. Following each winning trial, the computer asked participants how many points ranging from 0 to 10 points they would like to take away from their opponent and prompted them to send a message to their opponent. Participants were able to free-type their answers into the response box.

In total, 28 trials were administered, with eight pre-programmed to be losing trials and 20 pre-programmed to be winning trials. Each administration began with four consecutive winning trials, used to assess proactive aggression. Losing trails then occurred at pre-determined intervals and were followed with a message from the opponent that states the number of points taken from them. Four of the messages are categorized as "high provocation" in that they contain an aversive message (ex: "Is your hand stuck in cement?") and a loss of 8, 9, or 10 points. The other four messages are categorized as "low provocation" in that they contain a non-aversive message (ex: "you lost, but nice try!") and a loss of 0, 1, or 2 points. See appendix B for full details of the win/loss schedule, the number of points lost, and messages "sent" by the opponent.

Coding Procedures: The program, E-prime 3, recorded the number of points children took from the opponent during winning trials. For this purpose, reactive

aggression is operationalized as points taken away from the other opponent in the first winning trial after a losing trial. Proactive aggression in this task is operationalized as points taken away from the other opponent in the first four trials of the tasks when the child has a winning trial, prior to any provocation or loss. Following the aggression task, children were debriefed as to the deceptive nature of the task and led through cool down skills.

Validity Concerns: Preliminary analyses of data suggest a lack of buy-in and poor ecological validity of the aggression task. During the task, participants often greeted their opponent (e.g., "hi") and asked questions about their opponent (e.g., "how are you"). Given the pre-programmed nature of the computerize opponent's messages, these questions remained unanswered. This lack of response appeared to substantially influence participant's buy-in for the task. Indeed, following these trials, many participants made statements that questioned the true identity of their opponent. For instance, one participant wrote "are u a ai" *[sic]*. In subsequent trials, participants either continued to question the identity of their opponent, made irrelevant or random statements (e.g., "fgbhfghfvbhfbvbhvbfbvhbvhbbhb monkio," "Ketchup"), or simply pressed enter without providing an answer. There were, however, a subset of participants for which the deception appeared to have worked according to their messages. For such participants they either never questioned the true identity of their opponent or wrote statements relevant to the task at hand, such that they taunted the opponent or expressed frustration. For instance, one participant wrote, "Learn when to shut it" following a high provocation trial, while several participants noted "gg" for "good game" or commented on their win following a low provocation trial. Of note, participants were seated across the table from

the examiner for the duration of the task; however, their responses were not directly observed. Given inconsistency in participant buy-in and responding to the task, scores produced as a result of the task should not be considered valid. Correlation results support this conclusion, as neither task-assess reactive aggression nor task-assessed proactive aggression were significantly correlated with any parent, child, or teacher-reported measure of reactive or proactive aggression. Thus, while administered, data from this task was excluded from all analyses.

Post-Hoc Power and Sensitivity Analyses

Due to the reduction in sample size as a result of the present COVID-19 pandemic, post-hoc power analyses and sensitivity analyses were conducted using G*Power (Faul et al., 2007) to determine the power achieved and effect size required in order to detect effects, respectively.

For the analyses utilizing parent and child data, the sample size was set to $n = 27$. For analyses utilizing teacher data, the sample size was set to $n = 21$. For correlations conducted as part of data reduction using parent and child data, effect sizes were set in accordance with Cohen (1992): small ($p = .1$), medium ($p = .3$), and large ($p = .5$). Post-hoc power analyses indicate the statistical power for this study was $1-\beta = .08$ to detect a small effect, $1-\beta = .34$ to detect a medium effect, and $1-\beta = .78$ to detect a large effect. Further, post-hoc sensitivity analyses utilizing sample size ($n = 27$), significance level ($\alpha = .05$) and power ($1-\beta = .8$) were conducted. Results indicate the effect sizes that these analyses were powered to detect in the present sample were medium to large ($p = .43$). For correlations conducted utilizing teacher data, the sample size was set to $n = 21$ and all other parameters were held constant. Post-hoc power analyses indicate the statistical

power for this study was 1-β = .07 to detect a small effect, 1-β = .27 to detect a medium effect, and 1-β = .67 to detect a large effect. Post-hoc sensitivity analyses indicated the effect sizes that these analyses were powered to detect in the present sample were large (p = .56).

Power and sensitivity analyses were conducted for the revised hypotheses of aim 1. For each model, two parameters were proposed (i.e., emotion dysregulation and negative urgency). Further, in accordance with Cohen (1988) effect sizes were set as follows: small (.02), medium (f^2 = .15), and large (f^2 = .35). The post hoc power analysis revealed the statistical power for analyses utilizing parent data was 1 - β = .11 for detecting a small effect size (f^2 = .02), 1 - β = .48 for detecting a medium effect size (f^2 = .15), and 1 - β = .83 for detecting a large effect size (f^2 = .35). Further, post hoc sensitivity analysis indicated the effect size that these analyses were powered to detect (f^2= .24) was moderate to large. For analyses assessing teacher data, post hoc power analysis revealed the statistical power was 1 - β = .10 for detecting a small effect size (f^2 = .02), 1 - β = .39 for detecting a medium effect size (f^2 = .15), and 1 - β = .73 for detecting a large effect size (f^2 = .35). Further, post hoc sensitivity analysis indicated the effect size that these analyses were powered to detect (f^2 = .41) was large.

For post-hoc power and sensitive analysis for hypotheses of aim two, the two-tailed alpha level was set to $p < .05$. Further, in accordance with Cohen (1988) effect sizes were set as follows: small (f^2 = .02), medium (f^2 = .15), and large (f^2 = .35). The sample size was set to n = 26 for models utilizing parent data, while the sample size for models utilizing teacher data was set to n = 21. In each model, a maximum of 7 parameters were proposed: one main effect in the first step (i.e., outcome expectancy bias

score), three possible main effects in the second step (i.e., parental involvement, positive parenting, inconsistent discipline), and three possible interaction terms in the third step (i.e., parental involvement x outcome expectancy bias, positive parenting x outcome expectancy bias, inconsistent discipline x outcome expectancy bias).

Finally, the two-tailed alpha level was set to $p \leq .05$ for post-hoc power and sensitivity analyses for the hypotheses of aim 3. In accordance with Cohen (1988), effect sizes were set as follows: small ($f^2 = .02$), medium ($f^2 = .15$), and large ($f^2 = .35$). Post hoc power analyses indicate the statistical power for this study was $1-\beta = .09$ to detect a small effect size ($f^2 = .02$), $1-\beta = .39$ to detect a medium effect size ($f^2 = .15$), and $1-\beta = .72$ to detect a large effect size ($f^2 = .35$). Post hoc sensitivity analysis indicates the effect sizes detectable was large ($f^2 = .33$).

CHAPTER III

RESULTS

Preliminary Analytical Procedures

The data were evaluated for outliers and normality. One variable was bimodal: parent-reported reactive aggression on the ABS. No significant outliers as were observed for any of the independent or dependent variables of the present study. Cases were considered outliers if they were three standard deviations or greater above the mean. The data were examined for skewness of each variable with the SPSS skewness statistic, with -1 (significant negative skew) and +1 (significant positive skew) as criteria (Howell, 2013). Two variables were significantly skewed: child-reported proactive aggression on the RPAQ (skewness statistic = 1.66), and parent-reported positive parenting on the APS (skewness statistic = -1.25). Each variable was natural log transformed. Subsequently, skewness statistics for log-transformed child-reported proactive aggression on the RPAQ (skewness statistic = .36) was within normal limits, while log-transformed parent-reported positive parenting on the APS became further skewed (skewness statistic = -1.80).

Aim 1

To assess aim 1, examining emotional and impulsivity factors contributing to reactive aggression, the following analyses were conducted:

Correlations and Data Reduction

Bivariate correlations were conducted for measures where parallel parent- and child-reports are available. Such variables included indices of emotion dysregulation (i.e., parent-report ERC and child-report ERICA), aggression (i.e., parent and child-report proactive and reactive aggression scales), and negative urgency (i.e., parent and child-report UPPS-P Impulsive Behavior Scale). Significant correlations arose between parent- and child-reported reactive aggression ($r = .43$ $p = .03$). This fell within the a-priori criteria set for compositing parent and child parallel variables, ($r \geq .3$, $p \leq .05$; Howell, 2013, p. 281; Nolan & Heinzen, 2017, p. 412). Thus, the data was composited by averaging parent and child responses and used in all further analyses, which research suggests may improve data reliability (Belsky et al., 1997). No further parallel parent- and child- report measures emerged as significant ($r \geq .3$, $p \leq .05$; Howell, 2013, p. 281; Nolan & Heinzen, 2017, p. 412). In analyses utilizing parent and child data, parent-reported emotion dysregulation was utilized, given the greater use and validation of the Emotion Regulation Checklist in the literature. Child-reported negative urgency was utilized in order to reduce the influence of common method variance on the results. Teacher measures were assessed separately, as research indicates that teachers provide a unique perspective on children's emotional and behavioral functioning outside of the home (Kolko & Kazdin, 1993; Ferdinand et al., 2007). Thus, no correlations between teacher-report variables and parallel parent- and child- report variables were reviewed for data reduction purposes. Correlations among independent and dependent variables were examined to further refine analyses (table 3). Results indicate that parent-reported emotion regulation was significantly and positively associated with composited reactive

aggression (r = .58, $p \leq .001$), but not teacher-reported (r = .07, p = .78) or task-assessed (r =.16, p = .43) reactive aggression. Further, child-reported negative urgency was significantly and positively associated with composited reactive aggression (r = .43, p = .02) but not teacher-reported (r = .43 p = .06) or task assessed (r = .21, p = .31) reactive aggression. As task-assessed reactive aggression was not significantly correlated with any of the independent variables of interest for this aim, the data was excluded from data analysis.

To determine covariates in the analyses, correlations were run between variables of interest and demographic data (e.g., age, pubertal development). Results can be found on table 4. For hypothesis 1, pubertal development was negatively correlated with parent-reported negative urgency (r = -.43, p = .03), indicating that children further in pubertal development exhibited less impulsivity in the context of strong negative emotions. Neither pubertal development, age, or sex were significantly correlated with any other parent- or child- report measures or task data associated with hypothesis 1 (i.e., emotion dysregulation, aggression). Additionally, pubertal development was significantly positively correlated with teacher-reported emotion dysregulation (r = .46, p = .02), but not teacher-reported reactive aggression. As these variables were not correlated with the dependent variables, they were not included as covariates in analyses.

Data Analytic Plan

To address the hypotheses of aim 1, the following analyses were conducted using SPSS 25.

1) A multiple regression was conducted to examine parent-reported emotion dysregulation and child-reported negative urgency in the estimation composited reactive aggression.
2) A simple linear regression was conducted to examine parent-reported emotion dysregulation in the estimation of parent-reported proactive aggression.
3) A multiple regression was conducted to examine teacher-reported emotion dysregulation and child-reported negative urgency in the estimation teacher-reported reactive aggression
4) A simple linear regression was conducted to examine teacher-reported proactive aggression in the estimation of teacher-reported proactive aggression.

Aim 1 Results: Parent data

One multiple linear regression was conducted to assess the effect of parent-reported emotion dysregulation and child-reported negative urgency in the estimation of composited reactive aggression (hypothesis 1a). Results can be found on table 5. No potential covariates were significantly correlated with composited reactive aggression in bivariate analyses; therefore, no covariates were entered into the model**.** Composited reactive aggression was concurrently regressed onto parent-reported emotion dysregulation and child-reported emotion dysregulation. Results indicate that the model was statistically significant, (F (2,24) = 9.53, $p \leq .001$, $R^2 = .44$). Further examination of variables entered into the model indicate that both emotion dysregulation ($\beta = .21$, $t = 3.31$, $p = .003$) and negative urgency ($\beta = .33$, $t = 2.08$, $p = .05$) significantly and positively estimated composited reactive aggression. That is, greater emotion

dysregulation and greater negative urgency are both associated with greater reactive aggression in the present sample. The effect size of the present results (f^2 = .78) fell well above the effect size detectable in post-hoc analyses. Thus, the present results are considered interpretable.

To address hypothesis 1b, one simple linear regression was conducted. Parent-reported proactive aggression was regressed onto parent-reported emotion dysregulation. As hypothesized, results indicated emotion dysregulation did not significantly estimate proactive aggression as reported by parents (β = .003, $t(28)$ = .56, p = .58).

Aim 1 Results: Estimation of teacher-reported reactive aggression

One multiple linear regression was conducted to assess the effect of teacher-reported emotion dysregulation and child-reported negative urgency in the estimation of teacher-reported reactive aggression (hypothesis 1a). Results can be found on table 6. No potential covariates were significantly correlated with teacher-reported reactive aggression in bivariate analyses; therefore, no covariates were entered into the model (table 4)**.** Teacher-reported reactive aggression was regressed onto teacher-reported emotion dysregulation and child-reported negative urgency. Results indicated that the model was statistically significant, (F (2,17) = 5.63, p = .01, R^2 = .39). Further examination of variables entered into the model indicate that emotion dysregulation (β = .58, t = 2.48, p = .02) significantly and positively estimated reactive aggression, while negative urgency (β = .08, t = .35, p = .73) did not significantly estimate reactive aggression. That is, greater emotion dysregulation, but not negative urgency, is associated with greater reactive aggression in the present sample. The effect size of the present

results (f^2 = .64) fell well above the effect size detectable in post-hoc analyses. Thus, the present results are considered interpretable.

To address hypothesis 1b, that emotion dysregulation would not be significantly associated with proactive aggression, one simple linear regression was conducted. As hypothesized, results indicated child-reported emotion dysregulation did not significantly estimate teacher-reported proactive aggression (b = .003, $t(28)$ = .56, p = .58).

Aim 2

Correlation and Data Reductions

Bivariate correlations were conducted to determine the variables inputted into analyses. Parallel parent and child-reported proactive aggression were not significantly correlated (r = .21, p = .29). Therefore, parent-report measures of proactive aggression were utilized, as parents are considered reliable reporters of aggression given the observable nature of externalizing behaviors (de Los Reyes et al., 2015). Bivariate correlations between independent variables with parent, teacher, and task-assessed proactive aggression were conducted (table 7). Inconsistent discipline was significantly correlated with parent-reported proactive aggression (r = .52, $p \leq .01$). The correlation between positive parenting and parent-reported proactive aggression was near significant (r = .34, p = .07). This insignificance may be due to the study's power to only detect large effects, and thus positive parenting was included alongside inconsistent discipline as potential moderators. Interestingly, correlations between the outcome expectancy bias and proactive aggression were insignificant for both parent (r = .11, $p > .05$) and teacher (r = .21, $p > .05$) reports, although this may be due to the lack of power to detect small to moderate effects. Further, task-assessed proactive aggression was not associated with the

outcome expectancy bias score ($r = 10$, $p > .05$), or any parenting variables ($p > .05$). Given concerns regarding the lack of relationships, as well as concerns regarding the participant's buy-in to the task, no analyses were conducted utilizing the task data. Finally, pubertal development, sex, and age were not significantly correlated with the dependent variable of hypothesis 2 (table 8). Thus, no covariates were included in the analyses of hypothesis two.

Data Analytic Plan

To address aim 2, and the associated hypotheses that parenting factors moderate the relation between the outcome expectancy bias and proactive aggression, the following analyses were conducted:

1) A linear hierarchical regression in which parent-reported proactive aggression was regressed onto outcome expectancy bias, inconsistent discipline, and positive parenting. Outcome expectancy bias score was entered into step one of the model to assess the unique effect of outcome expectancy bias on proactive aggression. APS-measured inconsistent discipline and positive parenting were entered into step 2 to assess the impact of parental behavior on proactive aggression. Finally, two interaction terms (outcome expectancy bias by inconsistent discipline and outcome expectancy bias by positive parenting) were entered into step 3 of the model to assess the interaction between biased outcome expectancy and parenting behavior in the estimation of proactive aggression when reported by parents.

2) Linear hierarchical regression in which teacher-reported proactive aggression was regressed onto biased outcome expectancy, inconsistent discipline, and positive parenting. The outcome expectancy bias score was entered into step one of the model to

assess its unique impact on proactive aggression. APS-measured inconsistent discipline and positive parenting were entered into step 2 to assess the impact of parental behavior on proactive aggression. Finally, two interaction terms (outcome expectancy bias by inconsistent discipline and outcome expectancy bias by positive parenting) were entered into step 3 of the model to assess the interaction between outcome expectancy bias and parenting in the estimation of proactive aggression as reported by teachers.

Aim 2 Results: Estimation of Parent-Report Proactive Aggression

To assess hypothesis 2, one hierarchical regression analysis was conducted utilizing parent- and child- reports to assess the direction and strength of the relationship between outcome expectancy bias, parenting practices, and proactive aggression (table 9). Age, sex, and pubertal status were not significantly correlated with the dependent variable, proactive aggression, therefore no covariates were entered into the model. outcome expectancy bias was entered into the first step of the model. Results of step one indicated outcome expectancy bias did not estimate, or significantly contribute to, proactive aggression ($R^2 = .01$, $\beta = .11$, $p = .60$). Examination of step two of the overall indicated that the introduction of parenting practices significantly improved model fit ($R^2 = .38$, $\Delta R^2 = .37$, $p = .007$). Specifically, examination of the variables entered into step 2 indicated that inconsistent discipline ($\beta = .50$, $p \leq .01$) but not positive parenting ($\beta = .26$, $p > .05$) significant contributed to parent-reported proactive aggression. That is, children who experienced more inconsistency in the application of discipline engaged in greater proactive aggression. Finally, results of step three indicated that the inclusion of moderation terms did not significantly improve model fit ($R^2 = .47$, $\Delta R2 = .08$, $p = .25$). Examination of the variables entered into step three indicated no significant interactions

occurred between outcome expectancy bias and inconsistent discipline (β = .91, p = .22) or positive parenting (β = -1.41, p = .12) in the estimation of proactive aggression.

Aim 2 Results: Estimation of Teacher-Report Proactive Aggression

One hierarchical regression analysis was conducted to assess the strength of the relationship between outcome expectancy bias, parenting practices, and proactive aggression as reported by teachers (table 10). Age, sex, and pubertal status were not significantly correlated with the dependent variable, proactive aggression, therefore no covariates were entered into the model. The outcome expectancy bias score was entered into the first step of the model. Results of step one indicated outcome expectancy bias did not estimate, or significantly contribute to, teacher-reported proactive aggression (R^2 = .04, β = .21, p >.05). Step two demonstrated that the introduction of parenting practices did not significantly improve model fit (R^2 = .25, ΔR^2 = .20, p = .19). Indeed, further examination of variables in step 2 indicated that neither inconsistent discipline (β = -.56, p = .07) nor positive parenting (β = -.08, p = .76) significant contributed to the estimation of teacher-reported proactive aggression. Finally, results of step three indicated that the inclusion of moderation terms did not significantly improve model fit (R^2 = .38, ΔR2 = .14, p = .30). Examination of the variables entered in step three indicated no significant interactions occurred of between outcome expectancy bias and inconsistent discipline (β = 1.01, p = .38) or positive parenting (β = -1.65, p = .15) in the estimation of proactive aggression.

Aim 3

Correlation and Data Reductions

As previously noted, parent-reported and child-reported reactive aggression were significantly and positively correlated (r = .43 p = .03); thus, the two reports were averaged to create a composite reactive aggression score, which was then utilized for the present analyses. Correlations for indices of emotion dysregulation (i.e., parent-report ERC and child-report ERICA) and negative urgency (i.e., parent and child-report UPPS-P Impulsive Behavior Scale) were insignificant. As previously discussed, child-reported negative urgency and parent-reported emotion dysregulation were utilized in analyses utilizing parent and child data. Teacher measures were assessed separately in order to provide unique information regarding children's behaviors at home and school. No measure of teacher-reported negative urgency was collected; thus, child-reported negative urgency was selected for analyses utilizing teacher-report measures. Child-reported urgency, as opposed to parent-report urgency, was selected to better reflect children's actions in the classroom setting where parents are not direct observers.

Data Analytic Plan

To address the hypotheses of aim 3, which hypothesizes that emotion dysregulation would have an indirect effect on reactive aggression through negative urgency, two indirect effects models were specified using Model 4 of the PROCESS macro for SPSS 25 (Hayes, 2012).

1) The effect of child-reported emotion dysregulation on composite reactive aggression directly and indirectly through parent-reported negative urgency (Figure 1).

2) The effect of teacher-reported emotion dysregulation on teacher-reported reactive aggression directly and indirectly through child-reported negative urgency (Figure 2).

Of note, given the small sample size due to the premature termination of the study, the present analyses are not sufficiently powered to detect significant effects. Accordingly, they are presented as exploratory analyses for demonstration purposes.

Aim 3 Results: Exploratory Parent and Child Report Reactive Aggression

The first model (Figure 1) examined the effects of parent-reported emotion dysregulation on composite reactive aggression directly and indirectly through child-reported negative urgency. No demographic variables were associated with composite reactive aggression (table 4); therefore, no covariates were specified in the model. In accordance with hypothesis 3a, direct effects were examined to address the effect of emotion dysregulation on reactive aggression. Results indicated parent-reported emotion dysregulation directly estimated composited reactive aggression (c path; $\beta = .58$, $t(25) = 3.60$, $p \leq .001$). That is, greater emotion dysregulation was associated with greater reactive aggression. To address hypothesis 1b, direct effects were examined to assess the effect of parent-reported emotion dysregulation on child-reported negative urgency. Results indicated that parent-reported emotion dysregulation did not significantly estimate child-report negative urgency (a path, $\beta = .21$, $t(25) = 1.08$, $p = .29$). To address hypothesis 1c, direct effects were examined to assess the effect of negative urgency on reactive aggression. Results indicated child-reported negative urgency significantly and positively estimated composited reactive aggression (b path, $\beta = .33$, $t(24) = 2.08$ $p \leq .05$). That is, greater negative urgency estimated greater reactive aggression. Given the

lack of direct effects between negative urgency and reactive aggression (a path), no indirect effects were possible (hypothesis 1d). This was confirmed by examination of the effect of emotion dysregulation on reactive aggression after negative urgency was introduced into the model. Results indicated that the relationship between emotion dysregulation and reactive aggression remained significant (c' path; β =.52, t (24) = 3.31, p = .003) when negative urgency was entered into the model. The bias-corrected bootstrap confidence interval for the indirect effect based on 5,000 bootstrap samples included zero (-.03, 1.31). Thus, no significant partial or full indirect effects were observed.

Aim 3 Results: Exploratory Teacher Report Reactive Aggression

The second and final model of aim 3 (Figure 2) examined the effects of teacher-reported emotion dysregulation on teacher-reported reactive aggression directly and indirectly through child-reported negative urgency. No demographic variables were associated with teacher-rated reactive aggression; therefore, no covariates were specified in the model. In accordance with hypothesis 1a, direct effects were examined to address the effect of emotion dysregulation on reactive aggression. Results indicate teacher-reported emotion dysregulation significantly estimated teacher-reported reactive aggression (c path; β = .63, t(18) = 3.42, p = .003) such that children with greater emotion dysregulation demonstrated greater reactive aggression at school. To address hypothesis 1b, direct effects were examined to assess the effect of teacher-reported emotion dysregulation on child-reported negative urgency. Results indicated that teacher-reported emotion dysregulation significantly estimated child-report negative urgency (a path, β = .59, t(18) = 3.11, p = .006) such that greater emotion dysregulation was associated with

greater negative urgency. To address hypothesis 1c, direct effects were examined to assess the effect of negative urgency on reactive aggression. Results indicated that child-reported negative urgency did not significantly estimate teacher-reported reactive aggression (b path, $\beta = .08$, $t(17) = .35$, $p = .73$). As no direct effect of negative urgency on reactive aggression was observed, no indirect effects (hypothesis 1d) in the model were possible. This was confirmed by examination of the effect of emotion dysregulation on reactive aggression after negative urgency was introduced into the model. Results indicated that the relationship between emotion dysregulation and reactive aggression remained significant (c' path; $\beta = .58$, $t(17) = 2.48$, $p = .02$), such that emotion dysregulation significantly estimated reactive aggression both on its own and when negative urgency is accounted for in the model. Further, the bias-corrected bootstrap confidence interval for the indirect effect based on 5,000 bootstrap samples included zero (-.70, .88). Thus, no significant indirect effects were observed. Of note, the present analysis was significantly under-powered to detect small or medium effects. Thus, the lack of significance for the indirect effect may not be reflective of the true nature of the relationship.

CHAPTER IV

DISCUSSION

The current study provides an initial examination of a novel diverging model of reactive and proactive aggression among children with ADHD. This study serves as the first attempt to integrate several contributing factors to aggressive behavior, including emotion regulation, impulsivity, social information processing, and parenting. Specifically, the present study aimed to understand the roles of emotion dysregulation and negative urgency in reactive aggression and the roles of social information processing and parenting in proactive aggression. To this end, the present study hypothesized that 1) both negative urgency and emotion dysregulation would significantly estimate reactive aggression, 2) parenting variables would significantly moderate the relation between social information processing biases and proactive aggression, and 3) a significant indirect effect between emotion dysregulation and reactive aggression through negative urgency would be observed. Given the small sample size and limited power of the present study due to the COVID-19 pandemic, the third hypothesis was proposed as a demonstration of competency. Thus, while the results were reported, they should be interpreted with extreme caution. By utilizing both parent and teacher report of behavior, the present study was able to assess the contributing factors to children's behavior across settings and contexts.

The present results did not support the study hypotheses in their entirety. Consistent with hypothesis 1, results indicate that both emotion dysregulation and reactive aggression significantly estimate reactive aggression as reported by parents. However, results indicate that *only* emotion dysregulation, *not* negative urgency significantly estimates reactive aggression when reported by teachers with a large enough effect to be detectable in a small sample. This suggests emotion dysregulation is a robust indicator of reactive aggression across contexts. Conversely, the results *may* indicate that impulsivity in the context of strong negative emotions is only associated with reactive aggression when reported by parents.

Further, results were inconsistent with hypotheses 2a – 2c such that the outcome expectancy bias within social information processing does not significantly estimate proactive aggression and parenting practices do not emerge as moderators. Further, inconsistent parenting, but not positive parenting, significantly estimated proactive aggression in the present study. Thus, while erratic use of negative consequences or use of threats is associated with greater proactive aggression, neither supportive nor positive parenting practices are associated with changes in proactive aggression when reported by parents. Finally, no variables appear to be associated with proactive aggression when reported by teachers. However, insignificant results are considered uninterpretable due to low power. That is, the insignificant results *may* or *may not* be representative of the true phenomenon, which further research is required to determine.

Finally, given the small sample size that resulted from the premature ending to data collection, hypothesis 3 could not be accurately tested due to substantial underpowering of analyses. Indirect effect analyses were run as a demonstration of how

this hypothesis would have been tested had data from a larger sample been able obtained as proposed. Thus, results are not considered reflective of the validity of this hypothesis. That is, while the present results did not indicate significant indirect effects of emotion dysregulation on reactive aggression through negative urgency, regardless of the reporter, these results cannot be meaningfully interpreted. However, several significant findings did emerge that were consistent with the results of hypothesis 1. Specifically, direct effects of emotion dysregulation on reactive aggression reported by both parents and teachers were observed, and direct effects of negative urgency on reactive aggression reported by parents was observed. Further, direct effects emotion dysregulation on negative urgency was observed, although only when emotion dysregulation was reported by parents. These findings, as well as their theoretical and clinical implications, are explored below.

Reactive Aggression

The present study illustrates the deleterious effects of emotion dysregulation on children with ADHD (Faraone et al., 2019; Shaw et al., 2016). Indeed, the present results indicated that emotion dysregulation significantly and positively estimates concurrent reactive aggression. This finding is robust, such that it was observed when examining both parent and child questionnaire data as well as teacher questionnaire data. Thus, it appears that those with greater emotion dysregulation are more likely to engage in reactive aggression regardless of the setting and its associated contributing environmental factors.

Reactive aggression by definition is considered ‘hot-blooded’ or emotional, as it occurs in the context of provocation that may result in frustration or anger (Stoppelbein &

Greening, 2009). In order to reduce or discontinue the aversive event and reduce feelings of frustration or anger, individuals engage in aggressive behavior. The present results indicate that emotion dysregulation is the process by which negative affects builds following aversive events or stimuli, which then acts as the trigger for aggressive behavior. When presented with a challenge or provocation, children with poor emotion regulation skills fail to utilize skills in order to prevent distress. That is, they either ineffectively use or fail to engage in skills such as relaxation, removing themselves from the situation, problem solving, redirecting attention, or changing their way of thinking about the situation. This failure results in the initial negative affect or distress escalating without any available adaptive methods for coping, thusly resulting in aggression. In other words, reactive aggression appears to be the behavioral result of an individual's poor ability to attenuate growing distress.

This finding is consistent with prior literature which indicates emotion dysregulation is associated with both aggression generally (Donahue et al., 2014) and reactive aggression specifically (Calvete & Orue, 2012; Donahue et al., 2014; Skripkauskite et al., 2015; Zhang & Gao, 2015). However, while the link between emotion dysregulation and reactive aggression has been well established in the literature, the preponderance of the research has been conducted among individuals without ADHD (Shields & Cicchetti, 1998; Skripkauskaite et al., 2015Orobio De Castro et al., 2005). Thus, the present study serves as the first study into the role of global emotion dysregulation in reactive aggression among children with ADHD. This consistency in results among those with and without ADHD may indicate that a similar process may be occurring among children with ADHD as those without. That is, the greater rates of

reactive aggression may be due, in part, to greater rates of emotion dysregulation within the population. Indeed, between 25% and 50% of children with ADHD exhibit significant emotion dysregulation (Becker et al., 2006; Shaw et al., 2016; Spencer at al., 2011), which by some estimates is approximately 10 times greater than the general population (Stringaris & Goodman, 2009). Therefore, in light of present results, it is unsurprising that children with ADHD exhibit more reactive aggression than their peers.

A plethora of research has indicated the children with ADHD exhibit greater reactive aggression than their peers (Bennett et al., 2004). However, the preponderance of research has focused on demographic factors (e.g., sex, age; Connor et al., 2003; Murray et al., 2020), the role of individual ADHD symptoms (Bennett et al., 2004; Connor et al., 2010), medication effects (King et al., 2009), and comorbidity (Waschbusch et al., 1998). A general paucity of research has been conducted to explain why increased rates of reactive aggression occurs. As such, no consensus has been reached as to why children with ADHD engage in greater reactive aggression than their peers. Such information is critical given the substantial long- and short-term impairment associated with reactive aggression. The available research has examined components of emotion dysregulation such as emotional lability (Slaughter et al., 2019) and poor emotional awareness (Factor et al., 2016); however, no research has focused on overall emotion dysregulation within this population. The present study indicates that overall emotion dysregulation, not just individual components, significantly contributes to aggressive behavior among children with ADHD. Given the multidimensional and heterogenous nature of emotion regulation, future research should aim to *compare* and *combine* different components

(i.e., irritability, lability, emotional awareness, etc.) to further understand which significantly contribute to the development of reactive aggression within ADHD.

In contrast to findings on emotion dysregulation, results of the present study provide inconsistent information regarding the role of negative urgency in reactive aggression among children with ADHD. Specifically, results of the multiple regression analyses indicate that negative urgency is *only* associated with reactive aggression when utilizing parent and child data. That is, children with ADHD who tend to act impulsively in the context of strong negative emotions engage in greater reactive aggression when assessing parent- and child- reports. As such, when children experience frustration or distress as a result of the provocation, those with greater tendency to act impulsively in order to reduce negative affect are more likely to engage in aggression. This is consistent with extant research which finds that negative urgency significantly and positively estimates aggression in general (Berg et al., 2015; Zapolski et al., 2010) as well as reactive aggression specifically (Hecht & Latzman et al., 2015; Miller et al., 2003).

Of note, negative urgency did *not* significantly estimate reactive aggression when reported by teachers. There are several possible explanations for this discrepancy. First and foremost, given the small sample size ($n = 21$) for this analysis, the analyses may have been underpowered to detect small to medium effects. Thus, the present relation may exist but is unable to be detected in the present analysis. Alternatively, the present results may be indicative of differential behavior in and out of school. Indeed, prior literature suggests that parents and teachers often provide discrepant reports that are reflective of differences in children's behavior in different contexts (Kolko & Kazdin, 1993). This may be due to differences in environmental influences, such as the types of

rules or behavior management systems used in school versus at home. Such environmental constraints may reduce reactive aggression by reducing the number and intensity of triggering events. That is, behavior management systems may prevent children high in negative urgency from experiencing events that may result in negative affect, thus preventing impulsive action. For instance, a classroom with well-enforced rules and consequences surrounding respectful language may be less triggering for a child who experiences distress from yelling or negative language. Alternatively, the rules and consequences themselves may prevent individuals from acting on their impulses.

Interestingly, no prior research has examined the relation between negative urgency and reactive aggression utilizing teacher reports, regardless of age or ADHD status. Rather, all research has focused on parent- and child- reports of behavior. Thus, no body of research is available to directly compare or contrast the present findings. Given the small sample size of the present study, future research should reassess the potential role of negative urgency on reactive aggression among children with and without ADHD. Further, in order to further provide evidence as to the nature of discrepancies between parent and teacher reports, future research should aim to compare parent and teacher's reports of reactive aggression with observational data.

All together, these findings have important implications for ongoing research on aggression among children with ADHD. Prior literature has only assessed the role of emotion dysregulation and negative urgency *separately* in reactive aggression (Donahue et al., 2014; Calvete & Orue, 2012; Hecht & Latzman, 2015; Miller et al., 2003). Indeed, research has demonstrated that each independently contributes to instances of reactive aggression, but it was largely unknown if and how the two concurrently relate to reactive

aggression. The present study provides initial evidence suggesting that emotion dysregulation and negative urgency both *independently* and *collectively* contribute to reactive aggression. The definition of reactive aggression implicates provocation as the reason why aggression occurs; the present findings implicates emotion dysregulation as part of the provocation and impulsivity as a way in which such provocation results in aggression. That is, the present results suggest that among children with ADHD, those with high emotion dysregulation become significantly distressed in the face of a challenge or opposition. In those high in negative urgency, this distress is difficult to tolerate, thus resulting in children making poor decisions to aid in coping. In this way, the present findings provide a glimpse into *why* provocation results in aggression. Of note, the present study solely utilized concurrent questionnaire data. While the direction of the relationships can be inferred from the literature, the results cannot definitively indicate direction. That is, the present results *could* indicate that reactive aggression results in greater levels of emotion dysregulation and negative urgency or that a cyclic relationship exists. In order to better understand the directionality of the present relationships, future research should reassess this relationship utilizing longitudinal data. Alternatively, experimental methods may be utilized, although it would answer a somewhat different question and may not be able to address negative urgency. For instance, research may assess if coaching emotion regulation skills mitigates the tendency to engage in reactive aggression.

As previously noted, meaningful results cannot be drawn from the analyses associated with aim 3 given the low sample size and lack of power. Thus, implications from these results cannot be adequately explored. That is, while an indirect effect of

emotion regulation on reactive aggression through negative urgency was not observed, it is unable to be determined if the relationship is truly insignificant. Therefore, future research should repeat the present indirect effect analyses in order to determine the true role of emotion dysregulation and negative urgency in reactive aggression utilizing a larger sample of children and adolescents with ADHD. Additionally, future research should aim to assess the role of negative urgency as a mediator utilizing longitudinal data in order to establish temporal precedence.

Proactive Aggression

Contrary to expectations, outcome expectancy bias was not associated with proactive aggression in the present sample. However, this finding is inconsistent with the extant literature, which implicates outcome expectancy biases in proactive aggression in both between-subject studies (i.e., comparing aggressive and non-aggressive groups; Crick & Dodge, 1996) and regression studies (i.e., Smithmeyer et al, 2000). That is, previous literature suggests children categorized as highly proactively aggressive expect more positive outcomes from aggressive behavior than their peers who categorized as minimally or low proactive aggression (Crick & Dodge, 1996). These expected rewards were both instrumental (access to desires goods or materials) and social (increased social status; Crick & Dodge, 1996) in nature. Not only does prior research indicate that children categorized as proactively aggressive demonstrate biased expectations regarding the outcome of their actions, but the outcome expectancy bias has emerged as a significant predictor of proactive aggression (Smithmeyer et al., 2000).

The explanation for these results and the discrepancy within the extant literature is not clear; however, several explanations are possible. The present analyses were

statistically limited in several ways. First, a floor effect was observed for the SIP task, such that children generated few aggressive or negative responses in the vignettes and therefore the overall number of biased outcome expectations were limited. Indeed, the modal number of aggressive responses was 0, with a range of 0 to 15 *total* aggressive responses across all 9 vignettes. In contrast, the modal number of total responses across 9 vignettes was 19 with a range of 12 to 41 responses, while the modal number of prosocial or neutral responses was 9 with a range of 5 to 23 responses. Thus, the present measure may have been limited in its ability to accurately capture the full range of outcome expectancies. Thus, while the present results *could* indicate that outcome expectancy bias is not associated with increased proactive aggression, it may also be an indicator of measurement error.

Indeed, the presence of this floor effect indicates potential concerns with the SIP vignettes, such that they may not be ecologically valid or an accurate measure of children's real-life behavior. That is, participant's responses may not represent their true ability to attend to and respond to social situations in real life. This is supported by evidence that children with ADHD who undergo social skills training often fail to generalize these skills to real-life situations (Antshel & Remer, 2013). That is, while children with ADHD may be able to learn social skills (e.g., assertiveness, problem solving/conflict resolution, effective communication) and verbalize them in controlled situations, they often fail to apply these in real situations with peers, teachers, or family members. Thus, children in the present study may have been taught, either formally or informally, appropriate responses in situations similar to those depicted in the vignettes but not engage in such prosocial response in their daily life.

Further, positive illusory biases may have substantially influenced children's responses. The positive illusory bias is a phenomenon in which children with ADHD often overestimate their skill or ability in several areas of functioning, including academic performance (Owens et al., 2007), social skills (Diener & Milich, 1997) and behavior (Hoza et al., 2013; Owens et al., 2007). This bias tends to be resistant to feedback, such that inflated self-assessments remain consistent even when given feedback or instruction otherwise (Hoza et al., 2012). It is theorized that this process develops as a self-protective mechanism, as opposed to the result of poor social competence or executive dysfunction, in order to cope with repeated negative experiences (McQuade et al., 2017; Ohan & Johnston 2002). Applied to the present study, participants may have overestimated their ability to engage in calm or prosocial responses following a potentially provoking event.

In addition to participant-level factors, the inconsistencies between the present findings and extant literature may be reflective of social and cultural changes associated with bullying policy. Much of the present research on social information processing and aggression was completed in the mid-1980s to early 2000's. In that time span, research has demonstrated the substantial deleterious short- and long-term impact of bullying and aggression on children and adolescents, resulting in the development of anti-bullying and anti-aggression programs (Bradshaw, 2015). While the efficacy of these programs in reducing aggression and bullying has been mixed (Ferrington & Ttofi, 2009; Ttofi & Ferrington, 2011), exposure to such programs may result in the development of social desirability bias in participant's responding. That is, it is plausible that such consistent messaging and programming may influence participants to respond in a prosocial or non-

aggressive manner when in the presence of an adult (e.g., the administrator), even if it is not reflected in their behavior outside of the research setting.

To address these concerns, future research should identify alternative methods of assessing social information processing. One such method emerging in the literature is the use of the SIP-AP (Kupersmidt et al., 2011), a web-based application in which participants are shown videos of ambiguous or provocative social situations and asked to rate responses on Likert-type scale, as opposed to in an open-ended method. Participants do not provide their answers directly to an adult when using the SIP-AP, and therefore may feel more comfortable endorsing the use of aggressive responses. In fact, research suggests that methods that provide participants with more privacy often result in more accurate responding (Larson, 2019). Alternatively, research utilizing traditional vignettes, as used in the present study, may focus on asking questions in a more "indirect" manner. Research suggests that using "indirect" questioning, as opposed to "direct" questioning, may reduce the impact of social desirability biases in research (Fisher, 1993; Larson, 2019). For this measure, indirect questioning could take the form of asking children to imagine that it is a friend in the social situation rather than themselves and asking questions about what their friend could do in that situation.

Unsurprisingly, given the psychometric concerns associated with the SIP task, no parenting variables emerged as moderators. However, inconsistent discipline was found to significantly estimate concurrent parent-reported proactive aggression. That is, children who experience greater inconsistency in the application of discipline engage in greater proactive aggression. This finding is considered robust, given the significance despite the low power of the analysis. Contrary to hypotheses, no other parenting

variables were significantly associated with proactive aggression in the present sample, although this may be due to low power as well as the inability to include several parenting indices due to poor reliability. Thus, no major conclusions can be drawn from the insignificant findings. However, the importance and meaning of the present significant finding is explored below.

The present results served to expand the current body of work exploring the role of parenting behavior in aggressive behavior among children with ADHD. Overall, the present findings are consistent with extant literature which implicates inconsistent discipline in proactive aggression (Brendgen et al., 2018; Pederson & Fite, 2014). In fact, Pederson and Fite (2014) completed a series of regressions which indicated that only inconsistent discipline significantly estimated proactive aggression while parental involvement and positive parenting did not. Further, research has found that consistently enforcing rules and applying discipline results in prosocial behavior and well-developed social skills (Maccoby, 1992). While the definition of proactive aggression implicates the individual's desire to receive a reward, the present results indicate that additional external parenting factors may be an important consideration for the way the behavior either begins or is maintained. That is, the behavior is *not* just the product of the children's cognitive biases, but of children's environment, learning history, and experiences.

Interestingly, no prior research has examined the role of parenting behaviors in proactive aggression among children with ADHD specifically, despite high rates of proactive aggression within the population and difficulties associated with parenting a child with ADHD. Specifically, parents of children with ADHD report greater rates of stress associated with parenting (Kazdin & Whitley, 2003), which in turn has been

associated with poorer use of positive parenting practices and greater use of negative or coercive parenting practices (Dix, 1991). As the present results are consistent with results found in a general sample, the findings suggest that children with ADHD's exaggerated rates of greater proactive aggression is due, in part, to the high rates of inconsistent discipline in this population.

The present results are consistent with intermittent reinforcement of behavioral theory. According to behavioral theory, intermittent reinforcement occurs when behaviors are rewarded on an inconsistent schedule, such that the behaviors sometimes result in a reward and sometimes do not. Behaviors, both desirable and undesirable, that are intermittently reinforced are often resilient to extinction, as individuals learn to expect that their behavior will result in the desired outcome at random times (Cooper et al., 2007). Applied to proactive aggression, individuals engage in an aggressive act in order to reach a goal *despite* being against the rules, and *sometimes* receive that reward, thereby learning that it may be worth engaging in again in the future. Thus, some engage in greater aggression in order to receive that reward in the future. Given the cross-sectional nature of the present data, it is unclear if inconsistent discipline *precedes* the development of proactive aggression, if it develops as a consequence of proactive aggression, or if it is part of a cycle maintaining the behavior. Indeed, it is unclear *why* some children engage in aggression initially. Future work should utilize longitudinal data in order to establish temporal precedence and assess additional contributing factors.

One potential contributing factor worth exploring, in conjunction with inconsistent discipline, may include reward and punishment sensitivity. Children with high reward sensitivity and low punishment sensitivity exhibit high rates of proactive

aggression (Drnas, 2020). That is, children who highly value potential rewards and disregard potential consequences are more likely to engage in proactive aggression in order to receive the potential reward. Further, research indicates that individuals with high reward sensitivity are less responsive to behavior change in light of inconsistent or harsh parenting (Le, 2020). Thus, children may engage in proactive aggression for a prolonged time even when the probability of a reward is low due to a high value placed on potential rewards and low value placed on the potential consequences. Further, children high in reward sensitivity value immediate rewards over long term consequences. That is, an individual may engage in proactive aggression as it *may* lead to a reward in the short-term despite potentially unfavorable long-term consequences. Children with ADHD exhibit higher rates of reward sensitivity than their typically developing peers (Luman et al., 2009) which has been tied to a plethora of negative behaviors (Drnas, 2020; Groen et al., 2013). Thus, reward sensitivity may provide more information as to why children with ADHD engage in proactive aggression initially despite explicit or implicit rules against it.

Consistent with Pederson & Fite (2014), no other parenting behaviors emerged as significant predictors of proactive aggression. This result should be interpreted with caution due to the low statistical power achieved by the present study. Indeed, post-hoc power analyses indicate the power of the present analysis was .36 for detecting a medium effect size. This was substantially lower than the proposed power of .80, and thus has a high likelihood of making a type II error if effects are small or medium. Further, several of the variables were excluded from the analysis due to poor reliability and others were significantly skewed and required transformations in order achieve normality. However,

this was not able to be achieved for positive parenting. The small sample size in the present study may contribute to the skewness in the present variables. Indeed, the distribution of samples increasingly approach normality as sample sizes increase (Howell, 2013). Thus, future research should reassess these results utilizing a larger sample size.

While meaningful implications cannot be taken from the null findings due to low power, it is possible to speculate that the present results may be indicative of a true phenomenon based on prior literature. Much of the prior research assessed the role of parenting behaviors with general aggression as opposed to proactive aggression. Indeed, research suggests that positive parenting and monitoring are inversely related to general aggression (Finkenauer et al., 2005, Mrug et al., 2008) while corporal punishment (Ohene et al., 2006; Slade & Winslow, 2004, Verhoeven et al, 2010) is associated with increased general aggression. Only parental involvement has shown no consistent association with general aggression (Yingling & Bell, 2016). Thus, the present findings may suggest that several of the parenting behaviors measured in the present study may be able to predict the occurrence of aggression overall, but not differentiate between the function or goal of aggressive behavior. To assess this, future research should compare relations between parenting behaviors and proactive aggression versus general aggression within an ADHD sample.

Teacher Ratings

As previously noted, many of the observed relations (negative urgency's estimation of reactive aggression, estimation of proactive aggression via inconsistent parenting) did not occur when utilizing teacher-reported aggression as the dependent

variable. In fact, no parenting behaviors were significantly correlated with teacher-reported proactive aggression. In the present study, only 70.97% of teachers returned measures, further reducing the power to detect significant findings. That is, the likelihood of a type II error is increased due to the small sample size. No prior research has assessed the relation between parenting behaviors and aggression at school as rated by teachers; therefore, it is unclear if the present findings are solely the result of the low power of the present study or if it is representative of a true phenomenon in which parenting behaviors are not associated with behavior observed and reported by teachers. Thus, the lack of significant results should be taken with caution.

Research has indicated that parent and teacher-reports are often discrepant when assessing ADHD symptoms (Swanson et al., 1999; Angtrop et al., 2002), internalizing symptoms, and externalizing symptoms (Youngstrom et al., 2000). Current consensus in the literature suggests this discrepancy is not the result of measurement error (Achenbach, 2011, De Los Reyes & Kazdin, 2013), but is representative of differences in perspective and situational demands (Angtrop et al., 2002; Takeda et al., 2020). That is, the demands placed upon children in classrooms often differ from those placed upon children at home, and thus children will engage in different behavior in order to meet such demands. Given the differences in demands, teachers and parents often have differing opinions on what behavior is appropriate or problematic (Tekada et al., 2020). Through this lens, the present lack of significant findings may indicate that parenting behavior has low to no influence on the presence or absence proactively aggressive behavior observed at school.

Clinical Implications

Aggressive behavior among children with ADHD remains a major area of psychosocial treatment as a result of the associated impairment in social, emotional, and academic domains. Results of the present study have substantial implications for the treatment of aggression in this population. First, the present study provides further evidence that children who experience greater emotion dysregulation and negative urgency exhibit increased reactive aggression. Prior research indicates that emotion dysregulation acts as a risk factor for functional impairment in general (Bodalski et al., 2019). More specifically, it is associated with increased social impairment and peer victimization (Biederman et al., 2012; Fogleman et al., 2019; Bunford et al., 2018), symptoms of internalizing disorders such as anxiety and depression (Biederman et al., 2012; Bodalski et al., 2019), and risk-taking behavior (Bunford et al., 2015). Left untreated, emotion dysregulation within ADHD is associated with long-term psychiatric comorbidities, including anxiety disorders and DBDs (Althoff et al., 2010) as well as poorer quality of life (Wehmeier et al., 2010). Further, negative urgency has been associated with substantial negative outcomes, including alcohol abuse (Malouff et al., 2007), illicit substance use (Kaiser et al., 2012), and risky sexual behaviors (Deckman & DeWall, 2011). Thus, routine assessment of emotion dysregulation and negative urgency is warranted given the present findings in concert with the far-reaching negative outcomes observed in the literature. That is, when children and families present for treatment of aggression, it is important that clinicians assess for the subtype of aggression that the child is exhibiting, as well as the presence and severity of emotion dysregulation and negative urgency. At the present, there are few measures of emotion dysregulation or

negative urgency that have been clinically normed for use in assessment and treatment. Rather, measures have been developed and utilized in research without definitive ranges for what is considered normative, sub-threshold, and clinically significant. Thus, ongoing research and development should be conducted to develop and norm measures in order to guide clinical decision making.

In addition to increased focus on assessment of emotion regulation and negative urgency in the treatment of aggression, the present studies has important implications for intervention as well. At the present, the gold standard of treatment for ADHD consistent of combination treatment with stimulant medication treatment and behavioral therapy (MTA Cooperative Group, 2004). Individuals receiving behavioral therapy exhibit improvement in global aggression (MTA Cooperative Group, 2004). Further, stimulant treatment (King et al., 2009) has demonstrated some efficacy in improving reactive aggression, although the long-term efficacy has not been established.

While effective at reducing ADHD symptoms and behavioral impairment immediately following treatment, the effect of behavioral therapy demonstrates poor longitudinal outcomes (Hechtman et al., 2016). That is, while children demonstrate substantial improvement immediately following termination of treatment, children who received behavioral treatment were indistinguishable from those who did not approximately two years following treatment (Swanson et al., 2017; Hechtman et al., 2016). Further, upwards of 44% of those in the MTA study that received treatment continued to experience clinically significant impairment associated with aggression at 14 months (Jensen et al., 2007). In accordance with the present findings, such a lack of longitudinal improvement may be the result of the treatment's failure to address the

underlying deficits of reactive aggression, including deficits in emotion regulation and negative urgency observed in the present study. Thus, in order to promote long-term improvement and buffer children from the negative outcomes associated with aggression, emotion dysregulation and negative urgency should be attended to in treatment. In terms of medication, prior research indicates stimulant therapy has efficacy for improving some elements of emotion regulation, such as emotion recognition (Williams et al., 2008), and irritability (Fernández de la Cruz et al., 2015). Unfortunately, the effect of pharmacotherapy on negative urgency has not been assessed to this point, although it is effective at improving general impulsivity (Faraone & Buitelaar, 2010). In terms of psychosocial therapy, several treatments are emerging in the literature that show promise for addressing underlying the processes associated with reactive aggression.

One potential treatment of promise includes the Managing Frustrations for Children Group (MFC; Rosen et al., 2019), a treatment designed to improve children's emotion regulation skills. Results of an open trial of MFC were favorable, such that children who completed treatment demonstrated clinically and statistically significant improvements in emotion dysregulation and externalizing difficulties (Rosen et al., 2019). Thus, MFC may be a viable group option for reducing aggressive behavior through the improvement of emotion regulation skills. A second emerging treatment is Collaborative and Proactive Solutions (née Collaborative Problem Solving, CPS; Greene et al., 2002). CPS treatment is form of CBT that focuses on remedying children's underlying skill deficits in communication, emotion regulation, working memory, and social skills by coaching children throughout the steps of problem solving when difficulties arise. In this way, children are provided the skills for better regulating their

behaviors during regular interactions with parents (Greene et al., 2003). This modality of treatment has demonstrated good evidence for the improvement of aggressive behavior among children with emotion dysregulation (Greene et al., 2004). In fact, research suggests that children who receive CPS model of treatment exhibit greater improvement in symptoms than those who receive parent management training (Greene et al., 2004). Thus, given the focus on providing skills and training for underlying, transdiagnostic difficulties such as emotion dysregulation, CPS treatment may serve as a viable option for individual treatment of children with reactive aggression. Unfortunately, the effect of such treatments on negative urgency has not been assessed and, to date, no treatments have been developed for negative urgency.

While CBT-based therapies such as MFC and CPS treatments may be indicated for reactive aggression, results from the present study in concert with prior literature indicate that this modality of treatment would not be the most appropriate for proactive aggression. In fact, research on CPS treatment has shown that the treatment is less effective among individuals with proactive aggression. Specifically, Wolff and colleagues (2008) found that the CPS treatment was most effective when there were low levels of proactive aggression. Consistent with the theoretical basis of proactive aggression, this may be due to the instrumental nature of proactive aggression, as the CPS model does not include contingency management and therefore does not render the actions ineffective (Vitiello & Stoff, 1997). Thus, despite findings that emotion dysregulation significantly estimates proactive aggression observed by teachers, it is unlikely that this phenomenon would significantly improve with CBT. Further, limited research has been conducted on the role of SIP in CBT treatment. Argitha and colleagues

(2019) conducted a six-week CBT therapy that included psychoeducation on CBT (1 session), automatic thoughts and cognitive restructuring (3 sessions), and problem solving for controlling behavior (2 sessions). They reported that the response evaluation stage of SIP, where the outcome expectancy bias occurs, is unlikely to be affected by CBT treatments. Indeed, the authors reported significant improvement in the encoding and interpretation stages of SIP, which research indicates is not associated with proactive aggression. Thus, previous literature suggests that CBT may be an ineffective treatment for proactive aggression even if the present results indicating that the outcome expectancy bias is not associated with proactive aggression are, in fact, due to measurement error alone (Argitha et al., 2019).

Results of the present study indicated that inconsistent application of discipline (i.e., poor contingency management) is significantly associated with proactive aggression; thus, treatment with a focus on contingency management and long-term consistency by parents in their application of contingency management is warranted. At present, behavioral parent management training (PMT) is the only treatment that focuses on parental control of contingencies. Prior research has found that PMT is effective at reducing overall aggressive behavior (Blader et al., 2013), such that individuals receiving PMT exhibit significant reduction in aggression. As noted above, the efficacy for PMT in creating lasting change is poor. This may be due to the difficulty of maintaining a system of rewards and consequences given the heightened demands and stressors placed on parents of children with ADHD behavioral difficulties (Thuele et al., 2013). Current research is being conducted on the efficacy of "booster" sessions for long-term maintenance of gains, which includes continued intermittent sessions following

termination of formal treatment (Eyberg et al., 1998) consistent with the Continuous Care Model (Perri et al., 1993). While research has not yet been conducted on the efficacy of including a school daily report card (DRC) as part of the behavior plan for children with proactive aggression specifically, research indicates that it is beneficial for aggression globally (Owens et al., 2012; Holdaway et al., 2020). Given that the DRC assists in facilitating parent-teacher communication and generalizing the contingencies developed during PMT to the classroom, it may improve treatment outcomes for proactive aggression due to improved consistency in application of discipline techniques. Given the observed importance of inconsistent discipline in proactive aggression, research and treatment should focus methods for promoting long-term use of contingency management.

Limitations

The current study presents novel evidence on the contributing factors associated with reactive and proactive aggression among children with ADHD. However, several limitations must be taken into considerations when interpreting the results and their implications for future research and treatment. First and foremost, the present study was substantially underpowered to detect significant relationships and interactions. The results of an a priori power analysis prior to the commencement of data collection estimated that approximately 54 participants were required in order to achieve the desired power .80. However, data collection for the present study was concluded early in March 2020 due to the ongoing COVID-19 pandemic. At the time of conclusion, data had been collected from 31 participants and only 28 of those participants met criteria for ADHD. Studies with limited power have a higher likelihood of a type II error, meaning that a null

result may occur when, in reality, a significant relationship exists. While several significant findings arose from the available data, conclusive statements regarding the roles of emotion dysregulation and negative urgency in reactive aggression or the interactive roles of SIP and parenting behaviors in proactive aggression cannot be made. That is, while significant results indicate robust findings and warrant exploring the implications, insignificant are inconclusive. Thus, future studies utilizing a larger sample size will be crucial in order to replicate and build upon current findings.

In addition to poor power, one major limitation of the present study was the use of cross-sectional data. The present study provides an initial view into the relationship between *concurrent* reactive aggression with emotion dysregulation and negative urgency as well as *concurrent* proactive aggression with SIP and parenting behavior, which are extremely useful for identifying future directions in research and planning for treatments. While theory and prior research may provide guidance as to the directional nature of the observed relationships, longitudinal data or studies using experimental methods are required to make definitive conclusions. For instance, developmental research suggests emotion dysregulation forms in response to early life experiences (Chaplin & Cole, 2005; Cicchetti & Toth, 1995; Shields & Cicchetti, 1998) before behavioral patterns such as aggression can form. Thus, the literature indicates that deficits in emotion regulation precedes reactive aggression and is involved in its formation. However, there is a much smaller pool of research examining the role of negative urgency and parenting behaviors in aggressive behavior and thus there is limited evidence to suggest a causal relationship. Given the paucity of prior literature, as well as the lack of research of these phenomena among children with ADHD specifically, no predictive or causal relationships can be

drawn. Future research should focus on the collection of longitudinal data, or data collected at several time points, in order establish temporal precedence and causal relationships.

The final major limitation of the present study is the unknown applicability of the present results due the impacts of the COVID-19 pandemic. Research indicates that the pandemic has negatively impacted children throughout the world. Indeed, approximately 83% of children and adolescents report that lockdown has resulted in declines in mental health (Lee et al., 2020) and corresponding increases in anxiety, depression, OCD, and substance use have been observed (Al Omari et al., 2020; Sarvey et al., 2021). The negative impacts of the pandemic appear to be magnified among children with ADHD (Pollak et al., 2021), as individuals with ADHD exhibit increased impairment across several areas of functioning. For instance, children with ADHD and their parents report difficulties coping with social isolation as well as difficulties with motivation and engagement in virtual academic instruction (Sibley et al., 2020). In fact, adolescents with reported greater difficult with virtual school instructions than their typically developing peers (Becker et al., 2020). Outside of school, children with ADHD endorse increased symptoms of anxiety and depression (Sciberras et al., 2021). Despite limited social engagement, the level of disruptive and aggressive behavior among children with ADHD appear to have remained consistent or somewhat increased (Shah et al., 2021). Indeed, up to 50% of children with ADHD reported worsening aggression following the onset of the pandemic (Melegari et al., 2021). In terms of treatment, children with ADHD and their families faced difficulties in access to assessment, therapy, and medication treatment (McGrath, 2020) despite increasing ADHD symptom severity (Shah et al., 2021; Zhang

et al., 2020) and decreasing feelings of well-being (Bobo et al., 2020). In addition to child-level changes, significant parent and family-level changes have been observed. Specifically, parents endorse an increase in yelling, verbal abuse, and physical punishment (Shah et al., 2021). Given the unprecedented nature of the pandemic, the long-term effects on behavior and emotionality among children with ADHD are unclear. However, the increase in negative affect, ADHD symptoms severity (including impulsivity) and aggressive behavior suggest that children with ADHD may experience long-term negative impacts to their social, emotional, and behavioral functioning. At this time, the utility of current findings for explaining such deficits in impairment post-pandemic is unclear. Ongoing research comparing this population pre- and post-pandemic may shed light on this issue.

Conclusions

The present study examined potential contributing factors to reactive and proactive aggression among children with ADHD. Results indicate emotion dysregulation and negative urgency appear to significantly estimate reactive aggression among children with ADHD. That is, children with ADHD that demonstrate an inability to engage in antecedent-focused or response-focused emotion regulations strategies may be more likely to engage in emotionally driven aggression. Similarly, children with ADHD that demonstrate the tendency to act impulsively in the presence of heighten emotion exhibited an increased tendency to engage in reactive aggression. Importantly, these factors appear to function both independently and in concert, as both the model overall and individual variables were statistically significant.

Results did not reveal a relationship between the SIP outcome expectancy bias and proactive aggression despite a wealth of historical research and theory supporting their relationship. However, these examination of the pattern of responding indicate that this may be due to measurement error and poor construct validity of the measure as opposed to a truly absent relationship. However, the present study did reveal a relationship between inconsistent application of discipline and proactive aggression, which is consistent with prior research and behavioral theory. Though the present study has several limitations and experienced several setbacks associated with the COVID-19 pandemic, it has important implications for the assessment and treatment of aggressive behavior among children with ADHD and provides a guide for future research in the area.

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Table 1

Demographic Characteristics of the Sample

Mean Age (SD)	10.75 (1.84)
Gender (M)	53%
Race/Ethnicity (%)	
Caucasian/White	20 (71.4%)
African American/Black	3 (10.7%)
Biracial	5 (17.9%)
Latino/Hispanic	0
Other	0
ADHD Presentation (%)	
Predominantly Inattentive	8 (28.6%)
Combined	20 (71.4%)

Note: $n = 28$

Table 2

Means and Standard Deviations for Variables of Interest

Variable	Mean	Standard Deviation
Child-Report Negative Urgency	2.68	.78
Parent-Report Negative Urgency	2.55	.76
Child-Report Emotion Dysregulation	41.29	10.55
Parent-Report Emotion Dysregulation	2.10	.62
Teacher-Report Emotion Dysregulation	2.01	.70
Child-Report Reactive Aggression	1	.46
Parent-Report Reactive Aggression	1.06	.46
Teacher-Report Reactive Aggression	2.25	1.40
Parenting Involvement	42.82	4.50
Positive Parenting	26.89	2.51
Inconsistent Discipline	14.21	3.85
Child-Report Proactive Aggression	.31	.25
Parent-Report Proactive Aggression	.35	.26
Teacher-Report Proactive Aggression	1.33	.64

Table 3

Pearson correlations Between Parent, Child, and Teacher Emotion Dysregulation (ED), Negative Urgency (NU), and Aggression

	1	2	3	4	5	6	7	8	9	10
1. Parent-reported ER	--									
2. Child-reported ER	.34	--								
3. Teacher-reported ER	.37	.38	--							
4. Parent-reported NU	-.73**	-.18	-.34	--						
5. Child-reported NU	.21	.79**	.43*	-.21	--					
6. Parent-Reported RA	.62**	.08	.28	-.53**	.08	--				
7. Child-Reported RA	.36	.64**	.53**	-.26	.66**	.43*	--			
8. Teacher-reported RA	.07	.22	.68**	-.25	.43	.39	.54*	--		
9. Task RA	.16	.14	.03	-.15	.21	.05	.03	-.35	--	
10. Composited RA	.58**	.42*	.42*	-.47*	.43*	.85**	.84**	.55*	.01	--

** $p \leq .01$, * $p \leq .05$

Table 4

Pearson Correlations Between Parent, Child, and Teacher Emotion Dysregulation (ED), Negative Urgency (NU), and Aggression with Potential Covariates

	Age	PDS
1. Child-reported ED	.18	.18
2. Teacher-reported ED	.26	.46*
3. Parent-reported NU	-.17	-.43*
4. Child-reported NU	.23	.22
5. Composite RA	.08	.13
6. Teacher RA	.11	.16
7. Task RA	.16	-.10

** $p \leq .01$, * $p \leq .05$

Table 5

Summary of Multiple Regression Estimating Composited Reactive Aggression

Variable	*B*	*SE B*	*t*	*β*
Parent-Report Emotion Dysregulation	.32	.10	3.31**	.52
Child-Report Negative Urgency	.16	.08	2.08*	.33

Note: * $p < .05$, ** $p < .01$

Table 6

Summary of Multiple Regression Estimating Teacher-Report Proactive Aggression

Variable	*B*	*SE B*	*t*	*β*
Parent-Report Emotion Dysregulation	1.67	.67	2.48*	.58
Child-Report Negative Urgency	.13	.36	.35	.08

Note: * $p < .05$, ** $p < .01$

Table 7

Pearson Correlations Between Parent, Child, and Teacher-Reported Aggression With SIP Biases and Parenting Variables

	Parent-report PA	Teacher Report PA	Task PA
1. Outcome Expectation Bias	.11	.21	.10
2. APS - Parental Involvement	.19	.14	.25
3. APS – Inconsistent Discipline	.52**	-.20	.20
4. APS – Positive Parenting	.34	.09	-.11

** $p \leq .01$, * $p \leq .05$

Table 8

Correlations Between Parent, Child, And Teacher –Reported Proactive Aggression (PA) with Potential Covariates

	Parent-report PA	Teacher Report PA	Task PA
1. Age	.002	.18	-.34
2. Pubertal Development	.28	.14	-.36
3. Sex	.06	.00	-.01

** $p \leq .01$, * $p \leq .05$

Table 9

Summary of Hierarchical Regression Estimating Parent-Reported Proactive Aggression

Step/Variable	R^2	ΔR^2	*B*	*SE B*	*t*	*β*
Step 1	.01	.01				
Outcome Expectancy Bias			.03	.06	.53	.11
Step 2	.38	.37				
APS - Reported Inconsistent Discipline			.03	.01	2.86**	.50
APS – Reported Positive Parenting			.67	.45	1.46	.26
Step 3	.47	.08				
BiasXInconsistentDiscipline			.03	.03	1.27	.91
BiaxXPositiveParenting			-.23	.14	-1.65	-1.41

Note: * $p < .05$, ** $p < .01$

Table 10

Summary of Hierarchical Regression Estimating Teacher-Reported Proactive Aggression

Step/Variable	R^2	ΔR^2	*B*	*SE B*	*t*	*β*
Step 1	.04	.04				
Outcome Expectancy Bias			.24	.28	.85	.21
Step 2	.25	.20				
APS - Reported Inconsistent Discipline			-.10	.05	1.81	-.56
APS – Reported Positive Parenting			-.79	2.47	-.32	-.08
Step 3	.38	.14				
BiasXInconsistentDiscipline			.10	.11	.91	1.01
BiaxXPositiveParenting			-.74	.48	-1.55	-1.65

Note: * $p < .05$, ** $p < .01$

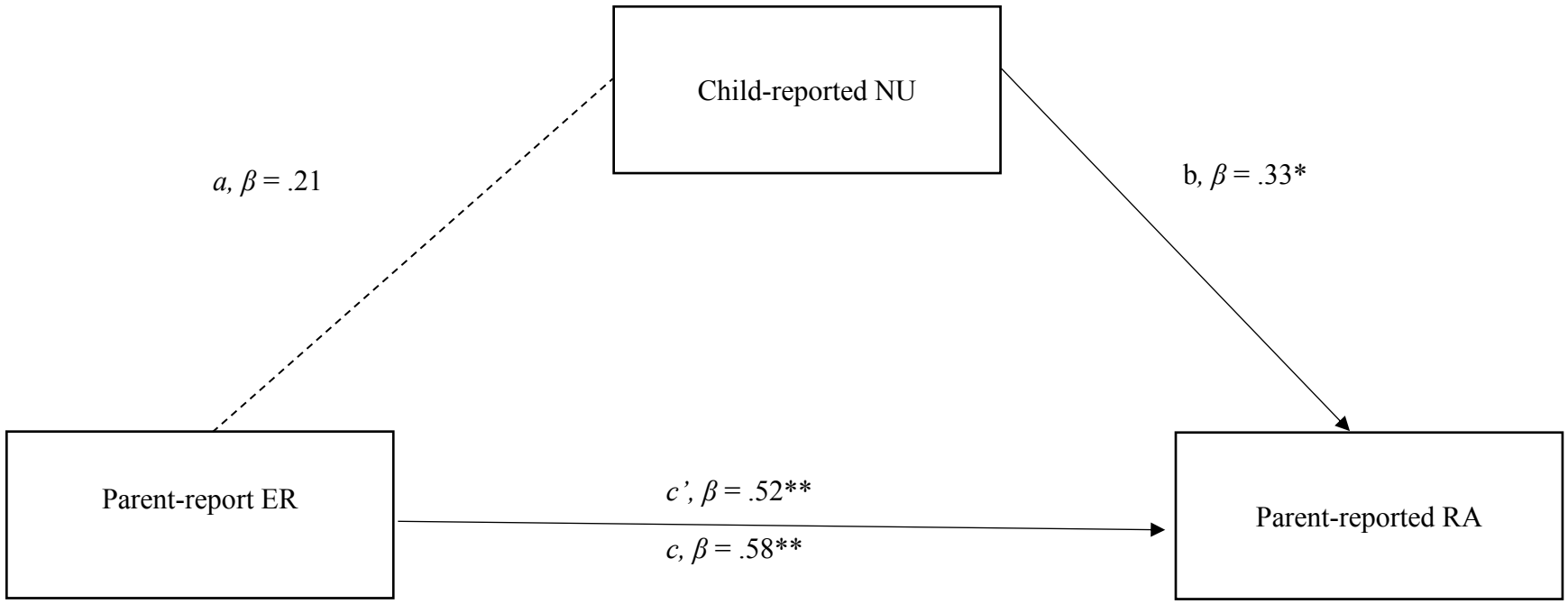

Figure 1. Results of indirect effects analysis with parent and child data
Note: Dotted line represents nonsignificant path

- * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

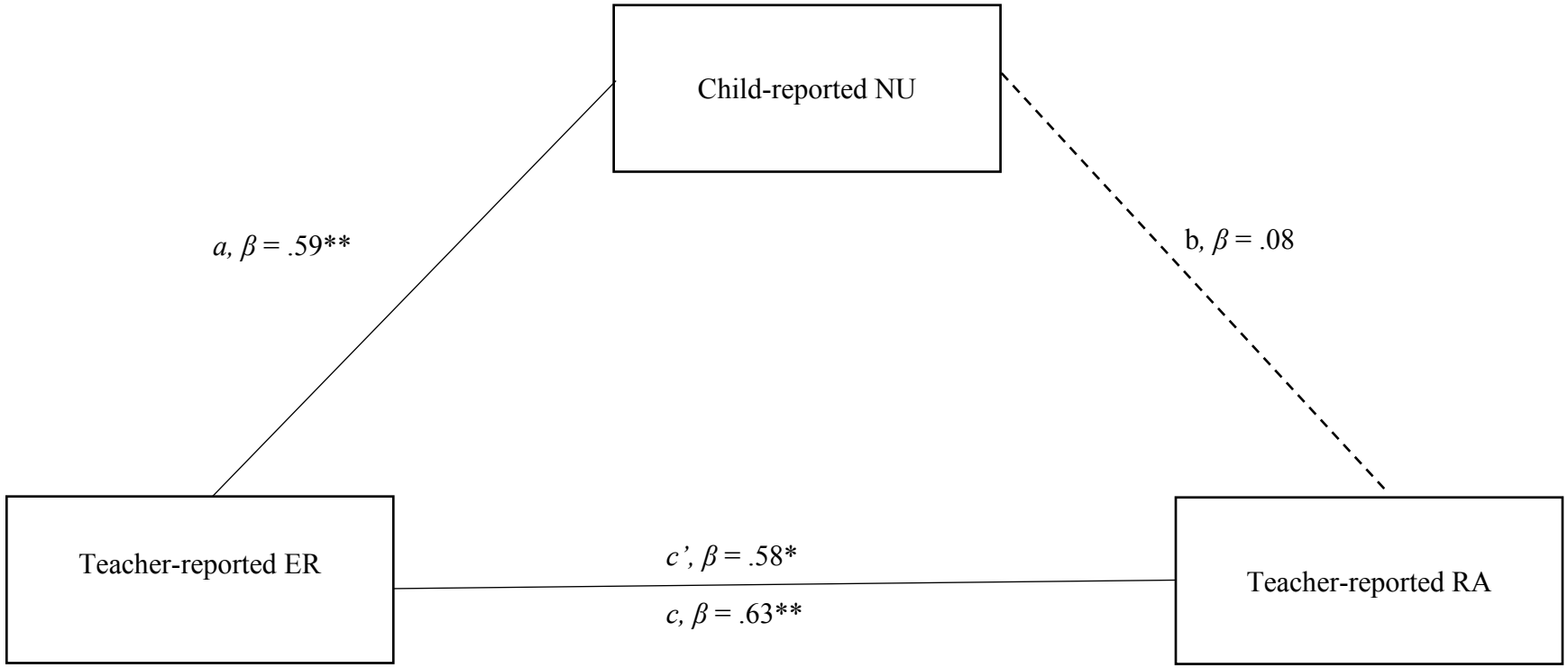

Figure 2. Results of indirect effects analysis with teacher-reported data
Note: Dotted line represents nonsignificant path

- * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Appendix A
Social Information Processing Vignettes

Male Elementary School Vignettes

1. Pretend that you just got a tablet. You bring it to school to show your friends, but now you can't find it. The last time you remember seeing it was when you were working with a group of other kids on a project. You see Jacob holding your tablet. You walk up to Jacob, and he hands you your tablet.
2. Pretend that you are standing on the playground playing catch with a kid named Landon. You throw the ball to Landon, and he catches it. You turn around and next thing you know is that Landon has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot.
3. Pretend that its lunch time and you brought your favorite cookies in from home. You look for your lunchbox but can't find it. You look around and saw Liam looking through your lunch box. He walks up to you and hands it back. He tells you he thought it was his lunchbox.
4. Pretend that you just got to school and are walking down the hallway. You're carrying your backpack and talking to a friend. Suddenly, a kid named Matt bumps you from behind. You stumble and fall, and everything from your backpack goes flying across the floor. The other kids in the hall start laughing.
5. Pretend that you are walking to school and you're wearing your brand-new shoes. You really like your new shoes, and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named Noah. You stumble into a mud puddle and your new shoes get muddy.
6. Pretend that you and your classmates are about to play a game of soccer. Jackson and Sam are chosen as team captains. Pretend that every time Jackson has been captain, he has always chosen you last. You see Jackson looking at you before he begins to choose kids. Jackson chooses you close to first.
7. Pretend that you just bought lunch at school and you're walking to your seat. Suddenly, a kid named Ethan bumps you from behind and your food spills all over your shirt. Your shirt is covered in pizza sauce.
8. Pretend it's the end of the day and you're getting your backpack together. You had brought in a toy that morning to show a kid named Josh. You want to show the toy to Josh but you can't find it. You look up and see James holding the toy.
9. Pretend that you are walking into the lunchroom at school and you're walking to your seat. Someone named Braydon is in your normal seat. He is whispering and laughing with your best friend, Elijah. When you walk up to the table, they stop whispering and look away.

Male Middle School Vignettes:

1. Pretend that you can't find your tablet. The last time you remember seeing it was when you were working with a group of other kids on a project. Later that day you see Jacob holding your tablet. You walk up to Jacob, and he hands you your tablet.
2. Pretend that you are in gym class playing catch with a kid named Landon. You throw the ball to Landon, and he catches it. You turn around and next thing you know is that Landon has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot.
3. Pretend that you have just arrived at school, and you were really in a rush. When you get to the classroom, you realize that you left your jacket in the hallway by your locker. You go into the hallway to get it and see a kid named Liam holding your jacket and walking away from around. You call his name, and he hands you the jacket.
4. Pretend that you just got to school and are walking down the hallway. You're carrying your backpack and talking to a friend. Suddenly, a kid named Matt bumps you from behind. You stumble and fall, and everything from your backpack goes flying across the floor. The other kids in the hall start laughing.
5. Pretend that you are walking to school and you're wearing brand new shoes. You really like your new shoes, and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named Noah. You stumble into a mud puddle and your new shoes get muddy.
6. Pretend that you and your classmates are about to play a game of soccer. Jackson and Sam are chosen as team captains. Pretend that every time Jackson has been captain, he has always chosen you last. You see Jackson looking at you before he begins to choose kids. Jackson chooses you close to first.
7. Pretend that you just bought lunch at school. Suddenly, a kid named Ethan bumps you from behind and your food spills all over your shirt. Your shirt is covered in pizza sauce.
8. Pretend that you are walking into the lunchroom at school and you're walking to your seat. Someone named Braydon is in your normal seat. He is whispering and laughing with your best friend, Elijah. When you walk up to the table, they stop whispering and look away.
9. Pretend it's the end of the day and you're getting your backpack together. You had brought something in that morning to show a kid named, Josh. You want to show it to Josh but you can't find it. You look up and see James holding the toy.

Female Elementary School Vignettes:

1. Pretend that you just got a tablet. You bring it to school to show your friends, but now you can't find it. The last time you remember seeing it was when you were working with a group of other kids on a project. You see Amy holding your tablet. You walk up to Amy, she hands you your tablet.
2. Pretend that you are standing on the playground playing catch with a kid named Olivia. You throw the ball to Olivia, and she catches it. You turn

around and next thing you know is that Olivia has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot.

3. Pretend that its lunch time and you brought your favorite cookies in from home. You look for your lunchbox but can't find it. You look around and saw Alexis looking through your lunch box. She walks up to you and hands it back. She tells you she thought it was her lunchbox.
4. Pretend that you just got to school and are walking down the hallway. You're carrying your backpack and talking to a friend. Suddenly, a kid named Brittany bumps you from behind. You stumble and fall, and everything from your backpack goes flying across the floor. The other kids in the hall start laughing.
5. Pretend that you are walking to school and you're wearing your brand-new shoes. You really like your new shoes, and this is the first day you have worn them. Suddenly, kid named Alex bumps you from behind. You stumble into a mud puddle and your new shoes get muddy.
6. Pretend that you and your classmates are about to play a game of soccer. Haley and Sarah are chosen as team captains. Pretend that every time Haley has been captain, she has always chosen you last. You see Haley looking at you before she begins to choose kids. Haley chooses you close to first.
7. Pretend that you just bought lunch at school and you're walking to your seat. Suddenly, a kid named Ava bumps you from behind and your food spills all over your shirt. Your shirt is covered in pizza sauce.
8. Pretend it's the end of the day and you're getting your backpack together. You had brought in a toy that morning to show a kid named, Josie. You want to show the toy to Josie, but you can't find it. You look up and see Charlotte holding the toy.
9. Pretend that you are walking into the lunchroom at school and you're walking to your seat. Someone named Alyssa is in your normal seat. She is whispering and laughing with your best friend, Kayden. When you walk up to the table, they stop whispering and look away.

Female Middle School Vignettes:

1. Pretend that you can't find your tablet. The last time you remember seeing it was when you were working with a group of other kids on a project. Later that day you see Amy holding your tablet. You walk up to Amy, and she hands you your tablet.
2. Pretend that you are in gym class playing catch with a kid named Olivia. You throw the ball to Olivia, and she catches it. You turn around and next thing you know is that Olivia has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot.
3. Pretend that you have just arrived at school, and you were really in a rush. When you get to the classroom, you realize that you left your jacket in the hallway by your locker. You go into the hallway to get it and see a kid named Alexis holding your jacket and walking away from around. You call her name, and she hands you the jacket.

4. Pretend that you just got to school and are walking down the hallway. You're carrying your backpack and talking to a friend. Suddenly, a kid named Brittany bumps you from behind. You stumble and fall, and everything from your backpack goes flying across the floor. The other kids in the hall start laughing.
5. Pretend that you are walking to school and you're wearing brand new shoes. You really like your new shoes, and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named Taylor. You stumble into a mud puddle and your new shoes get muddy.
6. Pretend that you and your classmates are about to play a game of soccer. Haley and Sarah are chosen as team captains. Pretend that every time Haley has been captain, she has always chosen you last. You see Haley looking at you before she begins to choose kids. Haley chooses you close to first.
7. Pretend that you just bought lunch at school. Suddenly, a kid named Ava bumps you from behind and spills your food all over your shirt. Your shirt is covered in pizza sauce.
8. Pretend that you are walking into the lunchroom at school and you're walking to your seat. Someone named Alyssa is in your normal seat. She is whispering and laughing with your best friend, Kayden. When you walk up to the table, they stop whispering and look away.
9. Pretend it's the end of the day and you're getting your backpack together. You had brought something in that morning to show a kid named, Josie. You want to show it to Josie, but you can't find it. You look up and see Charlotte holding the toy.

Appendix B

Aggression Task Trial Schedule

Female Opponent: Jasmine
Male opponent: Jordan

- Trial 1: Win
- Trial 2: Win
- Trial 3: Win
- Trial 4: Win
- Trial 5: Loss
    - Point loss: 1
    - Message: Nice try, I'll be cool. I'll only take 1
- Trial 6: Win
- Trial 7: Loss
    - Point loss: 0
    - Message: I'll let you slide on that one, I won't take any points.
- Trial 8: Win
- Trial 9: win (AGG 7)
- Trial 10: loss
    - Point loss: 2
    - Message: You lost, but you're getting better. I'll take 2 points.
- Trial 11: win
- Trial 12: win
- Trial 13: loss
    - Point loss: 8
    - Message: Let's see... I think I'll take 8 points from you this time.
- Trail 14: Win
- Trial 15: Loss
    - Point loss: 9
    - Message: Na na na na na! I'm taking 9 points this time
- Trial 16: Win
- Trial 17: Loss
    - Point Loss:1
    - Message: I won, but I'll give you a break. I'll just take 1 point
- Trial 18: Win
- Trial 19: Loss
    - Point Loss: 10
    - Message: You're a basket case at this game! Minus 10!
- Trial 20: Win
- Trial 21: Win
- Trial 22: Loss

    - Point loss: 10
    - Message: Nice try, speedo! What's the matter? Is your hand stuck in cement? You lose another 10!
- Trial 23: Win
- Trial 24: Win
- Trial 25: Win
- Trail 26: Win
- Trail 27: Win
- Trial 28: Win

CURRICULUM VITAE

Kelly Slaughter

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Kelly.slaughter@louisville.edu | 513-417-4857

EDUCATION

Pre-Doctoral Internship 2020 - 2021
University of Louisville School of Medicine – Norton Children's Hospital
APA Accredited

Doctor of Philosophy, Clinical Psychology 2016 - 2021
University of Louisville, Louisville, KY
Expected Graduation: June 2021
Current GPA: 3.97
Dissertation: Social Cognition, Impulsivity, and Emotion Regulation Factors in Aggressive Behavior Among Children with Attention-Deficit/Hyperactivity Disorder
Defended: August 2021
Chair: Paul Rosen

Master of Science, Clinical/Behavioral Psychology 2014 - 2016
Eastern Michigan University, Ypsilanti, MI
Award date: May 2016
Cumulative GPA 3.90

Bachelor of Arts, Psychology 2010 - 2014
University of Kentucky, Lexington, KY
Award date: May 2014
Cumulative GPA: 3.97

HONORS & AWARDS

- Stanley A. Murrell Scientist-Practitioner Award, University of Louisville 2020
- Excellence in Peer Mentorship, University of Louisville 2020
- Excellence in Teaching, University of Louisville 2018
- Graduate Research Award, University of Michigan Hospital 2016
  26th Annual Pediatric Research Symposium
- Graduated *summa cum laude* from the University of Kentucky 2014

CLINICAL EXPERIENCE

Post-Doctoral Fellowship in Pediatric Psychology August 2021 - Present
University of Louisville School of Medicine, Louisville, KY

Clinical Responsibilities
Pediatric Inpatient Consultation/Liaison
Supervisors: Dr. Bryan Carter, Ph.D.; Dr. Kayla LaRosa, Ph.D., Dr. Morgan Daffin, Psy.D.

- Evaluated children and adolescents with acute and chronic medical conditions in the hospital setting
- Provide brief evidence-based interventions for pain management, sleep hygiene, adjustment to chronic health conditions, refeeding, phobias, adherence, and lifestyle management.
- Collaborated with interdisciplinary teams to develop treatment plans, including nursing, medical providers, child life specialists, and art and music therapists.
- Conducted risk and safety assessments for patients with suicidal ideation, self-injurious behaviors, and symptoms of psychosis.

Children's Health and Illness Recovery Program (CHIRP)
Supervisors: Dr. Bryan Carter, Ph.D.; Dr. Kayla LaRosa, Ph.D.; Dr. Morgan Daffin, Psy.D.

- Coordinate a 12-week, evidence-based group therapy to children with chronic medical conditions
- Provide evidence-based treatment to promote functioning, including skills such as problem solving, pacing, reducing avoidance, sleep hygiene, and assertiveness.
- Write 504-plans for chronic health conditions such functional neurologic disorder, diabetes, asthma, and Ehlers-Danlos Syndrome, among others.
- Engage in weekly seminar/didactic on the psychological factors in chronic illness.

Pre-Doctoral Internship in Clinical Psychology July 2020 - June 2021
University of Louisville School of Medicine, Louisville, KY
Child/Pediatric Psychology

Rotations
Outpatient Therapy and Assessment
Supervisors: Dr. Courtney Smith, Ph.D.; Dr. Kristie Vail Schultz, Ph.D.; Dr. Sunnye Mayes, Ph.D.

- Provided individual therapy via telehealth to children and adolescents with internalizing and externalizing
  disorders, as well as children with medical conditions
- Utilized evidenced-based therapy, including CBT, PMT, MI, and behavioral therapy.
- Co-facilitated the Children's Health and Illness Recovery Program (CHIRP) to promote functioning
  adolescents among adolescents with chronic illnesses
- Completed the LGBTQ+ Affirming Healthcare Series

Emergency Department Assessment
Supervisor: Dr. Gangadeep Kaur, MD

- Conducted safety and assessments for suicidal and homicidal ideation in the emergency department of
  Norton Children's Hospital
- Provided recommendations to the medical team and family regarding the appropriate level of care,
  including inpatient hospitalization, partial hospitalization, intensive outpatient, and outpatient treatment.

Pediatric Diabetes
Supervisor: Dr. Kristie Vail Schultz. Ph.D.

- Conduct brief assessment and consultation for children admitted to the hospital with new-onset
  diabetes and diabetic ketoacidosis
- Presented disposition and impressions to medical providers to assist in discharge planning
- Provided brief intervention utilizing CBT, behavioral therapy techniques, lifestyle management,
  relaxation training, and motivational interviewing**.**

Pediatric Solid Organ Transplant
Supervisor: Dr. Courtney Smith, Ph.D.

- Participated in multidisciplinary team meetings alongside medical providers, social workers, and dieticians.
- Conducted brief assessment and consultation during patients' outpatient appointments
- Conducted pre-transplant evaluations and communicated results of the evaluation to the medical team

Pediatric Inpatient Consultation/Liaison Team
Supervisors: Dr. Bryan Carter, Ph.D.; Dr. Kayla LaRosa, Ph.D.

- Evaluated children and adolescents with acute and chronic medical conditions referred from
  Pediatric Intensive Care Unit, Neurology, Endocrinology, Gastroenterology, and Pediatric Hospitalists
- Provide brief evidence-based interventions for pain management, sleep hygiene, adjustment to chronic health conditions, refeeding, phobias, adherence, and lifestyle management.
- Collaborated with interdisciplinary teams to develop treatment plans as well as behavior plans to increase adherence and ensure safety. Teams included medical providers, child life specialists, and art and music therapists.
- Conducted risk and safety assessments for patients following intentional and accidental ingestion

Practicum Experiences

Noble H. Kelley Psychological Services Center, Louisville, KY Aug 2016 – July 2020

Integrative Therapy Team Aug 2019 – July 2020
Supervisor: Dr. Rich Lewine, Ph.D.

- Worked with individuals with MDD, GAD, OCD, and gender dysphoria

- Integrated and customized therapy for clients, including CBT, ERP, and affirmative therapy
- Conducted peer supervision CBT, exposure, DBT skills training, and problem solving therapy

Cognitive Behavioral Therapy Team Aug 2018 – July 2018
Supervisor: Dr. Jenny Petrie, Ph.D.

- Conducted CBT for the treatment of children and adolescents with SAD, GAD, MDD, and ADHD
- Provided supervision for PCIT and CBT
- Collaborated with professionals, such as teachers, counselors, pediatricians, and psychiatrists.
- Attended 504 planning meetings at schools with clients

Eating Disorder Specialty Treatment Team Jan 2018 - Aug 2018
Supervisor: Dr. Cheri Levinson, Ph.D.

- Provided therapy for adolescents and adults with anorexia nervosa, bulimia nervous
- Utilized family based therapy and CBT for eating disorders
- Worked with primary care physicians, psychiatrists, and dieticians.

Children with ADHD and Related Disorders Treatment Team
Sept 2016 - Dec 2017
Supervisor: Dr. Paul Rosen, Ph.D.

- Provided therapy for children with ADHD and comorbid disorders such as ODD, anxiety
  disorders, and bipolar disorder.
- Utilized therapies such as behavioral therapy, CBT, organization skills training, problem
  solving therapy, and collaborative & proactive solutions
- Led Managing Frustration for Children group therapy, a 12-week intervention for children with
  emotion dysregulation. Led the group five times total.
- Led a parenting skills group in conjunction with the Managing Frustration for Children group therapy
- Providing intellectual, academic assessments, and behavioral assessments for children with ADHD

Child and Adult Assessment Team May 2017 – July 2020
Supervisors: Dr. Bernadette Walter, Ph.D.; Dr. David Winsch, Ph.D.

- Conducted assessments for questions of ADHD, gifted and talented, learning disorders, anxiety, and depression
- Consulted with physicians, teachers, counselors, and other care providers
- Administered assessments of intellectual functioning, personality, academic achievement with children and adults
- Wrote integrative reports that include history, symptoms, interpretation of assessment results, diagnosis, conceptualization, and recommendations.

External Clinical Child Practicum Student June 2017 - June 2018
Square One: Specialists in Child and Adolescent Development, Louisville, KY
Supervisor: Dr. David Causey, Ph.D.

- Provided outpatient therapy for children and adolescents aged 4 – 18
- Utilized evidence-based treatments, including PCIT, CBT, and PMT
- Administered assessments of intellectual and neuropsychological functioning, academic
  achievement, and phonological processing with children and adults
- Wrote integrative reports that include background, impairment, interpretation of assessment
  results, diagnosis, conceptualization, and recommendations

External Clinical Child Practicum – Private Practice Aug 2015 - June 2016
Thriving Minds Behavioral Health, Brighton, MI
Supervisor: Dr. Aimee Kotrba, Ph.D.

- Conducted assessments for children with selective mutism
- Provided outpatient therapy with children with GAD, SAD, ADHD, and ODD, and their families
- Provided intensive therapy for children with selective mutism at Confident Kids Camp,
  a 5-day intensive therapy camp for children with selective mutism
- Administered and interpreted the BAYLEY for children 1 – 2 years of age, as part of an integrative assessment for premature infants and babies

RESEARCH

Post-Doctoral Fellowship in Pediatric Psychology Aug 2021 - Present
University of Louisville School of Medicine, Louisville, KY

Research Responsibilities
Children's Health and Illness Recovery Program (CHIRP)
Supervisors: Dr. Bryan Carter, Ph.D.

- Manage referrals from medical providers from the Norton Healthcare system and community
- Conduct intake assessments for potential patients to assess appropriateness for group
- Analyze data to assess group efficacy and factors associated with improved functioning

Research on ADHD and Children's Emotion Regulation (RACER) Lab
University Of Louisville, Louisville, KY Aug 2016 – Aug 2021
Advisor: Dr. Paul Rosen, Ph.D.
Dissertation: Social Cognition, Impulsivity, and Emotion Regulation Factors in Aggressive Behavior Among Children with Attention-Deficit/Hyperactivity Disorder

- Successfully defensed August 2021
- Aim: Elucidate the divergent pathways to reactive and proactive aggression among children with ADHD

Project: Open Trial of the Managing Frustrations for Children (MFC) Group Therapy

- Aim: Assess the efficacy of MFC in a community clinic, including changes in global impairment, emotion regulation, and aggressive behavior.
- Review of records and data from 12 administrations of the MFC group

Project: Study of Children's Emotions

- Aim: Assess the physiological emotion regulation processes among children with ADHD
- Data collection:
    - Administrated brief intellectual (WASI-II) and achievement tests (WRAT-IV)
    - Administered diagnostic structured interview to parents of participants
    - Administered ECG to participants to assess respiratory sinus arrhythmia
    - Wrote comprehensive diagnostic evaluation reports and provided feedback to parents

General Lab Responsibilities

- Managed day-to-day operations including scheduling participants, maintaining materials,
  managing databases and collecting data.
- Authored and co-authored papers (8) and posters (8)
- Supervised and coordinated training for undergraduate research assistants
- Co-mentored undergraduate theses and posters (3)

Pediatric Behavioral Medicine Lab Jan 2015 - May 2016
Eastern Michigan University, Ypsilanti, MI
Advisor: Dr. Flora Hoodin, Ph.D.

- Administered questionnaires to parents of children with cancer at a major Midwestern
  cancer center on a weekly basis
- Wrote and co-authored abstracts, posters, and presentations

RISK Laboratory Jan 2013 - May 2014
University Of Kentucky, Lexington, KY
Advisor: Dr. Michelle Martel, Ph.D.

- Administered experimental measures such as clinical interviews, behavioral tasks, questionnaires, and executive functioning tasks
- Trained research assistants as a senior member of the lab

PUBLICATIONS

1. **Slaughter, K.E.,** Leaberry, K.D., Fogleman, N.D., & Rosen, P.J. (2019). Reactive and proactive aggression in children with and without ADHD and negative emotional lability. *Social Development,* Advanced online publication
2. Leaberry, K. D., Rosen, P. J., **Slaughter, K.E.,** Reese, J. S., & Fogelman, N. D. (2019). Temperamental negative affect, emotion-specific regulation, and concurrent internalizing and externalizing pathology among children with ADHD. *ADHD Attention Deficit and Hyperactivity Disorder,* Advanced online publication. doi: https://doi.org/10.1007/s12402-019-00294-8
3. Rosen, P. J., Leaberry, K. D., **Slaughter, K.E.,** Fogleman, N. D., Walerius, D. M., Loren, R. E., & Epstein, J. N. (2018). Managing frustration for children (MFC) group intervention for children with ADHD: An open trial of a novel group intervention for emotion regulation difficulties. Cognitive and Behavioral Practice, online first. https://doi.org/10.1016/j.cbpra.2018.04.002

4. Fogleman, N.D., Leaberry, K.D. Rosen, P.J., Walerius, D.M., & **Slaughter, K.E.** (2018). How do children with ADHD talk about frustration? Use of a novel frustration narrative task. *Attention Deficit and Hyperactivity Disorders*, *online first.* Doi:10.1007/s12402-018-0255-z.
5. Leaberry, K.D., Rosen, P.J., Fogleman, N.D., Walerius, D.M., & **Slaughter, K.E**. (2018). Physiological emotion regulation in children with ADHD with and without comorbid internalizing disorders: A preliminary study. *Attention Deficit and Hyperactivity Disorders*, *online first.* Doi:10.1177/s10862-018-9644-z
6. Fogleman, N.D., Leaberry, K.D., Rosen, P.J., Walerius, D.M., **Slaughter, K.E**. (2018) Relation between internalizing behaviors, externalizing behaviors and peer victimization among children with and without ADHD, *Attention Deficit and Hyperactivity Disorders*, *online first.* Doi:10.1007/s12402-018-0248-y.
7. Fogleman, N.D**.**, **Slaughter, K.E**., Rosen, P.J., Leaberry, K.D., & Walerius, D.M. (2018) Emotion regulation accounts for the relation of Attention-Deficit/Hyperactivity Disorder and peer victimization. *Attention Deficit and Hyperactivity Disorders*, *online first.* Doi:10.1177/1087054717734647.
8. Leaberry, K. D., Rosen, P. J., Fogleman, N. D., Walerius, D. M., & **Slaughter, K. E.** (2017). Comorbid internalizing and externalizing disorders predict lability of negative emotions among children with ADHD. *Journal of Abnormal Child Psychology.* Advanced online publication. doi: 10.1177/1087054717734647

CONFERENCE POSTERS AND PRESENTATIONS

1. Flynn, M.F., **Slaughter, K.S.**, Reese, J. Rooney, S., & Rosen, P.J. (2020, November). *Examining the Influence of Negative Affect and ADHD on Domains of Parenting Stress.* The Association for Behavioral and Cognitive Therapies (ABCT), Philadelphia, PA
2. Leaberry, K.D., **Slaughter, K.S.**, Reese, J., Flynn, M.F., Rooney, S., & Rosen, P.J. (2020, November). *Child Self-report of Emotion Dysregulation Is Associated with Emotional Disinhibition on a Novel Emotional Go/no Go Task Among Youth with ADHD*. The Association for Behavioral and Cognitive Therapies (ABCT), Philadelphia, PA
3. **Slaughter, K.E.,** Leaberry, K., Reese, J., & Rosen, P. (2019, November). Urgency and aggression among children with and without ADHD. The Association for Behavioral and Cognitive Therapies, Atlanta, GA.
4. Rooney, S., **Slaughter, K.,** Flynn, M., & Rosen, P. (2019, November) *Influence of ADHD Symptomology on Discrepant Ratings of Emotion Regulation.* Poster presented at the ADHD Special Interest Group (SIG) Research and Practice Exchange (PRECON) at the Annual Convention of the Association for Behavioral and Cognitive Therapies (ABCT), Atlanta, GA.
5. Flynn, M., Reese, J., **Slaughter, K.,** Rooney, S., & Rosen, P. (2019, November). *Parenting daily hassles and confidence in parents of children with ADHD*. Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies (ABCT): ADHD Special Interest Group, Atlanta, GA
6. Hartmann, S., **Slaughter, K.,** Rosen, P.J. (2018, May). Perceived perfectionism estimates externalizing behaviors**,** above and beyond ADHD. The Association for Psychological Science (APS), San Francisco, CA.
7. Daugherty, M., **Slaughter, K.,** Fogleman, N., Rosen, P.J., & Leaberry, K. (2018, April). Social impairment and anger regulation among children with ADHD. Midwestern Psychological Association, Chicago, IL
8. Hartmann, S., **Slaughter, K.,** & Rosen, P.J. (2018, March). Presentation of somatic complaints: ADHD and ADHD with a comorbid internalizing disorder. Southeastern Psychological Association, Charleston, SC.

9. **Slaughter, K.E**., Fogleman, N.D**.**, Leaberry, K.L., Walerius, D.M., Rosen, P.J. (2017, November). Reactive and proactive aggression in children with emotional lability and ADHD. Association for Behavioral and Cognitive Therapies, San Diego, CA.
10. Leaberry, K.D., Fogleman, N.D., **Slaughter, K.E**., Walerius, D.M., Rosen, P.J. (2017, November). Comorbidity predicts anger dysregulation among children with ADHD. Association for Behavioral and Cognitive Therapies, San Diego, CA.
11. Fogleman, N.D., **Slaughter, K.E**., Leaberry, K.D., Walerius, D.M., Rosen, P.J. (2017, November). Relation between emotion recognition and peer victimization among children with ADHD. Association for Behavioral and Cognitive Therapies, San Diego, CA.
12. Fogleman, N.D., **Slaughter, K.E.,** Leaberry, K.D., Walerius, D.M., Rosen, P.J. (2017, November) Emotion dysregulation linked to peer victimization among children with ADHD. Association for Behavioral and Cognitive Therapies, San Diego, CA.
13. **Slaughter, K**., Leaberry, K., Fogleman, N., Walerius, D., & Rosen, P. (2017, April). *Parent-child agreement on children's emotion management style.* Poster presented at the 2017 biannual conference for the Society for Research in Child Development (SRCD), Austin, TX.
14. Leaberry, K.D., Fogleman, N. D., Walerius, D. M., **Slaughter, K. E.,** & Rosen. P. J. (2017, April) *Comorbid internalizing and externalizing disorders predict negative emotional lability among Children with ADHD.* Poster presented to Society for Research in Child Development, Austin, TX.
15. Rosen, P.J., Leaberry, K., Walerius, D., Fogleman, N., & **Slaughter, K.** (2017, April). *Physiological emotion dysregulation among children with ADHD is predicted by comorbid disorders*. Symposium for "Understanding Heterogeneity in Physiological Indices of Emotion Regulation in Children with ADHD." Presented at the 2017 biennial conference for the Society for Research in Child Development (SRCD) Austin, TX.
16. Perez, M., **Slaughter, K**., Armstrong, R., Ostarello, L., Kentor, R., Stanton, C., Byrd, M., Hoodin, F., Kullgren, K., Mody, R., & Yanik, G. (2015, November). *Parent-factors affect what medical information parents choose to disclose to their children with cancer*. Presentation at the 2015 annual Pediatric Research Symposium of University of Michigan Health Systems, Ann Arbor, MI.
17. **Slaughter, K**., Perez, M., Armstrong, R., Ostarello, L., Kentor, R., Stanton, C., Byrd, M., Hoodin, F., Kullgren, K., Mody, R., & Yanik, G. (2015, November). *Parenting and pediatric oncology: Parent-factors affect what medical information parents choose to disclose to their children with cancer*. Poster presented at the 2015 annual Association for Behavioral and Cognitive Therapies (ABCT), Chicago, IL.
18. Kentor, K., Perez, M., Ostarello, M., Armstrong, R., **Slaughter, K**., Hoodin, F., Byrd, M., Kullgren, K., Stanton, C., Mody, & R., Yanik, G. (2015, November). *When "no news" isn't good news: Experience avoidance and information disclosure to pediatric cancer patients.* Poster presented at the 2015 annual conference for the Association for Behavioral and Cognitive Therapies (ABCT), Chicago, IL.
19. Ostarello, L., Armstrong, R., Kentor, R., Perez, M., **Slaughter, K**., Hoodin, F., Byrd, M., Kullgren, K., Stanton, C., Mody, R., & Yanik, G. (2015, November). *Will primary caregivers answer questions regarding disclosure of medical information to their children with oncologic disorders?* Poster presented at the 2015 annual conference for the Association for Behavioral and Cognitive Therapies (ABCT), Chicago, IL.
20. **Slaughter, K.E.,** Gremillion, M.L., & Martel, M.M. (2014, April). *Relationship between ADHD symptoms and impulsivity traits in young adults.* Poster presented at the 2014 National Conference on Undergraduate Research (NCUR), Lexington, KY.

TEACHING EXPERIENCE

Clinic Graduate Teaching Assistant
University of Louisville, Louisville, KY
PSY 693 Clinical Interviewing May 2018 – May 2020

- Instructed first-year doctoral student clinical interviewing course
- Provided live supervision of intake interview
- Provided live and written feedback following the interview
    - **Lead Instructor: Barbara Stetson, PhD**

PSY 680: Intellectual and Cognitive Assessment (PSY 680) Jan 2020 – June 2020

- Instructed first-year doctoral students on administration of the WISC-V and WAIS-IV
- Graded administration of assessment administration and scoring
- **Lead Instructor: Bernadette Walter, PhD**

Graduate Teaching Assistant Sept 2016 – May 2019
University Of Louisville, Louisville, KY
PSY 302: Research Methods in Psychology

- Independently taught lab sessions aimed at teaching students to conduct research and write research reports
- Lectured when the professor was unavailable
- Graded all classwork and maintained the class gradebook

PSY 301: Quantitative Methods in Psychology

- Independently instructed lab sessions aimed at applying principles from lectures
- Led and Co-led lectures for classes of 30-50 students
- Created exams and homework assignments
- Graded all work and maintained the gradebook

PSY 201: Introduction to Psychology

- Graded classwork and proctored exams
- Met with students individually to discuss difficulties, grades, and study strategies

Graduate Teaching Assistant Aug 2014 - May 2016
Eastern Michigan University, Ypsilanti, MI
PSY 103: General Psychology Lab

- Independently instructed three sections of an introductory psychology lab per semester
- Evaluated and revised the lab manual, curriculum, and grading criteria for future semesters
- Graded assignments and maintained the gradebook
- Designed Canvas course shell