# A Developmental Perspective on Bullying:

# Exploring Risk Factors from Preschool through High School

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## Dissertation Abstract

This dissertation presents a body of work exploring risk factors for bullying involvement across various developmental contexts, including preschool, middle school, and high school. Risk factors for types of bullying involvement were examined in different developmental stages with the goal of better understanding this complex behavior and informing prevention and intervention efforts. The present dissertation is written in accordance with the Curry School of Education and Human Development Guidelines for Manuscript Style Dissertations. The manuscript style dissertation specifies that the doctoral candidate be the principle author on three research manuscripts. Also submitted is a document entailing the conceptual and theoretical links among the three manuscripts. I am the lead author on all three manuscripts presented here in their entirety. The following is a description of the three manuscripts and conceptual linking statement.

The conceptual linking statement provides a cohesive theoretical framework for the three separate manuscripts included in the dissertation. For the present study, numerous theoretical frameworks were drawn upon to inform our understanding of bullying through a developmental lens. Specifically, the social ecological model, the social ecological diathesis stress model, and social cognitive theory were used to anchor a set of inter-related research questions, findings, and implications. The first paper in this dissertation style manuscript was a comprehensive review of the literature on bullying in preschool entitled, “Understanding bullying among

preschool aged children," (Bistrong, E., Bradshaw, C., & Morin, H. (2016). Understanding bullying among preschool-aged children. In O.N. Saracho (Ed.), *Contemporary perspectives on research on bullying and victimization in early childhood education*, (pp. 61-86). Charlotte, NC: Information Age Publishing). This comprehensive review of the literature examined preschool bullying including definition, prevalence, measurement, intervention, and prevention, representing the earliest developmental view in current line of research.

The second study consisted of an empirical study of bystander reactions to bullying amongst middle school students entitled, "Youth Reactions to Bullying: Exploring the factors associated with students' willingness to intervene," (Bistrong, E., Bottiani, J. H., & Bradshaw, C. P. (2019). Youth reactions to bullying: Exploring the factors associated with students' willingness to intervene. *Journal of School Violence*, 1-14. DOI: 10.1080/15388220.2019.1576048). In this study, we found that personal factors, including previous victimization and overall adjustment, and school perception factors, were associated with students' reactions to witnessing bullying.

The third and final study in this manuscript style dissertation was an empirical study of neuropsychological and social cognitive predictors of bullying in middle school utilizing performance measures entitled, "Neuropsychological and Cognitive Aspects of Bullying: Exploring the role of select executive functions and social information processing." This manuscripts will be submitted to for peer review upon completion. Key findings from this manuscript suggested that underlying processes including executive functioning and social information processing play an important role in bullying behavior.

# A Developmental Perspective on Bullying:

# Exploring Risk Factors From Preschool Through High School

## Rationale and Conceptual Link across the Three Manuscripts

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A Developmental Perspective on Bullying:

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Rationale and Conceptual Link across the Three Manuscripts

## Introduction

Bullying behavior is a significant concern that is associated with poor outcomes across the lifespan. Recent estimates from the Centers for Disease Control (CDC, 2018) indicated that 19% of students were bullied at school and approximately 15% of students were cyber bullied (CDC, 2018). Unfortunately, this form of aggressive behavior can be present as early as preschool ages and persist across settings into adulthood, including the workplace (Lutgen-Sandvik, Tracy, & Alberts, 2007). Bullying, as defined by Olweus (1993), is intentional and repeated acts of aggression that take on physical (e.g., hitting), verbal (e.g., name calling), and relational forms (e.g., rumor spreading), which usually involve a power differential, and can be experienced in overt (e.g., direct: name calling) or covert (e.g., indirect: rumor spreading) ways (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014). The advent of the technological age ushered in a new type of bullying, cyber bullying. This behavior is defined as engagement in relational or verbal aggression through electronic means. Understanding bullying across stages of development is essential to informing intervention and prevention efforts, given the host of negative outcomes associated with bullying (Ialongo, Vaden-Kiernan, & Kellam, 1998; Moffitt, 2006).

A thorough understanding of bullying demands an understanding of the complexities of youth development (e.g., cognitive, social, brain development) which invariably impact bullying and related behaviors. Throughout years ranging from preschool to high school, youth undergo immense changes with regard to both cognitive and social development (Diamond, 2013; Monks, Smith, & Swettenham, 2005). This can manifest as changes in peer interactions (e.g., increased emphasis on peer relationships), executive functioning (e.g., developing complex reasoning skills), and social cognition (e.g., developing theory of mind), for example. Given these changes, there are various theoretical lenses, which can deepen and enhance our understanding of bullying from a developmentally informed perspective.

## Bullying Across Development

Although Olweus's (1993) definition of bullying is widely accepted (see Gladden et al., 2014; National Academy of Sciences, Engineering, & Medicine 2016), bullying is a complex social phenomenon that shifts across timepoints in social, cognitive, and neuropsychological development. We see evidence of bullying in early childhood, which typically looks like unprovoked aggression, and may consist of more general aggression not yet targeted toward a specific youth (Monks et al., 2005; Sharp & Smith, 2002). During this developmental phase, bullying tends to be direct, physical aggression. As youth enter into grade school and concurrently develop theory of mind, around age 5, bullying begins to adhere to the classic definition by Olweus (Monks et al., 2005). Also around this time, youth begin targeting specific victims repeatedly and intention becomes more salient in the dynamic. It is likely that this development of theory of mind facilitates said targeting of specific victims. As social and cognitive skills become more advanced,

these elementary school youth expand their experience with bullying to include indirect bullying, including relational aggression (Monks et al., 2005).

With regard to social-cognitive functioning, bullying becomes more advanced as youth age in part due to their ability to understand others' perspectives (Vlachou, Andreou, Botsoglou, & Didaskalou, 2011). This enhanced social-cognitive functioning allows youth to better understand how impactful their behaviors can be. For example, preschoolers may be unable to understand the adverse impacts that behaviors targeting one victim could have. In contrast, middle school students are able to conceptualize and take the perspective of victims. This understanding of consequences of actions can lead to more sophisticated instances of bullying that can be more impactful to the target. Unsurprisingly, bullying peaks in middle school, and shows a steady decline in the high school years (Nansel et al., 2001).

## The Social Ecological and Social Ecological Diathesis Stress Model

Bronfenbrenner's social-ecological model (Bronfenbrenner, 1979) can provide strong theoretical explanation of bullying. This framework informs our understanding of youth as they exist in multiple contexts which influence one another. Studying bullying through this broad theoretical lens allows for consideration of multiple contexts that influence bullying, including school, home, and social activities (Monks et al., 2006). The Social Ecological Model is made up of the following five nested levels: microsystems, mesosystems, exosystems, macrosystems, and chronosystems. *Microsystems* (e.g., school environment, parent-child relationships) are the most proximal surroundings of the youth that have a direct impact on their behavior and functioning. Sometimes, microsystems can overlap with one other, such as when a parent is involved in their child's social

interactions. When the microsystems overlap, the Social Ecological Model refers to this as the *mesosystem*, which is the next level in the nested model. The *exosystem* follows the microsystem and the mesosystems, and encompasses them. These are the larger systems in which a student exists such as school systems or neighborhoods. The next level in Bronfenbrenner's nested model is the *macrosystem*, which consists of the broad cultural, political and economic contexts in which an adolescent functions (Bronfenbrenner, 1977). Lastly, the *chronosystem* is the final level in the model and represents the historical and temporal context of the individual, including changes in family or home structure throughout the life course.

Through this lens, bullying can be understood through the interplay between students' individual characteristics and various contexts including peers, family, school, and larger contexts such as community and culture. (Bronfenbrenner, 1977). For example, at the microsystemic level, we can see the personal, school, and familial factors that may influence how students react when they witness bullying. The exosystem may also be important with regard to bullying behaviors, including bystander behaviors. Specifically, the school system in which the student exists can have an important influence on bullying, in accordance with school climate or other school level factors. The macrosystem, which includes broad societal and cultural norms can also influence bullying. For example, research regarding the adverse outcomes of bullying highlights the importance of prevention and intervention. This awareness contributes to anti-bullying norms such as social media campaigns against bullying and celebrity endorsement of anti-bullying programs (Monks et al., 2009).

The social ecological diathesis stress model is another framework that is helpful in enhancing our understanding of bullying, as it helps us further account for individual differences within contexts (Swearer & Hymel, 2015). This model represents the intersection of the social ecological model and the diathesis stress model. Generally, diathesis stress models suggest that behaviors occur as a function of individual diatheses (e.g., cognitive factors, genetic factors) and their reaction to the environment (Cicchetti & Toth, 1998; Lazarus, 1993). In the context of bullying, this model suggests that a youth's adjustment to bullying is a function of the interplay between personal factors, including genetic makeup and temperament, with stress in the environment (i.e., bullying). Merging of the diathesis stress model and the social ecological model, as posited by Swearer and Hymel (2015), provides a solid theoretical framework though which to understand this behavior.

This model contextualizes the social ecological model by allowing researchers to better understand and account for individual's different reactions to bullying. For example, research shows that some students who are victimized will start to show internalizing symptoms (e.g., depression) while others will not, an example of how personal factors (i.e., temperament) can account for different reactions to the same situation. We also know that students who display more internalizing symptoms may be more likely to defend the victim when they witness bullying (Bistrong, Bottiani, & Bradshaw, 2019; Pozzoli & Gini, 2010). In this example, students' different reactions to the same experience within the context of the social ecological model map onto different behavior patterns. Additionally, stronger social cognitive skills, such as theory of mind, may buffer students against becoming bullies, in the context of an anti-bullying climate.

This model may help us understand bullying behavior in terms of the youth's multiple environmental contexts and their genetic, cognitive, and temperamental predispositions.

## Social Cognitive Theory

Another helpful bullying framework is social cognitive theory (SCT; Bandura, 1991), and related theories including social information processing; research in this area helps us account for processes that underlie the various bullying participant roles (e.g., bully, victim, bystander). SCT is based in the principle of social learning theory (Miller & Dollard, 1941; Swearer, Wang, Berry, & Myers, 2014). Social learning theory posits that learning occurs as a result of being directly taught as well as observing the behaviors and consequences of others (Bandura, 1977). This form of social learning is comprised of the following steps: attending to the observed behavior (e.g., noticing that a behavior is occurring), encoding the visual cues, reenacting those visual cues, and being motivated to employ the learned behavior. SCT builds upon this theory by making salient the role of cognition in behavior (Bandura, 1986). In other words, this theory allows us to account for the interplay between the external social environment (e.g., classroom, peer groups) , internal processes (e.g., cognition, executive functions), and outward behaviors (Orpinas & Horne, 2006). Social cognitive theory has been used in explaining aggressive behavior generally as well as bullying specifically.

In the present study, SCT provides a working model to understand the behavior of bullies, victims, and bystanders. Specifically, SCT posits that humans learn by observing and modeling others and that this learned behavior results from personal, behavioral, and environmental influences (Bandura, 2011). From the cognitive perspective, SCT would suggest that students learn to bully in part by their thoughts and

cognitive processes around bullying. This would include attitudinal beliefs and subsequent impact on thoughts. For example, if youth's cognition is that bullying will result in a desired outcome, bullying would be the outward behavioral manifestation of this behavior. In this case, this youth may have learned from a social context (e.g., home with aggressive behavior) that aggression yields a desirable outcome. Importantly, SCT theory posits that repeated acts of bullying or bully assisting would be maintained through environmental reinforcement. In other words, these youth experience positive reinforcers (e.g., increased popularity) which perpetuate future bullying. Often these reinforcers come from the social context (Pepler & Craig, 1995), highlighting the interactive and multi directional nature of SCT theory.

This is one example of how the social context, individual cognitions, and behaviors can result in bullying. In fact, students who witness domestic violence in their homes bully at higher rates than their peers (Baldry, 2003; Bowes et al., 2009). This witnessing of aggression from early stages could be related to bullying that develops in the preschool years. Furthermore, youth whose peer group consists of aggressive children are more likely to bully (Mouttapa, Valente, Gallaher, Rohrbach, & Unger, 2004). Likewise, the increased importance of peer relationships may influence youth to be bullies themselves or act as bully assisters. In sum, social cognitive theory is particularly helpful when studying bullying from a developmental lens, as it accounts for social and cognitive changes occurring throughout development and how those changes manifest behaviorally.

**The Three Manuscripts**

**Manuscript 1.** The first manuscript of this dissertation examined bullying amongst preschoolers, representing the earliest developmental stage in this study. This manuscript provided a comprehensive review of preschool bullying, including prevalence, measurement, definition, development, risk factors, and protective factors. From the framework of the social ecological model and social ecological diathesis stress model, we aimed to understand how bullying develops in preschool, and how it presents amongst to contexts in which preschoolers exist. From the framework of SCT, we examined how cognitive and social skills develop in preschool aged children, and how this development is associated with engagement in aggression and bullying.

**Manuscript 2.** The second manuscript assessed youths' perceptions of themselves and their schools, and how these factors predicted their willingness to intervene when they witnessed bullying. Informed by the social ecological model, we hypothesized that microsystemic and mesosystemic perceptions would influence individual actions of bystanders to bullying. Microsystemic factors included internalizing symptoms, externalizing symptoms, and previous victimization. Mesosystemic factors included students' perceptions of school connectedness and availability of services and resources. Additionally, bystander behavior development through the SCT lens could help explain why students join in on bullying. It is possible that students' reactions to witnessing bullying are informed by their environment (e.g., previous bullying experience) and that this environment then informs reactions (e.g., students who were previously bullied try to stay out of any bullying situations as a form of self-protection). We empirically examined these factors in relation to youths' involvement in assisting, defending, and outsider behavior patterns. We found that

externalizing behavior was strongly associated with acting as bully assister. Findings also revealed that having been previously victimized significantly predicted all three behavior response patterns, with the most salient finding related to victim defending. We also found that students who perceived more support from their school were more likely to defend the victim.

**Manuscript 3.** The third manuscript examined social cognitive and neuropsychological predictors of direct and indirect bullying. This empirical manuscript was heavily influenced by social cognitive theory and informed more broadly by social ecological theory. Within a social ecological framework, we examined factors at the individual level (i.e., social information processing, executive functioning) and at the microsystemic level (i.e., parent and teacher perceptions of behavior), and how those related to direct and indirect bullying. Given that bullying exists largely within the school context, mesosystemic influences were present in the study. From a social cognitive perspective, we examined underlying processes, including executive functioning and social information processing, that were hypothesized to play a role in direct and indirect bullying. Given the context of social development and neuropsychological development during middle school, we predicted that students with more negatively biased social information processing would be more likely to engage in direct and indirect bullying. We predicated that better executive functioning would be associated with more indirect bullying while poorer executive functioning would be associated with more direct bullying. Surprisingly, we found that better planning and reasoning was associated with higher levels of direct bullying. This finding supported work of Sutton and colleagues

(1999) which posited that some bullies may in fact have strong reasoning skills that they employ in bullying situations (Sutton, Smith, & Swettenham, 1999).

## Summary and Implications

Bullying is a dynamic behavior that changes over time. This behavior can start to develop as early as the preschool years and continue into adulthood and the presentation of bullying changes as youth develop. As such, it is important to study bullying in different developmental phases and in different contexts. There are robust findings in the literature on adjustment problems associated with bullying in youth from early childhood through late adolescence. However, there are significant gaps in the literature during certain periods in development. Additionally, studies often lack nuance in examining potential processes that may underlie bullying. Moreover, much of the literature on bullying relies on self-report data.

This dissertation aimed to address these gaps across the three manuscripts. The first manuscript contains a comprehensive review of the preschool bullying literature. This paper examined how bullying in preschool differs from bullying in subsequent phases of development, and provides implications for measurement and interventions that are developmentally sensitive. Given the shift in importance from family to peer relationships that occurs in middle school, the second manuscript examined individual and school associations with bystander behavior. This second study summarized novel findings that provide implications for bystander intervention, which is particularly helpful in reducing bullying in middle school. Lastly, the third manuscript examined the processes of executive functioning and social information processing, and how these processes were associated with direct and indirect bullying. Through the use of

performance measures of social information processing and executive functioning, this study helped shed light on processes that may underlie bullying behavior. This has important implications in terms of targeting specific processes for intervention.

An important aspect of each study was the implications for intervention and prevention efforts. Through comprehensive literature review and empirical work, findings provide general and specific directions for policy makers, teachers, administrators, researchers, and the like. This line of research is unique in that multiple stages of development were considered, thus providing information about reducing bullying through multiple lenses. Future studies will leverage these findings and extend this line of research to consider bullying across the life course (Bradshaw, 2017).

References

Baldry, A. C. (2003). Bullying in schools and exposure to domestic violence. *Child Abuse & Neglect*, *27*(7), 713-732.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, *50*(2), 248-287.

Bandura, A. (2011). Social cognitive theory. *Handbook of social psychological theories*, *2012*, 349-373.

Bistrong, E., Bottiani, J. H., & Bradshaw, C. P. (2019). Youth reactions to bullying: Exploring the factors associated with students' willingness to intervene. *Journal of School Violence*, 1-14. DOI: 10.1080/15388220.2019.1576048

Bowes, L., Arseneault, L., Maughan, B., Taylor, A., Caspi, A., & Moffitt, T. E. (2009). School, neighborhood, and family factors are associated with children's bullying involvement: A nationally representative longitudinal study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *48*(5), 545-553.

Bradshaw, C. P. (Ed.). (2017). *Handbook on bullying prevention: A life course perspective*. NASW Press: New York, NY.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 513–531.

Centers for Disease Control and Prevention. (2018). BRFSS: Behavioral Risk Factor Surveillance System. Retrieved from http://apps.nccd.cdc.gov/BRFSS/.

Cicchetti, D., & Toth, S. L. (1998). The development of depression in children and adolescents. *American Psychologist*, *53*, 221–241. http://dx.doi.org.proxy.its.virginia.edu/10.1037/0003-066X.53.2.221

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135-168.

Gladden, R. M., Vivolo-Kantor, A. M., Hamburger, M. E., & Lumpkin, C. D. (2014). *Bullying surveillance among youths: Uniform definitions for public health and recommended data elements*. CDC and USDOE: Atlanta, GA.

Kann, L., McManus, T., Harris, W. A., Shanklin, S. L., Flint, K. H., Queen, B., ... & Lim, C. (2018). Youth risk behavior surveillance—United States, 2017. *MMWR Surveillance Summaries*, *67*(8), 1-114.

Ialongo, N. S., Vaden-Kiernan, N., & Kellam, S. (1998). Early peer rejection and aggression: longitudinal relations with adolescent behavior. *Journal of Developmental and Physical Disabilities*, *10*(2), 199-213.

Lazarus, R. S. (1993). Coping theory and research: Past, present, and future. *Fifty years of the research and theory of RS Lazarus: An analysis of historical and perennial issues*, 366-388.

Lutgen-Sandvik, P., Tracy, S. J., & Alberts, J. K. (2007). Burned by bullying in the American workplace: Prevalence, perception, degree, and impact. *Journal of Management Studies*, *44*(6), 837-861.

Orpinas, P., & Horne, A. M. (2006). *Bullying prevention: Creating a positive school climate and developing social competence*. American Psychological Association.

Miller, N., Dollard, J.. (1941). *Social learning and imitation*.

Moffitt, T. E. (2006). Life-course-persistent versus adolescence-limited antisocial behavior. In D. Cicchetti, Cohen, D. J. (Ed.), *Developmental Psychopathology* (Vol. 3, pp. 570-598). Hoboken, NJ: John Wiley & Sons.

Monks, C., Ortega Ruiz, R., & Torrado Val, E. (2002). Unjustified aggression in preschool. *Aggressive Behavior, 28*(6), 458-476.

Monks, C. P., Smith, P. K., & Swettenham, J. (2005). Psychological correlates of peer victimisation in preschool: Social cognitive skills, executive function and attachment profiles. *Aggressive Behavior, 31*(6), 571-588.

Monks, C. P., & Smith, P. K. (2006). Definitions of bullying: Age differences in understanding of the term, and the role of experience. *British Journal of Developmental Psychology, 24*(4), 801-821.

Monks, C. P., Smith, P. K., Naylor, P., Barter, C., Ireland, J. L., & Coyne, I. (2009). Bullying in different contexts: Commonalities, differences and the role of theory. *Aggressive and Violent Behavior, 14*, 146–156.

Mouttapa, M., Valente, T., Gallaher, P., Rohrbach, L. A., & Unger, J. B. (2004). Social network predictors of bullying and victimization. *Adolescence, 39*(154), 315-335.

Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. *Jama*, *285*(16), 2094-2100.

National Academies of Sciences, Engineering, and Medicine. 2016. *Preventing Bullying Through Science, Policy, and Practice*. Washington, DC: The National Academies Press. https://doi.org/10.17226/23482.

Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Malden: Blackwell Publishing.

Pepler, D. J., & Craig, W. M. (1995). A peek behind the fence: Naturalistic observations of aggressive children with remote audiovisual recording. *Developmental Psychology, 31*(4), 548-553.

Pozzoli, T., & Gini, G. (2010). Active defending and passive bystanding behavior in bullying: The role of personal characteristics and perceived peer pressure. *Journal of Abnormal Child Psychology, 38,* 815–827.

Sharp, S., & Smith, P. (2002). *School Bullying: Insights and Perspectives*. Routledge.

Sutton, J., Smith, P. K., & Swettenham, J. (1999). Bullying and 'theory of mind': A critique of the 'social skills deficit' view of anti-social behaviour. *Social Development, 8*(7), 117-127.

Swearer, S. M., & Hymel, S. (2015). Understanding the psychology of bullying: Moving toward a social-ecological diathesis–stress model. *American Psychologist, 70*(4), 344-353.

Swearer, S. M., Wang, C., Berry, B., & Myers, Z. R. (2014). Reducing bullying: Application of social cognitive theory. *Theory into Practice, 53*(4), 271-277.

Vlachou, M., Andreou, E., Botsoglou, K., & Didaskalou, E. (2011). Bully/victim problems among preschool children: A review of current research evidence. *Educational Psychology Review, 23*(3), 329-358.

**Manuscript 1**

# Understanding Bullying Among Preschool-Aged Children

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Abstract

Bullying is a behavior that is salient across the lifespan and is associated with a variety of negative outcomes for children who are involved as victims, perpetrators, and witnesses of bullying behaviors. While there has been considerable interest in bullying prevention programming, most of the extant research has focused on school-aged children, with relatively limited attention given to bullying in early childhood. Yet, there is considerable research indicating that aggressive behavior problems in early childhood are associated with a range of short- and long-term outcomes for youth. As such, there is increasing concern about bullying as a particular form of aggressive behavior that may also affect preschool-aged children. The current chapter summarizes what is known and unknown about bullying and bullying prevention among preschool-aged children. Having an enhanced understanding of the developmental roots of bullying in early childhood may further inform professional development for educators and family-focused programming aimed at reducing risk factors and bolstering protective factors for involvement in this potentially harmful behavior in early childhood.

## Understanding Bullying Among Preschool-Aged Children

While bullying continues to be a topic of national conversation and of increased attention in the scholarly literature, much of the research on bullying has focused on school-aged children (Juvonen & Grahm, 2001; Monks, Smith, & Swettenham, 2005; Ostrov, Blakely-McClure, & Kamper, 2017; Vlachou, Andreou, Botsoglou, & Didaskalou, 2011). Yet, there is increasing interest in this issue among younger children (i.e., those under age eight). In fact, there is considerable evidence that peer victimization and aggressive behavior in early childhood are associated with a host of problematic outcomes (e.g., academic, emotional, and behavioral problems), in both the short- and long-term (Ialongo, Vaden-Kiernan, & Kellam, 1998; Lober et al., 2003; Moffitt, 2006). However, relatively few studies have focused more narrowly on 'bullying' (c.f., Arseneault et al., 2006; Perren & Alsaker, 2006; Vlachou et al., 2011), which is defined as a particular form of aggressive behavior which is intentional, likely to be repeated over time, and occurs in the context of a power differential (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014; Olweus, 1993).

Nevertheless, group daycare settings and preschools are often the first social environment where children regularly interact with multiple peers; this provides the opportunity and context for development of social skills, as well as the opportunity for bullying to occur (Vlachou et al., 2011). Yet, it is likely that bullying among preschoolers differs from bullying among older students, due in large part to a host of developmental considerations (e.g., emotional regulation, self-control, social and cognitive abilities,

perspective taking skills), which impact preschool children's aggressive tendencies and interactions with peers (Coie & Dodge, 1998). Some may even question whether bullying truly occurs in early childhood, or if the behavior is more appropriately conceptualized through a broader lens of aggression and peer victimization.

The current chapter summarizes what is known and unknown about bullying among preschool-aged children (children approximately three to four years old). Understanding the nuances of bullying among preschool-aged children has important implications for child development research and the creation of developmentally-appropriate intervention and prevention approaches. We begin by considering the application of traditional definitions of bullying to the preschool population. We then explore the complications associated with measuring bullying in preschoolers and how measurement concerns impact research on prevalence rates, risk factors, and correlates of bullying involvement. We also review several assessments that research suggests are developmentally-appropriate for assessing bullying in early childhood. We reflect on developmental theories and the broader literature on aggression and peer victimization, and the extent to which this literature may generalize to preschoolers' involvement in bullying more specifically. We conclude the chapter by discussing the implications of this research for prevention and early intervention. We also identify several areas that warrant further study.

**How Well Does the Term "Bullying" Apply to Preschoolers' Aggressive Behavior?**

Olweus (1993) put forth a widely-accepted definition of bullying which includes "aggressive behavior of intentional harm doing, which is carried out repeatedly and over time in an interpersonal relationship characterized by an imbalance of power" (p. 3). This

conceptualization suggests that bullying often occurs without provocation and may occur through physical (e.g., kicking, punching, hitting), verbal (e.g., name calling), and social (e.g., purposeful exclusion from peer groups, rumor spreading) means. However, bullying in the preschool years may operate under a slightly different definition. For example, with regard to intentionality, preschoolers do not yet have the cognitive abilities related to intentionality (e.g., perspective taking, ability to manipulate, theory of mind, social skills) suggested by Olweus' definition. In fact, some researchers have considered preschool bullying as unjustified aggression in an effort to incorporate the fluid nature of social skills displayed among younger children (Kochenderfer & Ladd, 1997; Monks, Ruiz, & Val, 2002). Whereas school-aged children's victimization of others is often motive-driven (e.g., target a certain student for a specific reason, want to make them look bad in front of others), many preschoolers bully other students with no apparent motive. Moreover, since many preschool-aged youth have not yet established prosocial behaviors (e.g., sharing toys, engaging in cooperative play), they may engage in aggressive behaviors to obtain access to a tangible object (e.g., toy, activity) or to gain peer or adult attention (Rose et al., 2014). Preschoolers may bully multiple students, rather than targeting specific 'vulnerable' peers; however, children who bully may learn over time which of their peers are most reactive, and thus may begin to repeatedly target particular children (Kochenderfer & Ladd, 1996; Monks et al., 2002). While we begin to see repeated victimization in preschool, this repeated victimization does not take place over an extended period of time, which also differentiates it from bullying often displayed by school-aged youth (Monks et al., 2002).

This targeting of other children also pertains to the repeated element of the Olweus' definition, as research suggests that preschool children are more likely to experience short periods (e.g., one day, one week) of victimization rather than the repeated victimization (e.g., over the course of several school years) characteristic of middle childhood and adolescence. Researchers theorize that low stability of victimization occurs because preschool-aged children, upon exposure to a novel peer group such as the classroom setting, may display aggressive behavior toward numerous students (Perry, Perry, & Boldizar, 1990). Over time, preschoolers learn to target their aggressive behavior toward certain children, a decision informed by the reactions of the victims of their initial and widespread aggression (Björkqvist, Österman, & Kaukiainen, 1992; Card et al., 2008). For example, a preschooler would be more likely to bully the same victim again if the victim reacted by getting upset and throwing a tantrum. Conversely, a preschooler may be less likely to repeatedly victimize a child who simply walked away when aggressed upon (Monk et al., 2005; Perry et al., 1990). Another developmental factor regarding victim instability involves preschool students' limited ability to conceptualize and understand the behavior of their peers. Unlike older children, preschool children have difficulty identifying the vulnerable behaviors (e.g., submissive/withdrawn behaviors) in their victims that often lead to repeated victimization (Hanish & Guerra, 2000).

Preschoolers also have a different conceptualization of the term bullying and the behaviors that constitute bullying. For example, research suggests that preschool-aged children hold a more simplistic view of the victimization experience than their older peers. For example, most preschoolers will categorize a behavior as either bullying or not

bullying, but are unable to distinguish the type of bullying behavior. Older children are better able to distinguish between different forms of bullying such as physical, verbal, and cyber (Smith, Cowie, Olaffson, & Liefooghe, 2002). Moreover, when categorizing a behavior as bullying, preschoolers do not take into consideration issues of power differential, repetition, or intentionality, which is inconsistent with Olweus' (1993) definition of bullying. Despite preschoolers' limited capacity to categorize and understand their own bullying behavior, observational research shows that these children do engage in many forms of bullying, including physical, verbal, and social forms of bullying.

In summary, preschoolers engage in a relatively high rate of aggressive behavior, in large part because they lack social and emotion regulation skills and the ability to use adaptive ways to cope with frustration and resolve interpersonal conflict. Yet, some of these behaviors may constitute bullying, if we use a slightly adapted definition of the behavior. It may be helpful to still use this conceptualization, but acknowledge the developmental context in which it occurs. Perhaps it is not until children are in middle childhood and possess a theory of mind and enhanced social-cognitive skills that they are truly engaging in bullying that fully meets all the definitional elements conceptualized by Olweus (Monks & Smith, 2006).

**What Does Bullying Look Like in Preschoolers?**

Observational data and parent and teacher reports of bullying among preschoolers generally suggest that preschoolers can engage directly and indirectly in aggression, and that most bullying among preschoolers takes the following forms: physical aggression, verbal aggression, and social aggression (Alsaker & Gutzwiller-Helfenfiner, 2010; Crick

& Ostrov, 2006). Most often, younger children tend to bully peers using largely observable forms of bullying behaviors, which includes verbal, physical, and relational (e.g., social exclusion) forms (Alsaker & Gutzwiller-Helfenfinger, 2010; Crick & Grotpeter, 1995; Crick, Ostrov, Burr, Cullerton-Sen, Jansen-Yeh & Ralston, 2006). More specifically, direct physical aggression in preschoolers includes behaviors that involved inflicting physical harm upon another student (e.g., hit a student who does not share a toy). Direct forms of relational aggression in preschoolers include behaviors that targeted a relationship in a manner that was easily observed. For example, a preschooler may say to a peer, "If you don't share your toys with me, I will not be your friend anymore" or "I am not going to invite you to my birthday party," which are both examples of direct relational aggression. Additionally, a preschooler may simply hit another child who did not share with him or her. As children age, we see an increase in their use of more indirect forms of aggression (e.g., spreading a rumor about a peer following a transgression) that require more advanced social cognitive skills (Sutton, Smith, & Swettenham, 1999). In summary, preschoolers typically use more direct forms of aggression that are usually more focused on the individual rather than the group (e.g., calling an individual student a mean name, rather than spreading a rumor in hopes to turn a group of students against another student [Monks et al., 2002; 2003; 2005]). This delineation in behavior may be attributed to a preschooler's limited ability to take another's perspective, an aspect of their development of theory of mind (Sutton et al., 1999), as described in greater detail below.

**How is Bullying Measured among Preschoolers?**

Understanding the way in which preschool bullying differs from bullying in older children has important implications for measuring this behavior in the preschool population. As such, the assessment and measurement of bullying among preschoolers poses some unique challenges.

**Self-report and peer-report.** In school-aged children, self- and peer-report measures are often collected to examine this behavior (Alsaker & Valkanover, 2001; Kochenderfer & Ladd, 1996). There are various roles that students can assume in bullying interactions: the bully, the victim, and the bully-victim. They may also assume a bystander role such as reinforcer, assister, or outsider. Self-report data by preschoolers should be interpreted with some caution, as these children may not be capable of recognizing the behavior and reporting on it (Alsaker, 1993; Vlachou et al., 2011). Research suggests that preschool-aged children are capable of identifying peers as being a bully, victim, and defender (e.g., actively stops the bullying, comforts the victim), but they appear to be less adept at identifying classmates who play other roles in bullying situations, such as assisters (e.g., joins in on the bullying, laughs at the victim) or outsiders (e.g., witnesses the bullying and walks away; Monks et al., 2003). These findings are consistent with the research summarized above regarding preschoolers' view of aggression in more simplistic terms (e.g., bullying or not bullying), rather than being able to decipher the nuances of various forms and roles.

More recent studies have examined preschoolers' ability to provide reliable self-report data when different measurement and assessment tools are used. While it may be tempting to just read aloud self-report measures designed for older students to preschoolers, they may not be appropriate for preschoolers due to developmental

considerations such as cognitive (e.g., theory of mind, language development), social (e.g., perspective taking), and linguistic abilities. One such tool for assessing preschoolers' perceptions of the different roles in bullying situations, such as victim, perpetrator, and defender is the Preschool Social Behavior Form (Alsaker & Nagele, 2008). Additionally, sociometric protocols can be adapted for a younger population in order to collect peer reports of bullying (for a discussion of these adaptations, see below for some specific instruments for measuring bullying among preschoolers). In summary, preschoolers can be reliable self-reporters of bullying roles in the classroom when assessment and measurement tools are sensitive to their developmental level (Alsaker & Nagele, 2008)

**Teacher-report.** Because of the concerns associated with the use of self-reports of bullying among preschoolers, many researchers rely more heavily on teacher-reports of preschool bullying (Crick et al., 1999). Yet, there are also challenges in collecting valid and reliable data from preschool teachers regarding bullying behaviors. For example, teachers may have trouble discriminating general aggression (e.g., throwing a temper tantrum, yelling) from bullying (e.g., yelling at another student) among preschoolers (Alsaker, 2003). This may be particularly challenging in light of the relatively high base rate of aggressive behaviors occurring among children this age (Coie & Dodge, 1998).

Developmental considerations, specifically emotional regulation and self-control, contribute to this more widespread aggression. It may be difficult for a teacher to discern whether an instance of aggression occurs because of a preschooler's inability to control their emotions (e.g., throwing a tantrum when a toy was taken away from them) or

because they felt anger towards a particular peer (e.g., hitting another student who would not share with them). Furthermore, teachers may be reluctant to identify and label student behavior as bullying, because of the negative connotation associated with the term and the intentionality implied (Alsaker, 2003).

**Observational data.** Observational data also play an important role in the measurement and assessment of preschool-aged bullying (Crick et al., 1999), especially given the limited abilities of preschoolers to provide reliable self-report data. This form of data collection provides researchers with information on preschool bullying from an unbiased perspective, differentiating it from teacher collected and self-report data (Crick et al, 1999; Ostrov, Kamper, Blakely-McClure, Faracca, & Godleski, 2017). As noted above, bullying in preschoolers typically occurs in a direct manner, which more easily observed for the purposes of observational research (MeEvoy et al., 2003; Ostrov, Kamper et al., 2017). Observational data are often collected using live ratings (i.e., trained and unbiased assessors) or video cameras and microphones on playgrounds and in classrooms. These data are coded based on observed instances of physical and relational aggression in these young children (e.g., Godelski et al., 2014; Pepler & Craig, 1995; 1997). Studies on the use of observational data collection in the preschool setting revealed that the naturalistic setting of data collection is advantageous, but they are also limited in that only observable behaviors can be coded (Godelski et al., 2014).

**Other raters and settings.** Although an understudied area, parent-reports can also provide some information on bullying and peer-victimization (Waasdorp, Bradshaw, & Duong, 2011). Again, much of the extant work in parent reports of bullying has occurred in reference to school-aged children, but parents may also be knowledgeable

about their preschool-aged child's involvement in bullying, either through disclosure from the child or teacher, or through their own direct observation. Parent reports may be particularly informative for studying bullying that occurs outside of school settings, such as on community playgrounds or in the home among relatives (e.g., siblings, cousins, neighbors; Tucker, Finkelhor, Turner, & Shattuck, 2013). Such forms of bullying have rarely been considered in the literature, perhaps due to measurement challenges. However, emerging evidence suggests that they can be extremely prevalent and associated with problematic outcomes for the target and the aggressor (see Tucker et al., 2013). This highlights the growing need for validated parent-report measures of bullying.

**Specific instruments for measuring preschool bullying.** Given developmental considerations, it is likely and logical that preschoolers require different self and peer report measures than their older counterparts. The Centers for Disease Control and Prevention (CDC) created a compendium, which consisted of a comprehensive review of bullying literature that yielded various instruments to measure and assess involvement in bullying. Review of the compendium illustrates the need for more research in the area of measurement of early childhood aggression, as no instruments in the compendium specifically targeted preschool children (Hamburger, Basile, & Vivolo, 2011). However, one of the measures assesses behavior in 5-6 year olds: the Child Behavioral Scale (Ladd & Profilet, 1996). This scale includes 17 teacher rated items of various student behaviors (i.e., aggression with peers, prosocial behavior with peers, asocial behavior with peers, exclusion behavior among peers, anxious-fearful behavior, and hyperactive-distractible behavior) and forms two scales: Aggressive with Peers ($\alpha$= .77) and Prosocial with Peers ($\alpha$ =.93). While the age group studied was slightly older than preschool age, these

findings suggest promise for the Child Behavioral Scale for use with preschoolers (Ladd & Profilet, 1996).

The Preschool Social Behavior Scale-Teacher Form is another research-based measure that has been used to assess aggressive and delinquent behaviors in preschool children. This measure yields four scales: relational aggression (α =.96), overt aggression (α =.94), prosocial behavior (α =.88), and depressed affect (α =.87; Crick, Casas, & Mosher, 1997). The peer form of the Preschool Social Behavior Scale (PSBS-P) has been used to assess relational and overt aggression and prosocial behavior in preschoolers. This measure provides three scales: relational aggression (α =.71), overt aggression (α =.77), and prosocial behavior (α =.68; Crick et al., 1997). When used in conjunction with each other, these teacher and peer forms can provide researchers and clinicians with insight into various forms of bullying (Ostrov & Keating, 2004). Lastly, ratings of sociometric status by peers and teachers are a sound way to collect data on this population. This type of data collection involves teachers assigning a rating of each student's social dominance and peer acceptance. For peer sociometric ratings, children are typically shown their class picture and asked to nominate the three children with whom they would most prefer to play, or other such ratings (e.g., nominate children who bully others; Ostrov & Keating, 2004).

The collection of data from multiple sources (e.g., observational data, teacher reports, peer reports, sociometric ratings) can provide insight into the way that bullying occurs in early childhood. Using a multi-informant approach is important, as preschoolers may not always be reliable self-reporters on their own bullying behavior. Incorporating data from other informants such as parents, observers, and teachers can give us a more

complete picture of bullying at this age. Different informants provide researchers with diverse perspectives of aggressive behaviors, and how to conceptualize these behaviors in terms of bullying. Given the way that preschoolers view bullying, measurement of this behavior is inherently more challenging; future research should determine how to incorporate developmental considerations (e.g., perspective taking, cognitive abilities, vocabulary) into protocols.

**How Prevalent Is Bullying In Preschoolers?**

As noted above, there are several challenges to collecting valid and reliable information on bullying among preschoolers, which in turn limits our understanding of its prevalence among preschool-aged children. However, children this age do display generally high base rates of aggressive behavior, a large proportion of which would likely be considered bullying (Coie & Dodge, 1998; Crick et al., 1999; Hanish, Kochenderfer-Ladd, Fabes, Martin, & Denning, 2004; Ladd & Ladd, 1998; Monks et al., 2005). One of the most widely-cited studies in this area draws upon observational data collected via video cameras and microphones on preschool playgrounds and classrooms (Pepler & Craig, 1995). This study suggested that bullying behaviors occur about every seven minutes, with each instance lasting a very short amount of time.

Another study which provides some insight on prevalence of bullying among young children was conducted by Monks and colleagues (2005), who collected sociometric data from preschoolers ($n$=104); their research revealed that 25% of children were aggressors, 22% of children were victims, 16% of children were defenders, 5% of children were both defenders and victims, and 2% of students were both aggressors and victims. The remaining 30% of students were not identified by their peers as playing a

role in the bullying interchange (Monks et al., 2005). These data also showed that preschoolers were most likely to identify aggression and victimization displayed by their peers through direct ways, including physical and verbal methods of aggression (Monks et al., 2005). While there are many factors to consider when interpreting these findings, such as role stability and the nature of self-report data, these data do suggest a relatively high rate of bullying among preschoolers.

**What Roles Do Preschoolers Play in Bullying?**

Although preschoolers may operationalize bullying as aggression in a broad sense (Monks et al., 2005; Smith et al., 2002; Smith & Levan, 1995), they likely play different roles in the dynamic, such as aggressor, defender, victim, bully-victim, outsider, assister, and reinforcer (Monks et al., 2005; Vlachou et al., 2011). However, as noted above, the stability of these roles varies considerably among preschoolers, particularly as compared to school-aged children. For example, in school-aged children the role of the victim tends to be stable where victims continue to be victimized over long periods of time. Conversely, preschoolers are not as consistent in terms of whom they victimize. Preschoolers may be experimenting with their new social context and developing a schema for how they fit into their social world. As such, these children may periodically act aggressively or exclusionary, in order to assess how these behaviors impact their experience in the classroom. These typically short 'experiments' with different roles and behaviors translate into bullying roles that are not as stable when compared to school-aged children (Hanish et al., 2004). Of the various roles, the aggressor role tends to be most stable among preschoolers (Ladd & Burgess, 1999; Monks et al., 2003). The

defender role (e.g., comforts the victim, confronts the bully) was moderately stable, whereas the victim role was the least stable (Monks et al., 2003).

**Are There Gender Differences Bullying Among Preschoolers?**

Research consistently finds that, among preschoolers, boys display more aggressive behavior than girls; however, boys are more likely to be physically victimized whereas girls are more likely to be relationally victimized (Monks et al., 2005; Scheitauer & Petermann, 2002). This trend continues through elementary school, but by adolescence, both boys and girl tend to engage in similar rates of relational aggression (Card, Stucky, Sawalani, & Little, 2008; Crick, Casa, & Ku, 1999; Ostrov, Woods, Jansen, Casas, & Crick, 2004). Preschoolers typically play and socialize in groups that are segregated by gender, which may help explain the delineation between girls and boys (Macoby, 1988; Rubin, Bukowski, & Parker, 1998). With regards to verbal forms of aggression, preschool-aged girls and boys tend to engage in this behavior equitably (Crick et al., 1999). The literature is rather consistent in terms of the types of bullying in which male (i.e., physical) and female (i.e., relational) preschoolers participate, suggesting that these types remain consistent in preschool years.

It is also important to consider gender differences in the ways in which preschoolers experience bullying, particularly in reference to relational aggression (Morin & Bradshaw, 2017). One hypothesis is that females' experiences with relational aggression in preschool may lead them to rely on maladaptive behaviors, such as manipulation, in order to successfully navigate a social situation. This trend may then continue into the school years. Boys may experience increased relational aggression in grade school, as they begin to socially interact with girls more often. The exposure to

relationally aggressive behavior in their interactions with females could contribute to its more frequent use among males in grade school. In other words, as boys and girls begin to interact more often, their bullying behaviors become more similar (Crick et al., 1999).

**How Does Bullying Develop in Early Childhood?**

In understanding bullying among preschoolers, we draw upon various developmental theories and empirical evidence that provide further insight into various dimensions of this behavior. Using a developmental lens, we can conceptualize bullying as a behavior which progresses and changes in both form and function. The behavior begins as direct and largely physical in nature, but as youth enter elementary school, they begin to engage in more relational and indirect forms of bullying (Monks et al., 2005). The enhanced social, cognitive, and linguistic skills developed as youth transition from early childhood into middle and late childhood enable them to express aggression in a more sophisticated manner. The delineation in experiences between preschoolers and older children exists within the way these two groups operationalize bullying (Bjorkqvist, 1994, Bjorkqvist, Osterman, & Kaukiainen, 1992; Lagerspetz, Bjorkqvist, & Peltonen, 1988; Vlachou et al., 2011).

Understanding the development of theory of mind in preschoolers can help frame our understanding of how bullying develops in this population. Theory of mind refers to our ability to conceptualize the behavior of others based on their knowledge and beliefs (Frith & Frith, 2005; Piaget, 1932). Children typically develop theory of mind around the age of five (Piaget, 1932). An example of a developed theory of mind would be a child who can think to themselves, “I know what he/she is thinking or feeling”. As such,

preschoolers do not typically have a fully developed theory of mind, which limits their capacity to take other's perspectives (Frith & Frith, 2005).

Developmental research by Piaget can also inform our understanding of cognitive differences in younger children's conceptualization of bullying. Piaget characterized preschool children as being pre-operational, suggesting a tendency to focus more on the outcome of a situation rather than the intent (e.g., you hit me vs. you hit me intentionally vs. you hit me accidentally; Piaget 1932, 1977; Vlachou et al., 2011). Vlachou et al. (2011) further purported that with age, children gain the ability to understand situations with more complexity and organize their cognitions around outcomes, as well as intent (e.g., you excluded me from lunch because I did not share with you). In fact, research on preschoolers' ability to distinguish types of deviant behavior suggests that younger children are often unable to use more than one dimension (e.g., outcome, intention), making them more likely to view bullying in terms of aggressive behavior in a broad sense (e.g., view the act of being hit the same regardless of victimization status; Younger, Schwartzman, & Ledingham, 1986).

Furthermore, during the preschool years, children develop social skills that allow them to make and maintain friendships and build consistent peer and play groups. Reputations start to become conceptualized in these children, where consistent ideas are formed about specific students (e.g., Betty is mean; Rubin & Coplan, 1998, Strayer & Santos, 1996; Vlachou et al., 2011). By the later preschool ages and early kindergarten ages of 5-6, certain aspects of social interplay are more likely to become crystallized. Constructs such as friendships and peer groups begin to stabilize at this age. Logically following this finding, these older preschoolers begin to spend more time socializing and

playing with their new friends and peer groups and less time engaging in solitary play (Rubin & Coplan, 1998; Strayer & Santos, 1996; Vlachou et al., 2011).

Another developmental consideration in preschoolers is their emerging skills related to emotional and behavioral regulation, as preschoolers often have difficulty inhibiting aggressive responses to provocation and can 'fly off the handle' rather quickly when there is a goal block or perceived threat or injustice (Arsenio & Lemerise, 2004; Cummings et al., 1989; Salmivalli, Ojanen, Haanpää, & Peets, 2005; Vlachou, 2011). Hanish and colleagues (2005) further explored this issue and found that the development of reputations was associated with preschoolers' increased likelihood of displaying direct aggression based on reputation (Hanish et al., 2005). In other words, as these reputations are formed, preschoolers are more likely to be victimized based on these newly conceptualized reputations (e.g., a student is excluded from a group activity because she is known as a 'cry baby'). The limited self-control, poor emotion regulation, and lack of effective conflict resolution also likely contribute to this negative dynamic. Taken together, these developmental changes within children and their peer groups are important and have significant implications for preschool-aged children's involvement in and reactions to bullying.

**What are Common Risk Factors and Protective Factors of Preschool Bullying?**

**Risk factors.** Research on bullying has taken a particular interest in the characteristics and behaviors that increase children's likelihood for involvement in bullying. Certain aspects of preschoolers' development and functioning may increase their risk of bullying others or being victimized by others. For example, researchers found that victims of both relational and physical victimization in preschool often

displayed behaviors interpreted as vulnerability (e.g., internalizing problems), which further increased risk for victimization (Ostrov, Murray-Close, Godleski, & Hart, 2013). Social cognitive skills (e.g., perspective taking), executive functioning skills (e.g., reasoning, planning), and attachment profiles (e.g., quality of the relationship between the child and primary caregiver) were associated with the roles of the aggressor, defender and victim, respectively, in the preschool context (e.g., more advanced perspective taking skills and executive functioning positively correlated with defending behavior; Monks et al., 2005).

Difficult relationships within the peer group and low peer status put preschoolers at risk for being physically or relationally victimized, as aggressors may assume these victims are unable to protect themselves or have friends willing to intervene on their behalf (Crick et al., 1999). Conversely, repeated victimization can put a child at risk for losing other friendships, given they may develop a reputation as being of low social status (Boulton & Underwood, 1992; Perren & Alsaker, 2006; Vlachou et al., 2011). This pattern of risk factors with regard to friendships may perpetuate itself, thus is important to consider the social dynamics that increase preschoolers' likelihood of becoming victims.

Preschoolers' behavioral and temperamental characteristics may also contribute to their risk of being victimized. The behavioral tendencies associated with preschool victims, such as high anxiety, physical reactivity, and irritation toward others elicited negative reactions from peers (Griffin & Gross, 2004). Due to these negative reactions, victims are more likely to experience peer rejection and behave anxiously, thus perpetuating a transactional relationship (Perren & Alsaker, 2006). Furthermore,

children's experiences with bullying and aggression in early childhood significantly increase the risk for later peer victimization (Godleski, Kamper, Ostrov, Hart, & Blakely-McClure, 2015). In terms of temperament, some preschool-aged victims are often reactive, irritable, and hot-tempered (Perren & Alsaker, 2006). These characteristics have been linked with increased instances of victimization and higher likelihood of reacting aggressively when victimized. These temperamental traits observed in preschool victims may also increase the likelihood of victimization, as their peers often view their behavior negatively. These negative views, in turn, may lead some preschoolers to act aggressively toward other temperamental and impulsive students (Orpinas & Horne, 2006; Vlachou et al., 2011).

Various social interactions have been linked with preschooler's likelihood of assuming the role of the bully or aggressor. Preschoolers who bully or are aggressive are typically involved in a peer network and have a large number of friends (Perren & Alsaker, 2006; Vlachou et al, 2011). These findings are consistent with the literature in older children who bully, as they too generally operate within larger peer networks and do not lack in friends as compared to their peers (Boulton, 1999; Pellegrini, Bartini, & Brooks, 1999; Vlachou et al., 2011). While these findings do not speak to how well-liked these students are, they do imply that classmates accept these students into peer groups. However, higher levels of social aggression in the preschool child's social context increase their risk of engaging in social aggression. For example, peers may witness this form of aggression, which in turn may facilitate its development and shift the group norm to a more aggressive one within that particular peer context (Bjorkqvist et al., 2002; Tremblay et al., 2004; Vlachou et al., 2011).

There may also be subpopulations of children who are particularly vulnerable to involvement in bullying. For example, preschoolers with disabilities (e.g., developmental delays in their cognitive processing, poor social problem solving, emotional regulation problems, and language and communication acquisition challenges) are at increased risk for peer victimization (Odom et al., 2006; Rose, Monda-Amaya, & Espelage, 2011). There is some evidence to suggest that the social, cognitive, and emotional challenges affecting these students' social competence makes them both vulnerable to victimization and less adept at coping with the victimization (Diamond, 2002; Guralnick, 2010).

The sibling relationship also provides another potential context for bullying. Tremblay and colleagues found that the presence of a sibling was a stronger predictor of aggression in early childhood as compared to risk factors such as maternal age at birth, smoking during pregnancy, low income, and single parent households (Tremblay et al., 2004). Ensor and colleagues (2010) further explored this dynamic by comparing how older siblings behaved toward their younger siblings at two different time points (i.e., older siblings age three, older siblings age six), and then compared how these older siblings behaved toward a peer at age six. Their results showed that antisocial behavior toward younger siblings predicted bullying behavior toward peers at age six (Ensor, Marks, Jakobs, & Hughes, 2010). Their findings regarding siblings and preschool bullying shed light on this population, as aggression between siblings appears to be a significant risk factor for bullying in preschool years and beyond (Vlachou et al., 2011). Furthermore, poor parental supervision and modeling of aggressive behaviors can increase children's risk for involvement in bullying and other forms of aggressive behavior (Moffitt, 2006). This line of research further highlights the significance of the

home environment as important context for considering potential risk factors for children's involvement in bullying.

Genetic and neurobiological factors can increase the likelihood that preschool students will be involved in bullying, and be impacted by victimization. For example, there is a long line of research focused on genetic factors contributing to physical aggression, particularly when a genetic vulnerability is coupled with a traumatic event such as child abuse (DiLalla, 2002; Foley et al., 2004; Moffitt, 2006; Rhee & Waldman, 2002). There has also been a more recent exploration into genetic contributions to bullying involvement (for a review, see Vallincourt et al., 2017). Furthermore, from a neurodevelopmental perspective, there is a vast body of literature showing that adverse childhood events (e.g., trauma, abuse, severe rejection), particularly those occurring during early childhood, can have devastating impacts on children's neurobiology, including brain functioning and cortisol regulation (Anda et al., 2006). These findings illustrate that bullying can in fact 'get under the skin' of children and impact their physiological and psychological development through multiple pathways.

**Protective factors.** Consistent with a social-ecological perspective on bullying (Swearer & Hymel, 2015), there are potential protective factors located at the child, peer, school, and family levels, and the interaction of factors across these levels. For example, having effective social, communication, and emotion regulation skills can protect some children from involvement in bullying, or help them cope with it when it does occur. The family and classroom context are important settings for trying to improve these skills and reduce opportunities for bullying to occur (Monks et al., 2003; Monks et al., 2005). Furthermore, parents can play an important role as a buffer for bullying and aggression

during the preschool years, and beyond. Research suggests that if a child is able to form a close bond with at least one primary caregiver, they are less likely to develop adverse outcomes when faced with difficult situations (Werner, 1995; Werner, Bumpus & Rock, 2010), such as being bullied or witnessing bullying. Moreover, Werner (1989) found parents can help children learn how to cope in a way that is autonomous, but also open to asking for help when needed (Werner, 1995).

Within the peer context, there has been growing interest in the role of defenders, as they represent a unique population in terms of their role in the preschool bullying dynamic. Monks et al. (2003, 2005) found that the defenders performed significantly better than aggressors on inhibitory control tasks, suggesting more advanced cognitive development in these youth. Defenders are also more socially skilled than aggressors, and appear to have social-cognitive insight that aids in defending behaviors (Monks et al., 2005). Their advanced social and cognitive abilities contribute to their ability to take other students' perspectives and empathize with others. As a result, it is not surprising that these students are more likely to try and stop the behavior from occurring.

**What are Common Correlates and Consequences of Preschool Bullying?**

It is often difficult to tease apart the risk factors, correlates, and immediate consequences of bullying behavior, due to challenges in determining order of events. For example, although internalizing symptoms have been found to predict victimization, the directionality of this association is unclear, as preschoolers may exhibit internalizing problems as a result of or a reaction to victimization (Troy & Sroufe, 1987; Crick et al., 1999). In terms of relational aggression, younger children may hurt other students by threatening the relationship or friendship. Over time, the same students may become

repeated targets of this form of relational aggression, which puts them at risk for subsequent adjustment problems (Crick et al., 1997; Crick et al., 1999). A particularly hostile school environment can further put a preschooler at a higher risk for the development of internalizing adjustment problems in later years. This environment may create situations in which the student is excluded from activities, resulting in additional exposure to relationally aggressive behaviors (Crick et al., 1999).

When we consider the vast literature on consequences of bullying, studies generally suggest that bullying in preschool predicts later problems such as school avoidance, peer rejection, and numerous detrimental mental health outcomes (Kochenderfer & Ladd, 1996; Vlachou et al., 2011). For example, Ostrov (2010) found that victimization in preschool was predictive of subsequent aggressive behavioral problems. A seminal study by Crick and colleagues (1999) found that school-aged victims of relational aggression experienced higher levels of adjustment problems as compared to victims of physical aggression. These findings emphasize the negative mental health outcomes associated with bullying among preschoolers, which map onto similar findings among school-aged students. However, it is important to consider the consequences of bullying that occurs during this developmentally sensitive period of preschool, as this is the time when children are just beginning to interact with peers, and learning to navigate social situations. As a result, chronic involvement in bullying may limit opportunities for prosocial skill development. In summary, there is a large and growing body of literature documenting a range of problematic consequences of bullying, for both children who bully and those who are victimized by bullying.

**How Can We Prevent and Intervene with Preschoolers Affected by Bullying?**

Although several studies of bullying prevention programs have been shown to be effective among school-aged children (see Bradshaw, 2015; Farrington & Ttofi, 2009), very few preschool-based bullying programs have been developed and rigorously tested for efficacy. One rare example of a program for preschool children is the Be-Prox Program, which aims to decrease bullying and victimization in the kindergarten classroom. Research also suggests that the Be-Prox Program may be effective among preschoolers as well (e.g., Alsaker, 2004). This program aims to provide teachers and instructors with the means to address bullying and victimization among their young students by focusing on group discussions that aim to facilitate mutual support and cooperation among consultants, teachers and parents. Effects of this intervention showed a modest decrease in victimization (Alsaker, 2004). Another example of a preschool-based program focused on bullying is the Early Childhood Friendship Project (ECFP), an eight-week program for preschoolers that includes puppet shows, activities, and reinforcement. Data collected from both teachers and outside observers indicated reductions in relational bullying in the overall sample, and reductions in both relational and physical victimization for girls in the intervention group relative to a control group (see Ostrov et al., 2009; Ostrov, Godleski, Kamper-DeMarco, Blakely-McClure, & Celenza, 2015).

Although there are relatively few programs for preschoolers that are specifically focused on bullying, there are several other evidence-based programs focused on promoting social-emotional learning and emotion regulation, which may reduce rates of bullying (Bradshaw, 2015). These programs address preschool-aged children's cognitive, linguistic, and social skills and promote development in these areas in relation to social-

emotional and behavioral outcomes. Some such programs, such as the Incredible Years Program, (Webster-Stratton, Reid, & Stoolmiller, 2008), the Chicago Parenting Program (Baydar, Reid, & Webster-Stratton, 2003), and the Promoting Alternative Thinking Strategies program (Domitrovich, Cortes, & Greenberg, 2007), include parent- and/or teacher-focused activities. Other programs that focus on behavioral expectations and teacher behaviors have demonstrated positive impacts in early childhood settings. For example, early-childhood models based on the Positive Behavioral Interventions Supports (PBIS) framework have demonstrated effects on children's social-emotional skills and competencies (Duda, Dunlap, Fox, Lentini, & Clarke, 2004; Hemmeter, Fox, Jack, Broyles, & Doubet, 2007). These models focus on establishing clear behavioral expectations and rules, which are systematically taught and reinforced across all school and classroom settings. This would include hallways and unspecified areas that are often hot spots for bullying in the preschool setting. Recent research on PBIS in elementary schools indicates that it is effective at reducing bullying perpetration as well as victimization (as reported by teachers), however, the effects appeared to be strongest among children first exposed to PBIS in kindergarten, relative to 1 or 2 grade, suggesting great promise as an effective prevention approach with younger children (Waasdorp, Bradshaw, & Leaf, 2012). It is important to remember, however, that even the most well-designed and rigorously tested interventions are only effective if they are implemented as intended. Schools and school districts need to have a vested interest in these programs, display strong administrative leadership, and provide appropriate and ongoing training for teachers (Domitrovich et al., 2008). Community and parent involvement are also

instrumental in the implementation of any preventive interventions to address bullying or aggressive behaviors in the classroom (Romera, Ortega, & Monks, 2008).

The context of the preschool classroom is an important factor to consider when aiming to reduce aggression and bullying among preschoolers. For example, one study of preschools examined the relationship between aggression and areas of the classroom and found that particular play areas in the classroom were associated with different types of aggression. Physical aggression most commonly occurred in areas such as around tables, language sections (i.e., vocabulary activities), cubbies, sand and water boxes, and the blocks. Relational aggression occurred most frequently in areas such as music, sand and water boxes, language stations, and cubbies (Adams, 2008). Similarly, areas such as the hallway, playground, and other areas with less clear behavioral expectations or rules have also been observed to have higher rates of aggressive behavior (e.g., free time, recess; Adams, 2008; Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; Cook & Nixon, 2006). This may be one reason why models, such as PBIS, which focus on increasing adult supervision and setting and reinforcing behavioral expectations across all school settings, have been shown to be effective at reducing behavior problems in preschool populations (Duda et al., 2004).

Taken together, these findings highlight the importance of carefully designing and supervising the common areas within the classroom. Proximity, room arrangement, appropriate play materials, and pre-planned student activities in certain areas of the classroom appear to be particularly important factors relevant to preschoolers' development of social-emotional skills, and thus should be considered in aiming to also reduce bullying (Peisner-Feinberg, Burchinal, Clifford, Culkin, Howes, & Kagan, 2000;

Adams, 2008). Of particular interest is proximity to an adult, which appears to play an especially salient role in reducing bullying and encouraging positive interactions between preschoolers. The presence of an adult, both in the classroom and on the playground, and during transitions, prompts younger children remember to interact in an appropriate manner with their peers (Adams, 2008; Cook & Nixon, 2006).

**What Can We Conclude from the Available Research on Bullying Among Preschoolers?**

There is a large and growing body of literature regarding bullying behavior among school-aged children; however, there is significantly less work on bullying among preschool-aged children. In summary, classroom and school contextual factors play an important role in reducing rates of bullying among preschoolers. Teachers can reduce instances of bullying through prevention programming, as well as improved classroom arrangements. Strategic placement of adult supervision during unstructured time such as recess or transitions can also decrease bullying.

The available data suggest this behavior occurs relatively frequently, but may be driven by different factors (e.g., lack of communication skills) in preschoolers as compared to school-aged children. As such, developmental factors play an important role in understanding how and why bullying is occurring. Similarly, developmental factors may also provide some insight on how to prevent bullying from occurring and persisting into later years, and how to buffer the effects of bullying once it has occurred.

There are several areas related to bullying in preschool that require further study. Given the fluctuating nature of the victimization and bullying behavior within the preschool context, additional research should explore this cycle of aggression and ways

to intervene effectively. Another important area for future research concerns measurement and assessment of preschool bullying. There is a need for more developmentally appropriate self-report measures, and methods of assessing bullying longitudinally across multiple developmental phases. This line of research is particularly challenging, as the method of assessment often shifts based on the child's age, with more reliance on observations among younger children, whereas self-report measures become more common once children reach grade 3 and above. Nevertheless, it is critical that preschoolers are administered measures that are sensitive to their cognitive, linguistic, and social stage of development. It is also clear that additional research is needed on strategies for preventing bullying among preschoolers. The available research suggests some programs are demonstrating promising effects on social-emotional and behavioral correlates of bullying, although few programs have specifically focused on preventing or assessing impacts of bullying (i.e., rather, most have focused on aggression or behavior problems more generally). Effective approaches for training teachers and parents in intervening in bullying situations, either in school, the community, or at home, are also needed, as are approaches for supporting children who have been victimized. Systematic approaches, such as PBIS, that aim to prevent bullying before it happens may hold promise for reducing bullying and its consequences among preschool-aged children.

References

Adams, J. L. (2008). *Preschool aggression within the social context: A study of families, teachers, and the classroom environment* ProQuest.

Alsaker, F. D. (2004). 15 bernese programme against victimisation in kindergarten and elementary school. *Bullying in Schools: How Successful can Interventions be.* 289.

Alsaker, F. D., & Gutzwiller-Helfenfinger, E. (2010). Social behavior and peer relationships of victims, bully-victims, and bullies in kindergarten. *The Handbook of School Bullying.an International Perspective, ,* 87-99

Alsaker, F. D., & Nägele, C. (2008). Bullying in kindergarten and prevention. *An International Perspective on Understanding and Addressing Bullying, 1,* 230-252.

Alsaker, F. D., & Valkanover, S. (2001). Early diagnosis and prevention of victimization in kindergarten. *Peer Harassment in School: The Plight of the Vulnerable and Victimized.* 175-195.

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., et al. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience, 256,* 174-186.

Arseneault, L., Walsh, E., Trzesniewski, K., Newcombe, R., Caspi, A., & Moffitt, T. E. (2006). Bullying victimization uniquely contributes to adjustment problems in young children: A nationally representative cohort study. *Pediatrics, 118,* 130-138.

Arsenio, W. F., & Lemerise, E. A. (2004). Aggression and moral development: Integrating social Information processing and moral domain models. *Child Development, 75*(4), 987-1002.

Baydar, N., Reid, M. J., & Webster-Stratton, C. (2003). The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers. *Child development*, 1433-1453.

Björkqvist, K. (1994). Sex differences in physical, verbal, and indirect aggression: A review of recent research. *Sex Roles, 30*(3-4), 177-188.

Björkqvist, K., Österman, K., & Kaukiainen, A. (1992). The development of direct and indirect aggressive strategies in males and females. *Of Mice of Women: Aspects of Female Aggression*

Boulton, M. J. (1999). Concurrent and longitudinal relations between children's playground behavior and social preference, victimization, and bullying. *Child Development, 70*(4), 944-954.

Boulton, M. J., & Underwood, K. (1992). Bully/victim problems among middle school children. *British Journal of Educational Psychology, 62*(1), 73-87.

Bradshaw, C.P. (2015). Translating research to practice in bullying prevention. *American Psychologist, 70* (4), 322–332.

Burchinal, M. R., Peisner-Feinberg, E., Bryant, D. M., & Clifford, R. (2000). Children's social and cognitive development and child-care quality: Testing for differential associations related to poverty, gender, or ethnicity. *Applied Developmental Science, 4*(3), 149-165.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*(5), 1185-1229.

Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial behavior. *Handbook of child psychology, 5th ed.: Vol 3. Social, emotional, and personality development*. , (pp. 779-862)

Cook, A., & Nixon, C. (2006). Ophelia facts: Question: Who reports bullying, how often do they report it, and to whom? by the Ophelia project. Retrieved from http://www.opheliaproject.org/facts/ReportingRA.pdf

Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social - psychological adjustment. *Child Development, 66*(3), 710-722.

Crick, N. R., Casas, J. F., & Mosher, M. (1997). Relational and overt aggression in preschool. *Developmental Psychology, 33*(4), 579.

Crick, N. R., Casas, J. F., & Ku, H. (1999). Relational and physical forms of peer victimization in preschool. *Developmental Psychology, 35*(2), 376.

Crick, N. R., Ostrov, J. M., Burr, J. E., Cullerton-Sen, C., Jansen-Yeh, E., & Ralston, P. (2006). A longitudinal study of relational and physical aggression in preschool. *Journal of Applied Developmental Psychology, 27*(3), 254-268.

Cummings, E.,Iannotti, R., Zahn-Waxler, C. (1989). Aggression between peers in early childhood: Individual continuity and developmental change. *Child Development, 60,* 887–895.

Domitrovich, C. E., Cortes, R. C., & Greenberg, M. T. (2007). Improving young

children's social and emotional competence: A randomized trial of the preschool "PATHS" curriculum. *Journal of Primary Prevention, 28*(2), 67-91.

Duda, M. A., Dunlap, G., Fox, L., Lentini, R., & Clarke, S. (2004). An experimental evaluation of positive behavior support in a community preschool program. *Topics in Early Childhood Special Education*, *24*, 143-155.

Dunn, J., Slomkowski, C., & Beardsall, L. (1994). Sibling relationships from the preschool period through middle childhood and early adolescence. *Developmental Psychology*, *30*(3), 315.

Diamond, K.E., (2002). The Development of social competence in children with disabilities. In P. Smith & C. Hart (Eds.), *Blackwell Handbook of childhood social development* (pp. 570-587). Malden, MA: Blackwell

Domitrovich, C. E., Bradshaw, C. P., Poduska, J., Hoagwood, K., Buckley, J., Olin, S., Romanelli, L. H., Leaf, P. J., Greenberg, M. T., & Ialongo, N. S. (2008). Maximizing the implementation quality of evidence-based preventive interventions in schools: A conceptual framework. *Advances in School Mental Health Promotion: Training and Practice, Research and Policy, 1*(3), 6-28. doi:10.1080/1754730X.2008.9715730

DiLalla, L. F. (2002). Behavior genetics of aggression in children: Review and future directions. *Developmental Review, 22*(4), 593-622.

Duda, M. A., Dunlap, G., Fox, L., Lentini, R., & Clarke, S. (2004). An experimental evaluation of positive behavior support in a community preschool program. *Topics in Early Childhood Special Education*, *24*, 143-155.

Ensor, R, Marks, A, Jakobs, L, Hughes, C. (2010). Trajectories of antisocial behavior

towards siblings predict antisocial behavior towards peers. *Journal of Child Psychology and Psychiatry,* 511, 208-1216

Fagot, B. I., & Patterson, G. R. (1969). An in vivo analysis of reinforcing contingencies for sex-role behaviors in the preschool child. *Developmental Psychology, 1*(5), 563.

Farrington, D., & Ttofi, M. (2009). School-based programs to reduce bullying and victimization: A systematic review. *Campbell Systematic Reviews, 5*(6).

Foley, D., Eaves, L., Wormley, B., Silberg, J., Maes, H., Kuhn, J., & Riley, B. (2004). Childhood adversity, monoamine oxidase a genotype, and risk for conduct disorder. *Archive of General Psychiatry, 61*(7), 738-744.

Gladden, R. M., Vivolo-Kantor, A. M., Hamburger, M. E., & Lumpkin, C. D. (2014). Bullying surveillance among youths: Uniform definitions for public health and recommended data elements, version 1.0. *Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention and US Department of Education.*

Godleski, S. A., Kamper, K. E., Ostrov, J. M., Hart, E. J., & Blakely-McClure, S. J. (2015). Peer victimization and peer rejection during early childhood. *Journal of Clinical Child & Adolescent Psychology,* 44(3), 380-392.

Griffin, R. S., & Gross, A. M. (2004). Childhood bullying: Current empirical findings and future directions for research. *Aggression and Violent Behavior, 9*(4), 379-400.

Guralnick, M.J. (2010). Early intervention approaches to enhance the peer-related social competence of young children with developmental delays: A historical perspective. *Infants and Young Children, 23,* 73-83.

Hamburger, M.E., Basile, K.C., & Vivolo, A.M. (2011) *Measuring Bullying Victimization, Perpetration, and Bystander Experiences: A Compendium of Assessment Tools.* Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.

Hanish, L. D., & Guerra, N. G. (2000). Children who get victimized at school: What is known? what can be done? *Professional School Counseling, 4*(2), 113.

Hanish, L. D., Kochenderfer-Ladd, B., Fabes, R. A., Martin, C. L., & Denning, D. (2004). Bullying among young children: The influence of peers and teachers. *Bullying in American Schools: A Social-Ecological Perspective on Prevention and Intervention*141-159.

Hanish, L. D., Martin, C. L., Fabes, R. A., Leonard, S., & Herzog, M. (2005). Exposure to externalizing peers in early childhood: Homophily and peer contagion processes. *Journal of Abnormal Child Psychology, 33*(3), 267-281.

Hemmeter, M.L., Fox, L., Jack, S., Broyles, L., & Doubet, S. (2007). A program-wide model of positive behavior support in early childhood settings. *Journal of Early Intervention, 29*, 337-355.

Ialongo, N. S., Vaden-Kiernan, N., & Kellam, S. (1998). Early peer rejection and aggression: longitudinal relations with adolescent behavior. *Journal of Developmental and Physical Disabilities, 10*(2), 199-213.

Juvonen, J., & Graham, S. (2001). *Peer harassment in school: The plight of the vulnerable and victimized*. New York, NY: Guilford Press.

Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Cause or consequence of school maladjustment? *Child Development, 67*(4), 1305-1317.

Ladd, G. W., & Ladd, B. K. (1998). Parenting behaviors and parent–child relationships: Correlates of peer victimization in kindergarten? *Developmental Psychology, 34*(6), 1450-1458.

Ladd, G. W., & Profilet, S. M. (1996). The child behavior scale: A teacher-report measure of young children's aggressive, withdrawn, and prosocial behaviors. *Developmental Psychology, 32*(6), 1008-1024.

Ladd, G. W., & Burgess, K. B. (1999). Charting the relationship trajectories of aggressive, withdrawn, and aggressive/withdrawn children during early grade school. *Child Development, 70*(4), 910-929.

Lagerspetz, K. M., Björkqvist, K., & Peltonen, T. (1988). Is indirect aggression typical of females? gender differences in aggressiveness in 11to 12yearold children. *Aggressive Behavior, 14*(6), 403-414.

Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., Moffitt, T. E., Caspi, A., White, H. R., . . . Beyers, J. M. (2003). Development of male offending: Key findings from fourteen years of the Pittsburg Youth Study. In T. T. & M. Krohn (Eds.), *Taking stock of delinquency: An overview of findings from contemporary longitudinal studies* (pp. 93-136). New York: Klewer/Plenum

Maccoby, E. E. (1990). Gender and relationships: A developmental account. *American Psychologist, 45*(4), 513-520.

Moffitt, T. E. (2006). Life-course-persistent versus adolescence-limited antisocial behavior. In D. Cicchetti, Cohen, D. J. (Ed.), *Developmental Psychopathology* (Vol. 3, pp. 570-598). Hoboken, NJ: John Wiley & Sons.

Monks, C., Ortega Ruiz, R., & Torrado Val, E. (2002). Unjustified aggression in preschool. *Aggressive Behavior, 28*(6), 458-476.

Monks, C. P., Smith, P. K., & Swettenham, J. (2005). Psychological correlates of peer victimisation in preschool: Social cognitive skills, executive function and attachment profiles. *Aggressive Behavior, 31*(6), 571-588.

Monks, C. P., & Smith, P. K. (2006). Definitions of bullying: Age differences in understanding of the term, and the role of experience. *British Journal of Developmental Psychology, 24*(4), 801-821.

Morin, H. & Bradshaw, C.P. (2017). Relational Bullying and Psychosocial Correlates Across the Lifecourse. In C. Bradshaw (Ed.) *Handbook on bullying prevention: A Lifecourse perspective.* New York: National Association of Social Workers Press.

Nagin, D. S., & Tremblay, R. E. (2001). Parental and early childhood predictors of persistent physical aggression in boys from kindergarten to high school. *Archives of General psychiatry, 58*(4), 389-394.

Olweus, D. (2003). A profile of bullying at school. *Educational Leadership, 60*(6), 12-17.

Orpinas, P., & Horne, A. M. (2006). *Bullying prevention: Creating a positive school climate and developing social competence.* Washington DC. US: American Psychological Association.

Ostrov, J. M., & Keating, C. F. (2004). Gender differences in preschool aggression during free play and structured interactions: An observational study. *Social Development, 13*(2), 255-277.

Ostrov, J. M., Woods, K. E., Jansen, E. A., Casas, J. F., & Crick, N. R. (2004). An observational study of delivered and received aggression, gender, and social-psychological adjustment in preschool: "This white crayon doesn't work…". *Early Childhood Research Quarterly, 19*(2), 355-371.

Ostrov, Kamper, Blakely-McClure, Faracca, & Godleski, (2017). Developmental Roots of Bullying: In C. Bradshaw (Ed.) *Handbook on bullying prevention: A Lifecourse perspective.* New York: National Association of Social Workers Press.

Ostrov, J. M., Godleski, S. A., Kamper-DeMarco, K. E., Blakely-McClure, S. J., & Celenza, L. (2015). Replication and extension of the early childhood friendship project: effects on physical and relational bullying. *School psychology review, 44*(4), 445-463.

Ostrov, J. M., Massetti, G. M., Stauffacher, K., Godleski, S. A., Hart, K. C., Karch, K. M., . . .

Ries, E. E. (2009). An intervention for relational and physical aggression in early childhood: A preliminary study. *Early Childhood Research Quarterly, 24*, 15–28.

Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., & Kagan, S. L. (2000). *The children of the cost, quality, and outcomes study go to school: Technical report.* Chapel Hill: University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Centre

Pellegrini, A. D. (1998). Bullies and victims in school: A review and call for research. *Journal of Applied Developmental Psychology, 19*(2), 165-176.

Pellegrini, A. D., Bartini, M., & Brooks, F. (1999). School bullies, victims, and aggressive victims: Factors relating to group affiliation and victimization in early adolescence. *Journal of Educational Psychology, 91*(2), 216-234.

Pepler, D. J., & Craig, W. M. (1995). A peek behind the fence: Naturalistic observations of aggressive children with remote audiovisual recording. *Developmental Psychology, 31*(4), 548-553.

Pepler, D., & Craig, W. (1997). Bullying: Research and interventions. *Youth Update, 15*(1).

Perren, S., & Alsaker, F. D. (2006). Social behavior and peer relationships of victims, bully - victims, and bullies in kindergarten. *Journal of Child Psychology and Psychiatry, 47*(1), 45-57.

Perry, D.G., Perry L.C., & Boldizar, J.P. (1990) Leaning of Aggression. In M. Lewis & S. Miller (Eds.) *Handbook of Developmental Psychopathology*. New York: Plenum.

Piaget, J. (1932). The moral development of the child. London: K*egan Paul,*

Piaget, J. (1977). *The development of thought: Equilibration of cognitive structures.(trans A. rosin).* Oxford, England: Viking.

Rhee, S. H., & Waldman, I. D. (2002). Genetic and environmental influences on antisocial behavior: A meta-analysis of twin and adoption studies. *Psychological Bulletin, 128*(3), 490-529.

Richman, N., Stevenson, J., & Graham, P. J. (1982). Pre-school to school: A behavioural study. *Behavioural Development: A Series of Monographs*

Romera, E.M., Ortega, R., Monks, C. (2008). Impacto de la actividad ludica en el desarrollo de la competencia social [Impact of recreational activities in the development of social competence]. *International Journal of Psychology and Psychological Therapy, 8*, 193-202.

Rose, C. A., Monda-Amaya, L. E., & Espelage, D. L. (2011). Bullying perpetration and victimization in special education: A review of the literature. *Remedial and Special Education, 32*, 114-130. doi: 10.1177/0741932510361247

Rose, C. A., Richman, D. M., Fettig, K., Hayner, A., Slavin, C., & Preast, J. (2014). Peer reactions to early childhood aggression in a preschool setting: Defenders, encouragers, or neutral bystanders. *Developmental Neurorehabilitation*. Online First. doi:10.3109/17518423.2014.979955

Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. *Handbook of child psychology, 3*(5), 619-700. Rubin, K. H., & Coplan, R. J. (2004). Paying attention to and not neglecting social withdrawal and social isolation. *Merrill-Palmer Quarterly, 50*(4), 506-534.

Salmivalli, C., Ojanen, T., Haanpää, J., & Peets, K. (2005). I'm OK but you're not and other peer-relational schemas: Explaining individual differences in children's social goals. *Developmental Psychology, 41*(2), 363-375.

Smith, P. K., & Levan, S. (1995). Perceptions and experiences of bullying in younger pupils. *British Journal of Educational Psychology, 65*(4), 489-500.

Smith, P. K., Cowie, H., Olafsson, R. F., & Liefooghe, A. P. (2002). Definitions of bullying: A comparison of terms used, and age and gender differences, in a Fourteen–Country international comparison. *Child Development, 73*(4), 1119-1133.

Son, E., Peterson, N. A., Pottick, K. J., Zipay, A., Parish, S., & Lohrmann, S. (2014). Peer victimization among young children with disabilities: Early risk and protective factors. *Exceptional Children, 80*(3), 368-384. doi: 10.1177/0014402914522422

Strayer, F. F., & Santos, A. (1996). Affiliative structures in preschool peer groups. *Social Development, 5*(2), 117-130.

Sutton, J., Smith, P. K., & Swettenham, J. (1999). Bullying and 'theory of mind': A critique of the 'social skills deficit' view of anti-social behaviour. *Social Development, 8*(7), 117-127.

Tremblay, R. E., Nagin, D. S., Seguin, J. R., Zoccolillo, M., Zelazo, P. D., Boivin, M., et al. (2004). Physical aggression during early childhood: Trajectories and predictors. *Pediatrics, 114*(1), 43-50.

Troy, M., & Sroufe, L. A. (1987). Victimization among preschoolers: Role of attachment relationship history. *Journal of the American Academy of Child & Adolescent Psychiatry, 26*(2), 166-172.

Tucker, C. J., Finkelhor, D., Turner, H. A., & Shattuck, A. (2013). Association of sibling aggression with child and adolescent mental health. *Pediatrics, 132*, 79–84. doi: 10.1542/peds.2012-3801

Vlachou, M., Andreou, E., Botsoglou, K., & Didaskalou, E. (2011). Bully/victim problems among preschool children: A review of current research evidence. *Educational Psychology Review, 23*(3), 329-358.

Vlachou, M., Andreou, E., Botsoglou, K., & Didaskalou, E. (2011). Bully/victim problems among preschool children: A review of current research evidence. *Educational Psychology Review*, *23*(3), 329-358..

Waasdorp, T. E., Bradshaw, C. P. & Duong, J. (2011). The link between parents' perceptions of the school and their responses to school bullying: Variation by child characteristics and the forms of victimization. *Journal of Educational Psychology, 103*(2), 324-335.

Waasdorp, T. E., Bradshaw, C. P., & Leaf, P. J. (2012). The impact of School-wide Positive Behavioral Interventions and Supports (SWPBIS) on bullying and peer rejection: A randomized controlled effectiveness trial. *Archives of Pediatrics and Adolescent Medicine, 116*(2), 149-156. doi: 10.1001/archpediatrics.2011.755

Webster-Stratton, C., Jamila Reid, M., & Stoolmiller, M. (2008). Preventing conduct problems and improving school readiness: evaluation of the incredible years teacher and child training programs in high-risk schools. *Journal of child psychology and psychiatry*, *49*(5), 471-488.

Werner, E. E. (1995). Resilience in development. *Current Directions in Psychological Science, 4 (3),* 81-85.

Werner, N. E., Bumpus, M. F., & Rock, D. (2010). Involvement in internet aggression during early adolescence. *Journal of Youth and Adolescence, 39*(6), 607-619.

Wuellner, L. (1969). *The effect on aggression of variation in the amount of opportunities for play*. University of Illinois, Children's Research Centre, Urbana, IL.

Younger, A. J., Schwartzman, A. E., & Ledingham, J. E. (1986). Age-related differences in children's perceptions of social deviance: Changes in behavior or in perspective? *Developmental Psychology, 22*(4), 531.

**Manuscript 2**

# Bystander Reactions to Bullying: Exploring the Factors that Predict Students' Willingness to Intervene

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Abstract

The response patterns of youth who witness bullying have potential to influence future occurrence and persistence of bullying behaviors. Prevention efforts have included an increased focus on bystander interventions, which target the reactions of witnesses; however, the majority of adolescents rarely intervene in bullying situations. When they do, they often display of mixed pattern of behaviors. To better understand factors related to adolescent responses to witnessing bullying, the current study drew upon school climate survey data reported by 57,314 middle and high school students. Logistic regression analyses demonstrated higher odds of bully assisting behavior among those with higher externalizing symptoms and higher odds of defending the targets among those with elevated internalizing symptoms. Prior bullying victimization was associated with higher odds of all three bystander behavior response types. Together, these findings highlight the salient role of youth's prior victimization and mental health in youth responses to witnessing bullying. Implications for bystander-focused bullying prevention efforts are considered.

## Youth Reactions to Bullying: Exploring the Factors Associated with Students' Willingness to Intervene

Bullying is an experience which negatively affects bullies and victims, but also those who witness bullying incidents, often referred to as "bystanders". Peer responses to witnessing bullying can potentially influence bullying occurrence and persistence, as well as its effects. For example, research suggests that youth who intervene to defend the target will likely end the incident, whereas youth who laugh at or silently watch the bullying could encourage it to continue (O'Connell, Pepler, & Craig, 1999; Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996). Furthermore, witnesses who comfort the victim after the incident or seek help from an adult can improve the target's mental health outcomes (Polanin, Espelage, & Pigott, 2012). Given the increased risk for involvement in bullying during adolescence, and the potential benefits of bystander intervention during this developmental phase (Polanin et al., 2012), additional research is needed to better understand factors associated with different patterns of responses to witnessing bullying among middle and high schoolers.

### Witnessing Bullying in High School and Middle School

A youth witness, often referred to as a "bystander", is present in approximately 80% of bullying incidents (Polanin et al., 2012). Three common bystander responses patterns have been identified in research: assisting behaviors (e.g., laughing at the victim, joining in on the bullying), defending behaviors (e.g., intervening on behalf of the victim, comforting the victim), and outsider behaviors (e.g., staying out the bullying; Rivers,

Poteat, Noret, & Ashurst, 2009; Salmivalli, Huttunen, & Lagerspetz, 1997). Youth may display a mix of these response patterns depending on the situation (Waasdorp & Bradshaw, 2018). For example, *bully assisting* is a pattern of responses that perpetuates bullying through various actions, such as joining in on the bullying and reinforcing or encouraging the bully through positive responses to the aggressive behavior (Rivers et al., 2009; Salmivalli et al., 1997); this perpetuates the bullying by increasing levels of perceived peer support. Studies estimate that 20-30% of youth demonstrated bully assister behaviors (Gini, Albiero, Benelli, & Altoe, 2008; Salmivalli et al., 1996).

*Defending behaviors* are those that intervene on behalf of the targeted youth. This includes comforting the victim, actively stopping the bully, or getting an adult involved (Rivers et al., 2009; Salmivalli et al., 1997). Approximately 20% of youth are estimated to engage in defending behaviors (Gini et al., 2008; Salmivalli et al., 1996). These youth tend to have negative feelings about bullying and believe that bullying is a serious problem (Pozzoli & Gini, 2013). Defending behaviors may be driven by youth's empathic response to the victims' experience when they are bullied (Pöyhönen, Juvonen, & Salmivalli, 2010).

*Outsider or passive bystander behaviors* include avoiding the area where the bullying occurs, not taking sides with the bully or victim, and ignoring or pretending to have no awareness of the event (Rivers et al., 2009; Salmivalli et al., 1997). Approximately 20-30% youth assume this role (Gini et al., 2008; Salmivalli et al., 1996). Outsiders' passive responses are often considered as condoning the bullying behavior (Gini et al., 2008). Whereas adolescents generally have negative views towards bullying and are aware that they have the power to help the victim, personal desire for peer

acceptance may impede their actual intervening behaviors (Cowie, 2014; Salmivalli, 2010). Although these youth may experience emotional distress over not intervening, alienation from more influential peers may drive passivity (Cowie, 2014; Salmivalli, 2010).

**Correlates of Bystander Behavior**

**Individual psychological factors.** Witnesses who had been previously victimized themselves tend to experience increased levels of social maladjustment as compared to non-victimized bystanders (Pöyhönen et al., 2010). In fact, students' physiological and psychological responses to recollecting witnessing bullying were similar to their responses of recalling actually being bullied. This suggests that one's prior experience of victimization may be correlated with their own responses to witnessing bullying (e.g., due to empathic response; Janson & Hazler, 2004).

Individual psychological adjustment may also relate to bullying participant roles. For example, aggressive behaviors, as reflected through a broader pattern of externalizing symptomology, have been linked with bully assisting (Rivers et al., 2009). Less is known, however, about factors associated with students' engagement in outsider response patterns. Disengagement and apathy are symptoms of internalizing problems and have been correlated with outsider behaviors (Pozzoli & Gini, 2010). Other studies have shown that outsiders were as empathic as victim defenders (Gini et al., 2008), yet their low levels of self-efficacy (related to internalizing problems) differentiated them from defenders, who tended to have high levels of self-efficacy (Gini et al., 2008). Together, these findings suggest that students' internalizing problems may be associated with their responses to witnessing bullying.

**School connectedness and resources.** Feelings of connectedness, an important aspect of school climate and bullying prevention programs (Bradshaw, Waasdorp, Debnam, & Lindstrom Johnson, 2014), have been linked with both bullying and bystander behaviors. Witnesses have reported feeling less safe and connected to their schools (Polanin et al., 2012). Similarly, youth who were less connected to their peers were less willing to intervene on behalf of the target (Pozzoli et al., 2012). Furthermore, prior research suggests access to resources and support may be associated with more favorable bullying responses (Morin, Bradshaw, & Kush, 2018). Thus, school connectedness and greater resources available to support students could have more desirable responses to witnessing bullying (i.e., defending behaviors).

**Demographics.** Gender and age have been shown to predict bystander responses (Gini et al., 2008), such that girls are more likely to defend, whereas boys were more likely to assist or reinforce the bullying (Trach, Hymel, Waterhouse & Neale, 2010). Girls' likelihood of defending was consistent across elementary school (grades 1-6). Conversely, older boys (grades 4-6) were more likely to assist or reinforce the bully than younger boys (grades 1-3; O'Connell et al., 1999). Research remains sparse with differences between middle and high schoolers, despite developmental differences which would suggest middle schoolers would be more likely to use defending behaviors. A unique feature of this study was the opportunity to contrast middle and high school students' bystander responses.

## Current Study

We aimed to identify student and school perceptual factors associated with bully assisting, victim defending, and passive outsider responses to witnessing bullying among

middle and high schoolers. Informed by a social-ecological model (see Bradshaw, 2017; Espelage & Swearer, 2004) and social cognitive theory, we examined students' individual perceptions of their own behaviors and their perceptions of school connectedness and resources. Based on prior literature (e.g., Card, Stucky, Sawalani, & Little, 2008), we hypothesized that externalizing symptomology would be associated with assisting behavior patterns. Conversely, youth with internalizing symptoms were hypothesized to be more likely to act as outsiders (Pozzoli & Gini, 2010). We also hypothesized that students' previous experiences being bullied would be associated with more victim defending behaviors; we expected previously bullied youth to be more empathetic towards the victim, which in turn would increase their likelihood of intervening (Epps, Park, Huston, & Ripke, 2005).

We hypothesized that students who felt more connected to their school and who had higher perceptions of available school resources would be more likely to engage in victim defending behaviors (Morin et al., 2018; Rigby, 2000). Regarding demographics, we hypothesized that girls would be more likely to use defending behaviors (Ginni et al., 2008; Salmivalli et al., 1996). We contrasted bystander behaviors among middle versus high schoolers, given important developmental and social differences that exist during this stage, hypothesizing that the latter would engage in less defending behaviors (Polanin et al., 2012).

## Method

### Participants

Data were collected from web-based survey responses from 57,314 adolescents in spring of 2015 across 114 Maryland middle and high schools in the Maryland Safe and Supportive Schools (MDS3) Initiative. See Table 1 for demographics.

**Procedure**

Representatives from the Maryland State Department of Education led the voluntary recruitment of schools into the MDS3 Initiative. Student data were collected through a voluntary and anonymous on-line survey. Data were collected through a passive parental consent and youth assent processes; parents/guardians received letters that provided them with information on their child's voluntary participation in the on-line survey. Parents wishing to exclude their child from the data collection returned a signed form declining participation; it was estimated that less than 5% of parents declined participation. The student response rate for the survey is estimated at 76%, including completions and partials (i.e., RR2 formula; American Association for Public Opinion Research, 2016). School staff followed a written protocol for administering the survey. The researchers' Institutional Review Board approved the data collection and analyses.

**Measures**

Data from the following MDS3 School Climate Student Survey (Bradshaw et al., 2014) scales, all of which have been extensively studied with regard to psychometric analyses and construct validity (see Bradshaw et al., 2014), were analyzed in the current study.

**Bystander behavior patterns.** Students were asked to report their responses to witnessing bullying by answering the following question: *What do you usually do if you see that another student is being bullied?* Participants were instructed to check all that

applied (multiple responses were allowed): *(a) watch the bullying but do nothing to stop it; (b) join in on the bullying; (c) stay out of the bullying; (d) try to make the others stop bullying; (e) ignore the bullying; (f) laugh at the bullying; (g) comfort the person being bullied; (h) encourage the person being bullied to tell a teacher; (i) tell an adult about the bullying; (j) other; (k) I have never seen anyone being bullied.* These items were adapted from the Participant Role Questionnaire (Salmivalli & Voeten, 2004). Each response was coded as a yes = 1 or a no = 0 (see Figure 2 for the percent of participants who endorsed each response). The survey also included the following definition of bullying at the outset of bullying questions: "A person is bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more persons. Bullying often occurs in situations where there is a power status difference. Bullying includes actions like threatening, teasing, name calling, ignoring, rumor spreading, sending hurtful emails and text messages, and leaving someone out on purpose," (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014).

Given debate around the difference between bully assisters and outsiders (i.e., that outsiders can be seem complicit; Gini et al., 2008), we used exploratory factor analysis (EFA), rather than a confirmatory approach, to examine the three response types in relation to these items. Consistent with prior research suggesting that the outsider response represents a unique pattern (Salmivalli et al., 1996; Waasdorp & Bradshaw, 2018), the EFA indicated that defending behaviors, assisting behaviors, and outsider behaviors represented three discrete patterns. The EFA used principal axis factoring and orthogonal rotation, limiting assessment of factors with eigenvalues > 1. Defending behaviors included four items: try to make the others stop the bullying ($\lambda = .522$),

comfort the person being bullied (λ = .679), encourage the person being bullied to tell a teacher (λ = .76), tell an adult about the bullying (λ = .609). Bully assisting behaviors included three items: watch the bullying but do nothing to stop it (λ = .440), join in on the bullying (λ = .661), and laugh at the bullying (λ = .702). Outsider behaviors included two items: stay out of the bullying (λ = .496) and ignore the bullying (λ = .518).

Based on these results, three composite indicators were created to yield bully assisting, victim defending, and outsider outcome variables. Specifically, if a student endorsed any of the three items from the bully assisting category (noted above), the bully assisting variable was coded = 1, whereas if a student endorsed none of the bully assisting items, the bully assisting variable was coded = 0. The same coding process was used to create the victim defending and outsider outcome variables. This approach allowed students to have none, one, two, or all three types of bystander behavior, which helped us to account for the overlap of responses to witnessing bullying (Waasdorp & Bradshaw, 2018). See Figure 1 for overlap in response patterns and Table 2 for Pearson's correlations.

**Prior victimization.** After reading the provided definition of bullying, students were asked if they had been bullied in the current school year. The response options included *yes* (= 1; 23.7%) or *no* (= 0; 76.3%) (Bradshaw, Sawyer, & O'Brennan, 2007).

**Internalizing and externalizing problems.** Participants responded to the following questions on a four-point Likert scale from one (*Never)* to four *(Almost Always)* as an indicator of internalizing problems: *I am sad, I feel depressed, I feel nervous or anxious, I am worried something bad is going to happen,* and *I am lonely* (*M* = 1.89, *SD* = .74; 5 items, α= .847). Similarly, participants responded to the following

questions as an indicator of externalizing problems: *I have trouble controlling my temper; I have threatened to hit or hurt someone; I get mad easily, I do things without thinking* ($M$ = 1.95, $SD$ = .77; 4 item $\alpha$=.806). These items were adapted from the Behavioral Assessment System for Children (Reynolds & Kamphaus, 2004).

**Student perceptions of school connectedness.** The survey included 4 items regarding school connectedness (i.e., *I enjoy learning at this school; I like this school; I like coming to school; At this school, students like one another;* 4 items, $\alpha$ = .829) adapted from the California Healthy Kids Survey (Bradshaw et al., 2014; Hanson & Kim, 2007). Participants responded to each item on a four-point Likert scale from one (*Strongly Disagree*) to four (*Strongly Agree*); the responses were averaged, such that a higher score indicated feeling more connected ($M$ = 2.72, $SD$ = .79*)*.

**Student perceptions of resources**. Students responded to the following questions: *Teachers at this school help students with their problems; students who need help with their problems are able to get it through school; there is someone at this school who I can talk to about personal problems* (3 item $\alpha$=.780; California Healthy Kids Survey, 2010) on a four-point Likert scale from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*); items were averaged, such that a higher score indicated greater perceived access to services and resources ($M$ = 2.85, $SD$ = .74).

**Overview of the Analyses**

All statistical analyses were conducted in SPSS and Stata. We ran a series of binomial logistic regression models with clustered robust standard errors to address our hypotheses regarding the extent to which student and school perceptual variables (i.e., internalizing and externalizing symptomology, previous victimization experience, school

connectedness, access to services and resources, and demographics) were associated with bystander behaviors. For all of the regression models, the outcome variable was the dichotomized responses to witnessing bullying (i.e., victim defending, bully assisting, passive outsider) and the predictor variables were the individual and school characteristics of interest. For all of the logistic regression analyses, we report adjusted odds ratios (AOR; see Table 3). Robust standard errors were calculated to account for student clustering within schools.

## Results

Findings suggested that the vast majority of responses endorsed victim defending behaviors, whereas outsider behaviors were the second most endorsed, followed by bully assisting behaviors, which were the least frequently endorsed (see Figure 2 for the individual item responses for each bystander response category). Figure 3a suggested that males more often acted as bully assisters whereas females more often acted as victim defenders or outsiders. Figure 3b suggested that middle school students have higher rates of victim defending, whereas high school students had higher rates of bully assisting and passive outsider responses. Lastly, Figure 3c reports the responses by race, which showed that bully assisting behaviors had a slightly smaller proportion of White students' endorsement and slightly higher proportion of Black, Asian, and Other race/ethnicity students' endorsement, compared to the outsider and victim defending behavior patterns.

### Associations with Bully Assisting Behaviors

The logistic regression analyses (see Table 3) indicated that externalizing symptomology was associated with increased odds of engaging in assisting the bully behaviors. Each point on the externalizing scale was associated with a 69% increase in

the odds of a bully assisting response (AOR = 1.690; $p < .001$). Males had higher odds of acting as bully assisters (AOR = 1.437; $p < .001$), compared to females, and students of color had higher odds of reporting bully assisting responses relative to White students (AORs ranged from 1.333 to 1.737; $p < .001$). Middle schoolers had significantly higher odds of acting as assisters, as compared to high schoolers (AOR = 0.824; $p < .001$). School connectedness (AOR = 0.771; $p < .001$) and school resources (AOR = 0.737; $p < .001$) were inversely associated with acting as a bully assister. Previous victimization experience was associated with significantly higher odds of assisting the bully (AOR = 1.837; $p < .001$).

**Associations with Victim Defending Behaviors**

Students who felt more connected to their school had significantly higher odds of using defending behaviors (AOR = 1.252; $p < .001$). For each point higher on connectedness, students had 25.2% higher odds of defending the victim. Each point increase on perceived school resources was associated with 14.7% increase in the odds of defending the victim (AOR = 1.147; $p < .001$). Demographic analyses indicated that male students (AOR = 0.566; $p < .001$) had significantly lower odds of acting as defenders. Similarly, Asian and Black students had significantly lower adjusted odds of reporting victim defending behaviors than White students (AORs ranged from .894 to .903). Previous victimization experience (AOR=2.863; $p < .001$) was associated with significantly higher odds of engaging in defending behaviors. Each point higher on externalizing symptomology was associated with 4.1% lower odds of defending the victim (AOR = 0.959; $p < .01$). Higher internalizing symptomology (AOR=1.382; $p < .001$) was associated with higher odds of victim defending behavior, such that the odds of

acting as a defender were higher by 38.2% for every additional point on internalizing symptoms. Middle school students had significantly higher odds of defending the victim, as compared to high school students (AOR = 1.511; $p < .001$).

**Associations with Outsider Behaviors**

Higher internalizing symptomology was associated with higher odds of engaging in outsider behaviors (e.g., ignoring or staying out of the bullying) (AOR = 1.134; $p < .001$). Specifically, each point higher on internalizing symptoms was associated with 13.4% higher odds displaying outsider responses. Externalizing behaviors were significantly associated with higher odds of displaying outsider responses (AOR = 1.028; $p < .05$). For every point higher on externalizing behaviors, students had approximately 3% higher odds of displaying outsider responses. Furthermore, students who were previously bullied had 115.8% higher odds of displaying outsider responses (AOR=2.158; $p < .001$). Males (AOR=0.791; $p < .001$) had significantly lower odds of reporting outsider responses, as compared to females. Latinx, Black, and other race/ethnicity students had significantly lower odds of reporting outsider responses (AORs ranged from .855 to .926). School connectedness was associated with lower odds of engaging in outsider behaviors (AOR=0.876; $p < .001$); each point higher on connectedness was associated with 12.4% lowered odds of acting as an outsider. Perceived school resources was also associated with lowered odds of reporting outsider responses (AOR = 0.905; $p < .001$); each one-point higher in perceived resources was associated with approximately a 10% decrease in the odds of displaying outsider behaviors.

## Discussion

The present study explored the extent to which personal and psychological factors were associated with youths' responses to witnessing bullying, including bully assisting, victim defending, and outsider responses.

**Bully Assisting**

Associations between bully assisting and externalizing symptomology were particularly salient, suggesting that anger, impulsivity, and related psychological processes may be related to students' likelihood to engage in bullying assisting. This is consistent with prior research suggesting ties between aggression and bully assisting bystander responses (Rivers et al., 2009). Previous victimization experience was also associated increased odds of reporting bully assisting. Another interpretation of the latter finding is that it is possible that students who were previously bullied may be keenly aware of the emotional consequences of being victimized, increasing their motivation to avoid future victimization. As such, these students may join in on bullying in order to avoid being bullied again themselves. However, our findings also indicated that perceived school connectedness and access to resources were associated with lower odds of engaging in assisting behavior, suggesting the potential mitigating effect of supportive school climate on aggressive bystander responses. In terms of demographic and developmental factors, our finding that males had higher odds of assisting the bully, as compared to females, is consistent with current findings in bystander literature (Cook, Williams, Guerra, Kim, & Sadek, 2010). This may be related to differences in emotional expression that vary by gender. The finding that students of color were more likely to endorse bully assisting behaviors than their white counterparts may be understood in light of ethnographic research highlighting that a confrontational stance in response to

violence, particularly among boys of color, may increase perceptions of safety and control (Fagan & Wilkinson, 1998). In addition, students of color fairly consistently report lower levels of supportive and fair school climates (Bottiani, Bradshaw, & Mendelson, 2016), and research on the adaptive function of aggression highlights that aggression is increased when youth perceive their environment as non-efficacious (Salzinger, Rosario, Feldman, & Ng-mak, 2008). Additional research is needed to confirm and further understand this pattern of findings. Middle school students were less likely to act as bully assisters, as compared to high schoolers. Bully assisting may be viewed as a more normative response to bullying in high school. As identity and social awareness develop in adolescence, such that by high school students these features tend to be more crystallized (Blakemore & Choudhury, 2006), high school students may engage in more bully assisting behavior as a result of their need to feel accepted by others.

**Victim Defending**

Victim defending behaviors were significantly positively associated with connectedness and resources, suggesting that students' positive experiences with their school were associated with helpful and prosocial responses to witnessing bullying. This suggests that students who feel more connected to their school social environment may be more likely to want to help end bullying when they witness it. It is also consistent with previous studies that have shown that adults who feel connected to their school are more likely to intervene (Bradshaw et al., 2013; O'Brennan et al., 2014). Prior research indicating that victim defenders are more likely to engage in social support seeking (Pozzoli & Ginni, 2010) is consistent with our finding that perceived access to resources

was associated with victim defending. Overall, our results suggested that students' perceptions of their school may play a role in influencing youths' willingness to engage in defending behaviors (see Bradshaw, 2017; Bradshaw, Waasdorp, O'Brennan, & Gulemetova, 2013). Internalizing behaviors were also significantly associated with victim defending behavior, a finding that is consistent with previous research (Pozzoli & Ginni, 2010). Future research should examine the specific types of defending behaviors that are associated with the internalizing symptoms. For example, it is possible that youth who endorse internalizing symptomology are more likely to provide comfort to the victim or tell an adult, rather than actively attempting to stop the bullies. Youth who were previously bullied themselves were almost three times as likely to report victim defending behaviors, suggesting that this experience may increase empathy for the victim and make students more likely to intervene (Barchia & Bussey, 2011). Another possible mechanism could be that students who were previously bullied were more likely to notice bullying situations, creating more opportunities to use defending behavior (Jenkins & Nickerson, 2017). Lastly, middle school students had higher odds of defending the victim compared to high school students, consistent with other research finding that high school students are less likely to engage in defending behaviors (Polanin et al., 2012).

**Outsider Behavior**

Students who experienced internalizing symptoms also had significantly higher odds of reporting outsider behaviors in response to witnessing bullying. Students who experience internalizing symptoms may not have the cognitive resources to allow for sharing of others' experiences, indicating some support for findings in previous research regarding outsider behaviors (Pozzoli & Gini, 2010). Interestingly, externalizing

symptoms were also associated with increased odds of reporting outsider behaviors, suggesting that mental health symptoms may increase likelihood of passive response to bullying. Students who had been previously bullied had twice the odds of behaving as outsiders; future research could examine whether this could be explained by fear of being victimized themselves.

**Limitations and Future Directions**

There are inherent limitations to self-report data, including differences between how adolescents *report* they respond, and how they *actually* respond. For example, in observational studies with bystander behaviors, students' actual levels of defending were lower than their reported levels of defending (Bellmore, Ma, You, & Hughes, 2012). Nonetheless, surveys administered online and anonymously, as the current survey was, have been shown to reduce social desirability bias (e.g., Krumpal, 2013).

While a strength of this study was the opportunity to explore overlap in response options, there were some limitations to the measurement of these experiences. For example, the response to witnessing variables asked students what they *usually* do when they witness bullying, which may have introduced bias. Yet a sizable portion of students (36.7%) did not indicate using any of the bystander responses listed. Although it is unknown whether these students would have endorsed outsider behaviors, prior research suggests that a passive or non-response (i.e., simply doing nothing) is common when it comes to youth witnesses to bullying (Waasdorp & Bradshaw, 2018). Thus, we retained the full sample of students in these analyses, as a student's non-response may be informative. We also opted to retain who indicated that they had not previously witnessed bullying. To further explore this issue, we conducted sensitivity analyses on those

students who witnessed bullying and found that the overall pattern of findings did not differ from the full sample. Therefore, we reported the findings for full sample, as we believed this approach to be most inclusive and conservative to issues of potential response bias and increase potential for generalizability of the findings. In order to account for diversity and overlap in responses, we used a dichotomous approach for each of the three predominant patterns of responses to witnessing bullying. This allowed us to gain further insight regarding the full spectrum of behavioral responses to witnessing bullying, without excluding students who endorsed multiple types of witness responses. However, this approach precluded us from accounting for levels of endorsement or predominate endorsement of one type of response. Future research could explore these aforementioned concerns using other approaches, such as latent profile analysis (see Waasdorp & Bradshaw, 2018). Another important limitation of the study was the cross-sectional design, which precluded exploration of causal associations or potential mechanisms which may mediate these associations. Although the sample size was quite large and relatively diverse, all participants were nested within Maryland schools. It is unknown if these results would be comparable in other areas of the state or country, or to elementary school students. Additionally, this study was based on secondary data analysis of data collected by the schools on behalf of the state, and as such, we do not know the exact response rates of students or schools. Although we accounted for the nesting of participants within schools by adjusting the standard errors, future research could employ a multi-level modeling to examine additional factors at the classroom and school levels that may be associated with different responses to witnessing bullying (Pozzoli et al., 2012). Finally, we did not have information on type of bullying witnessed

(e.g., cyber, relational, verbal, physical), and thus could not link specific responses with particular forms of bullying witnessed; different patterns could emerge when exploring bystander behaviors in relation to specific types of bullying.

**Conclusions and Implications**

Generally, outsiders were more similar to victim defenders, as opposed to bully assisters, on predictor variables including internalizing behavior, externalizing behavior, and previous victimization experience. This seems to support previous research suggesting that outsiders and victim defenders can have similar prosocial profiles of empathy (Gini et al., 2008). It is possible that low self-efficacy inhibited their use of defending behavior; therefore, prevention efforts could focus on promotion of self-efficacy to optimize more favorable and active bystander responses (Gini et al., 2008). Moreover, some research shows that outsiders have anti-bullying attitudes, which differentiates them conceptually from bully assisters (Olthof & Goossens, 2008). Although the victims may view outsiders unfavorably, it is important to further explore outsider behaviors, as the mechanisms for their behavior are likely quite different from assisters, given their anti-bullying attitudes (Gini et al., 2008). For example, whereas additional efficacy and skill development may be needed to prompt passive outsiders to respond more positively and actively, bully assisters may need programming which addresses their own aggressive behavior and attitudes favoring bullying, reducing their likelihood of an aggressive response to witnessing bullying (Gini et al., 2008).

Our results revealed that connectedness and access to resources were associated with more favorable or prosocial responses to witnessing bullying, like defending the victim. This suggests that perceptions of school connectedness may be a factor to

promote when implementing bystander-focused preventive interventions. Schools may want to consider implementing school climate promoting efforts, like Positive Behavioral Interventions and Supports, which has also shown to reduce bullying (Waasdorp, Bradshaw, & Leaf, 2012), as these approaches may also increase bystander behavior and shift norms about responses to bullying. Moreover, bullying prevention programming could increase awareness of the harms associated with bullying, promote effective interventions, and help youth feel more comfortable using defending behaviors (Polanin et al., 2013).

The findings on externalizing symptoms suggest that processes such as impulsivity and lack of emotional control may increase the chances of students perpetuating bullying by encouraging it. Knowledge about this potential risk factor can help educators and policy makers target youth who engage in these behaviors in formal and informal intervention (Polanin et al., 2012). Prevention efforts could target students who experience anger or impulsivity, or have related diagnoses to decrease prevalence of youth who respond aggressively to witnessing bullying. The link between previous victimization experience and all three types of response patterns identified in this study suggests that students' personal experiences as victims may influence their response to witnessing peers being bullied. It is noteworthy that students who were previously victimized had higher odds of reporting victim defending *and* bully assisting, suggesting a complex mix of responses (see Waasdorp & Bradshaw, 2018). Future research could further explore what characteristics are associated with victim defending versus bully assisting among students who have been previously victimized, as these witnesses may not know how best to respond. Taken together, these results suggest that psychological

factors, as well as feelings of school connectedness and access to resources, could influence students' likelihood of intervening on behalf of a victim. As such, these findings may inform future research and the use of bystander-focused preventive interventions in secondary schools.

References

American Association for Public Opinion Research. 2016. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 9th edition. Available at http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf . Accessed May 3, 2017.

Barchia, K., & Bussey, K. (2011). Predictors of student defenders of peer aggression victims: Empathy and social cognitive factors. *International Journal of Behavioral Development*, *35*(4), 289-297.

Bellmore, A., Ma, T. L., You, J. I., & Hughes, M. (2012). A two-method investigation of early adolescents' responses upon witnessing peer victimization in school. *Journal of Adolescence*, *35*(5), 1265-1276.

Blakemore, S. J., & Choudhury, S. (2006). Development of the adolescent brain: implications for executive function and social cognition. *Journal of child psychology and psychiatry*, *47*(3-4), 296-312.

Bradshaw, C. P. (Ed.). (2017). *Handbook on Bullying Prevention: A Lifecourse Perspective.* New York: National Association of Social Workers Press.

Bradshaw, C. P., Sawyer, A. L., & O'Brennan, L. M. (2007). Bullying and peer victimization at school: Perceptual differences between students and school staff. *School Psychology Review*, *36*(3), 361-382.

Bradshaw, C.P., Waasdorp, T.E., Debnam, K.J., & Lindstrom Johnson, S. (2014). Measuring school climate: A focus on safety, engagement, and the environment. *Journal of School Health, 84,* 593-604. DOI: 10.1111/josh.12186

Bradshaw, C. P., Waasdorp, T. E., O'Brennan, L., & Gulemetova, M. (2013). Teachers' and education support professionals' perspectives on bullying and prevention: Findings from a National Education Association (NEA) survey. *School Psychology Review, 42,* 280-297.

California Department of Education. (2010). California Healthy Kids Survey. Retrieved from http://chks.wested.org/administer/download.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*(5), 1185-1229.

Cook, C. R., Williams, K. R., Guerra, N. G., Kim, T. E., & Sadek, S. (2010). Predictors of bullying and victimization in childhood and adolescence: A meta-analytic investigation. *School Psychology Quarterly, 25*(2), 65-83.

Cowie, H. (2014). Understanding the role of bystanders and peer support in school bullying. *The International Journal of Emotional Education, 6*(1), 26-32.

Epps, S. R., Park, S. E., Huston, A. C., & Ripke, M. (2005). A scale of positive social behaviors. In *What Do Children Need to Flourish?* (pp. 163-179). Springer US.

Espelage, D. L., & Swearer, S. M. (Eds.). (2004). *Bullying in American schools: A social-ecological perspective on prevention and intervention*: Lawrence Erlbaum.

Gini, G., Albiero, P., Benelli, B., & Altoe, G. (2008). Determinants of adolescents' active defending and passive bystanding behavior in bullying. *Journal of Adolescence, 31*(1), 93-105.

Gini, G., Pozzoli, T., Borghi, F., & Franzoni, L. (2008). The role of bystanders in students' perception of bullying and sense of safety. *Journal of School Psychology, 46*(6), 617-638.

Gladden, R. M., Vivolo-Kantor, A. M., Hamburger, M. E., & Lumpkin, C. D. (2014). *Bullying surveillance among youths: Uniform definitions for public health and recommended data elements.* Atlanta, GA.: Centers for Disease Control and Prevention and U.S. Department of Education.

Hanson, T. L., & Kim, J. O. (2007). *Measuring resilience and youth development: The psychometric properties of the Healthy Kids Survey.* (REL 2007– No. 034). Washington, DC: U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/edlabs.

Janson, G. R., & Hazler, R. J. (2004). Trauma reactions of bystanders and victims to repetitive abuse experiences. *Violence and Victims, 19,* 239–255.

Jenkins, L. N., & Nickerson, A. B. (2017). Bullying participant roles and gender as predictors of bystander intervention. *Aggressive behavior*, *43*(3), 281-290.

Kärnä, A., Voeten, M., Poskiparta, E., & Salmivalli, C. (2010). Vulnerable children in varying classroom contexts: Bystanders' behaviors moderate the effects of risk factors on victimization. *Merrill-Palmer Quarterly, 56,* 261-282.

Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: A literature review. *Quality & Quantity*, *47*(4), 2025-2047.

Lagerspetz, K. M. J., & Bjorkqvist, K. (1994). Indirect aggression in boys and girls. In L. R. Huesmann (Ed.), *Aggressive behavior: Current perspectives*, 131 – 150. New York: Plenum Press.

Morin, H. K., Bradshaw, C. P., & Kush, J. M. (2018). Adjustment outcomes of victims of cyberbullying: the role of personal and contextual factors. *Journal of School Psychology, 70,* 74-88.

O'Brennan, L., Waasdorp, T. E., & Bradshaw, C. P. (2014). Strengthening bullying prevention through school staff connectedness. *Journal of Educational Psychology, 106,* 870-880. doi: 10.1037/a0035957

O'Connell, P., Pepler, D., & Craig, W. (1999). Peer involvement in bullying: Insights and challenges for intervention. *Journal of Adolescence, 22*, 437–452.

Olthof, T., & Goossens, F. A. (2008). Bullying and the need to belong: Early adolescents' bullying-related behavior and the acceptance they desire and receive from particular classmates. *Social Development*, *17*(1), 24-46.

Polanin, J. R., Espelage, D. L., & Pigott, T. D. (2012). A meta-analysis of school-based bullying prevention programs' effects on bystander intervention behavior. *School Psychology Review*, *41*(1), 47-65.

Polanin, J. R., Espelage, D. L., & Pigott, T. D. (2013). A meta-analysis of school-based bullying prevention programs' effects on bystander intervention behavior. *School Psychology Review, 41*(1), 47-65.

Pöyhönen, V., Juvonen, J., & Salmivalli, C. (2010). What does it take to stand up for the victim of bullying?: The interplay between personal and social factors. *Merrill-Palmer Quarterly*, *56*(2), 143-163.

Pozzoli, T., & Gini, G. (2010). Active defending and passive bystanding behavior in bullying: The role of personal characteristics and perceived peer pressure. *Journal of*

*Abnormal Child Psychology, 38,* 815–827.

Pozzoli, T., & Gini, G. (2013). Why do bystanders of bullying help or not? A multidimensional model. *Journal of Early Adolescence, 33,* 315–340.

Pozzoli, T., Gini, G., & Vieno, A. (2012). The role of individual correlates and class norms in defending and passive bystanding behavior in bullying: A multilevel analysis. *Child Development, 83*(6), 1917-1931.

Reynolds, C. R., & Kamphaus, R. W. (2004). BASC-2: Behavioral assessment system for children manual (2nd ed.). CirclePines, MN: AGS.

Rigby, K. (2000). Effects of peer victimization in schools and perceived social support on adolescent well-being. *Journal of Adolescence, 23*(1), 57-68.

Rivers, I., Poteat, V. P., Noret, N., & Ashurst, N. (2009). Observing bullying at school: The mental health implications of witness status. *School Psychology Quarterly, 24*(4), 211-223.

Salmivalli, C. (2010). Bullying and the peer group: A review. *Aggression and Violent Behavior, 15*(2), 112-120.

Salmivalli, C., Lagerspetz, K., Björkqvist, K., Österman, K., & Kaukiainen, A. (1996). Bullying as a group process: Participant roles and their relations to social status within the group. *Aggressive Behavior, 22*(1), 1-15.

Salmivalli, C., Huttunen, A., & Lagerspetz, K. M. (1997). Peer networks and bullying in schools. *Scandinavian Journal of Psychology, 38*(4), 305-312.

Salmivalli, C., Voeten, M., & Poskiparta, E. (2011). Bystanders matter: Associations between reinforcing, defending, and the frequency of bullying behavior in the classroom. *Journal of Clinical Child and Adolescent Psychology, 40,* 668-676.

Salmivalli, C., & Voeten, M. (2004). Connections between attitudes, group norms, and behaviour in bullying situations. *International Journal of Behavioral Development, 28*(3), 246-258.

Salzinger, S., Rosario, M., Feldman, R. S., & Ng-Mak, D. S. (2008). Aggressive behavior in response to violence exposure: is it adaptive for middle-school children?. *Journal of Community Psychology, 36*(8), 1008-1025.

Trach, J., Hymel, S., Waterhouse, T., & Neale, K. (2010). Bystander responses to school bullying: A cross-sectional investigation of grade and sex differences. *Canadian Journal of School Psychology, 25,* 114-130.

Waasdorp, T.E. & Bradshaw, C.P. (2018). Examining variation in adolescent bystanders' responses to bullying. *School Psychology Review, 47,* 18–33. DOI: 10.17105/SPR-2017-0081.V47-1.

Waasdorp, T. E., Bradshaw, C. P., & Leaf, P. J. (2012). The impact of School-wide Positive Behavioral Interventions and Supports (SWPBIS) on bullying and peer rejection: A randomized controlled effectiveness trial. *Archives of Pediatrics and Adolescent Medicine, 116*(2), 149-156. doi: 10.1001/archpediatrics.2011.755.

Table 1

*Student and School Characteristics (N=57,314)*

| Sex of Participants | N (%) |
|---|---|
| Female | 29,039 (50.7%) |
| Male | 28,275 (49.3%) |
| Race/ethnicity of Participants | |
| White | 28,993 (50.6%) |
| Latinx | 5,321 (9.3%) |
| Black | 14,045 (24.5%) |
| Asian | 3,156 (5.5%) |
| Other | 5,799 (10.1%) |
| School Level | |
| Middle School | 25,659 (44.8%) |
| High School | 31,655 (55.2%) |
| Free and Reduced Cost Meals Rate (%) | 35.6% |
| % Enrollment Minority | 47.2% |
| Average School Enrollment | 1,148 Students |

Table 2

*Pearson Correlation Coefficients Matrix for Bystander Behavior Response Options (N=57,314), with Percentage of Participants Endorsing Each Form Provided along the Diagonal.*

| | Assister | | | Outsider | | Defender | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Watch | Join In | Laugh At | Stay Out | Ignore | Stop Bully | Comfort | Tell Teacher | Tell Adult |
| Watch | 7.6% | | | | | | | | |
| Join In | .305** | 2.1% | | | | | | | |
| Laugh At | .346** | .473** | 3.8% | | | | | | |
| Stay Out | .163** | .075** | .099** | 23.7% | | | | | |
| Ignore | .246** | .153** | .191** | .251** | 11.9% | | | | |
| Stop Bully | -.003 | .067** | .057** | .096** | -.016** | 25.5% | | | |
| Comfort | .018** | .065** | .054** | .160** | .030** | .407** | 22.5% | | |
| Tell Teacher | .005 | .072** | .039** | .140** | .016** | .349** | .506** | 18.4% | |
| Tell Adult | -.029** | .053** | .018** | .079** | -.016** | .282** | .366** | .505** | 18.4% |

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

Table 3

*Combined Logistic Regression Results Examining Associations for Three Bystander Responses (N=57,314)*

| | Assisting The Bully AOR | Defending the Victim AOR | Passive Outsider AOR |
|---|---|---|---|
| Individual Factors | | | |
| Internalizing Symptoms | 1.015 | 1.382*** | 1.134*** |
| Externalizing Symptoms | 1.690*** | 0.959** | 1.028* |
| Previously Bullied | 1.837*** | 2.863*** | 2.158*** |
| School Factors | | | |
| Connectedness | 0.771*** | 1.252*** | 0.876*** |
| Services and Resources | 0.737*** | 1.147*** | 0.905*** |
| Demographics | | | |
| Latinx | 1.333*** | 0.927* | 0.855*** |
| Asian | 1.737*** | 0.894** | 1.065 |
| Black | 1.480*** | 0.903*** | 0.926** |
| Other Race/Ethnicity | 1.354*** | 0.977 | 0.867*** |
| Male | 1.437*** | 0.566*** | 0.791*** |
| Middle School | 0.824*** | 1.511*** | 1.070** |

* $p < .05$, ** $p < .01$, , *** $p < .001$. AOR = adjusted odds ratio

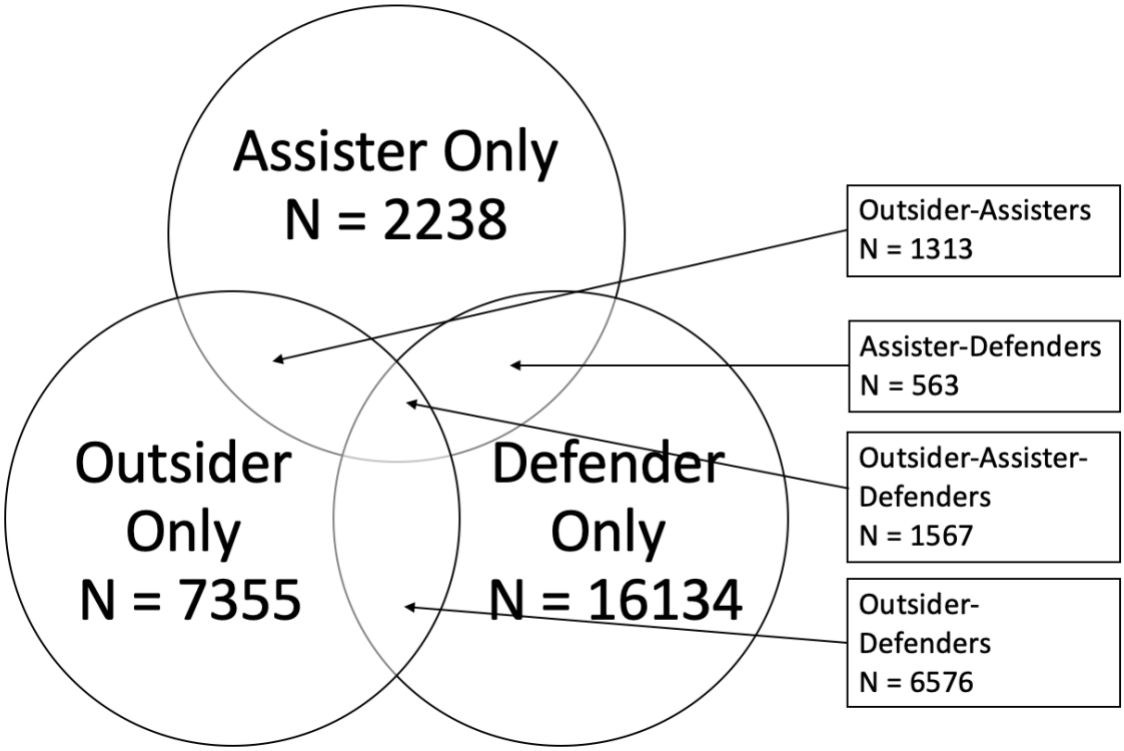



*Figure* 1. Overlap of response patterns to witnessing bullying (*n* = 35,746). Those who did not endorse any of the bystander response options (*n* = 21,568) are excluded from this diagram. Total *N= 57,314.*

Figure 2

*Percent of Bystander Behaviors in Sample (N= 57,314)*

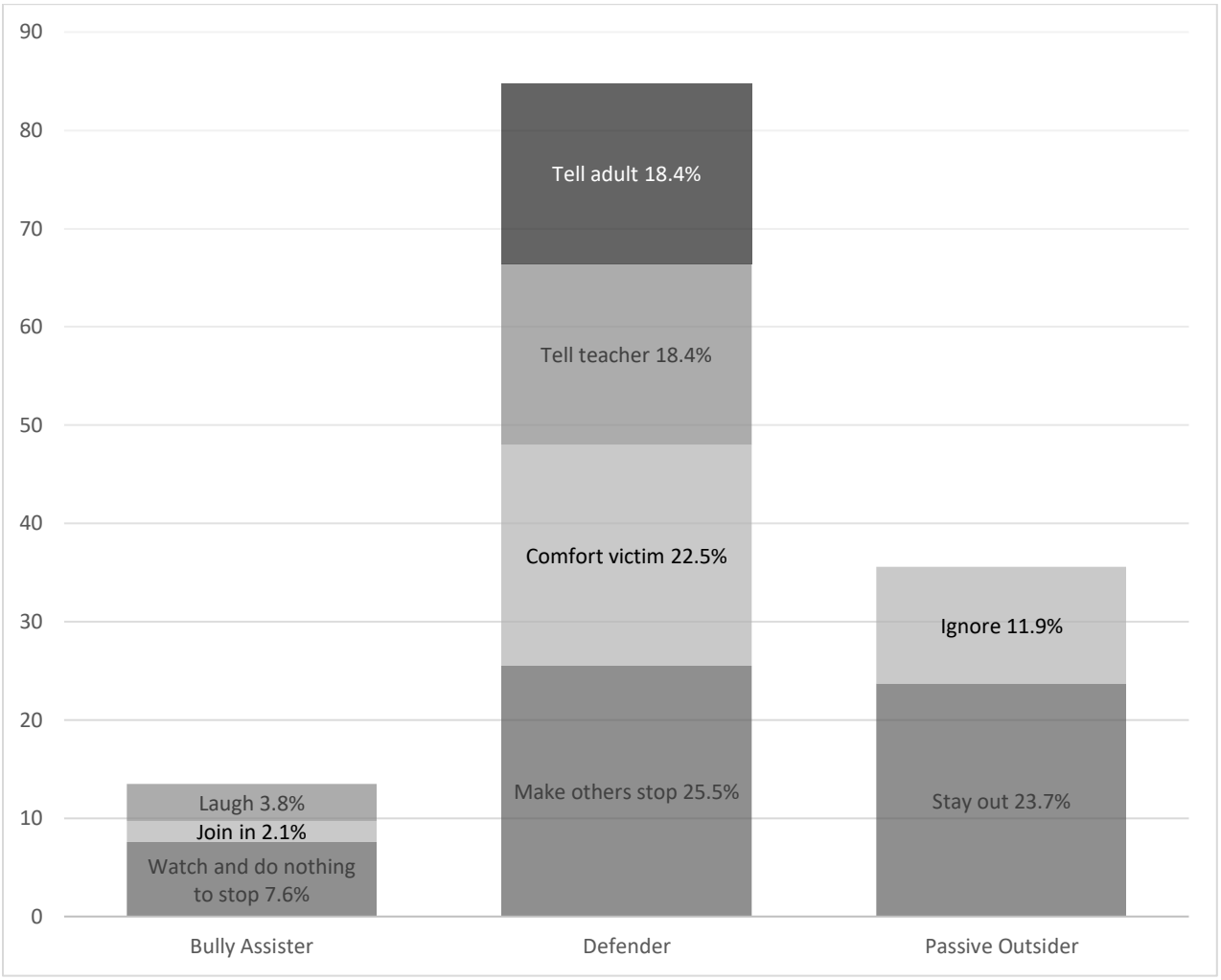


Figure 3a
*Gender Breakdown by Bystander Behavior (N = 57,314)*

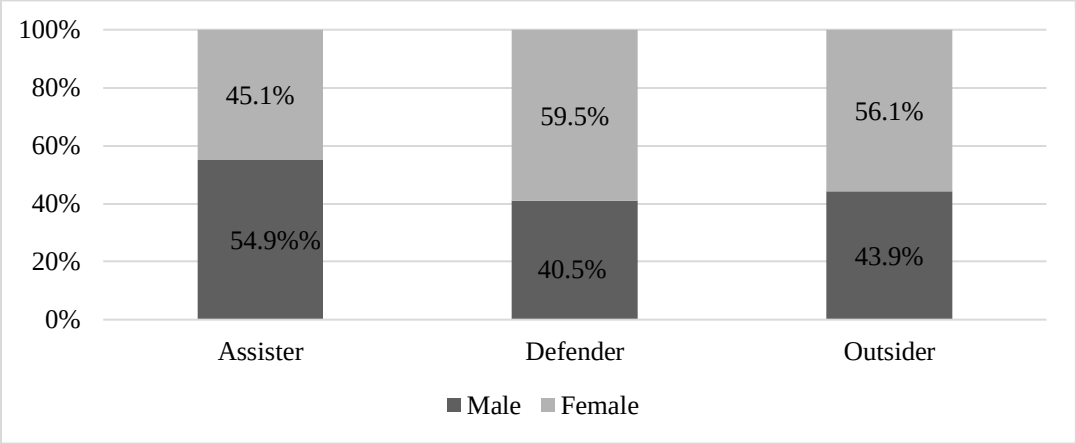



Figure 3b
*Grade Breakdown by Bystander Behavior (N = 57,314)*

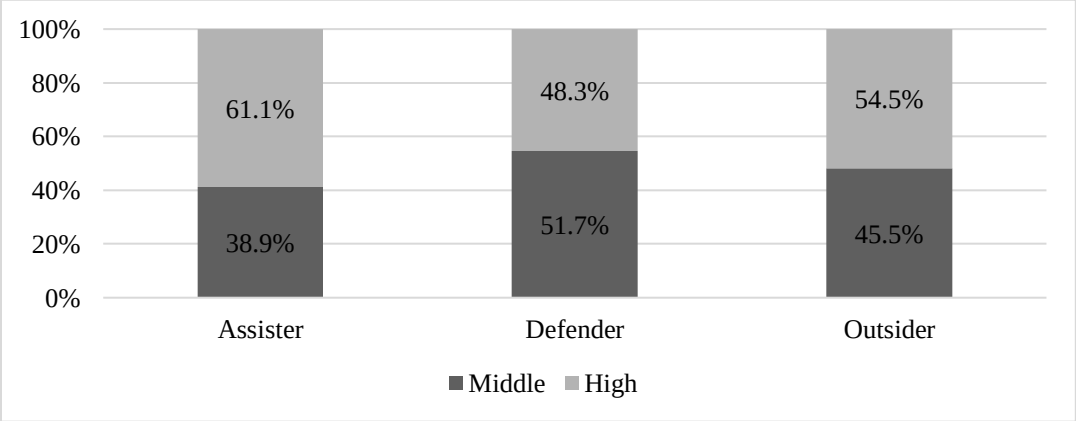
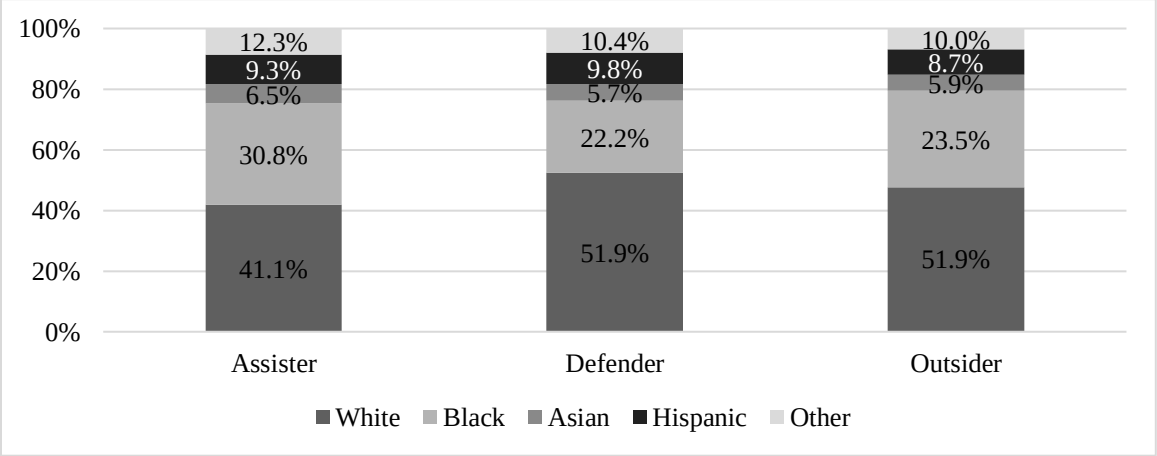



Figure 3c
*Race Breakdown by Bystander Behavior (N = 57,314)*



**Manuscript 3**

# Neuropsychological and Cognitive Aspects of Bullying: Exploring the Role of Select Executive Functions and Social Information Processing

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Abstract

Early adolescence marks a time of developmental changes that affect youth in many contexts. During this developmental phase, the risk for bullying involvement peaks, as compared to elementary and high school years. Despite this, the extant literature is lacking in exploration of cognitive and neuropsychological processes that may serve as risk factors for bullying perpetration. Examining these factors is important as it can help inform bullying intervention and prevention efforts by targeting these underlying processes. The current study leveraged baseline data from an on-going study of 280 students within middle schools in Maryland to examine predictors of direct and indirect bullying. Analyses drew upon data from primarily low-income minority students who were identified by their teachers as having high levels of aggressive behavior. We used self-reported data as well as performance task data of executive functioning and social information processing to examine the associations among these processes in relation to direct and indirect bullying. Analyses showed significant associations between both performance and self-report variables on the outcomes of direct and indirect bullying. Specifically, students with stronger planning and reasoning skills had higher odds of direct bullying. Additionally, better emotion understanding and social perception was associated with less direct and indirect bullying. Together, these findings help inform our understanding of the potential link between social-cognitive and neuropsychological aspects of bullying.

## Neuropsychological and Cognitive Aspects of Bullying:
## Exploring the Role of Select Executive Functions and Social Information Processing

Early adolescence is a unique developmental stage in which youth experience considerable changes, particularly within the cognitive, social, neuropsychological, and moral domains. This period is often difficult for parents, teachers, and youths due to the complexity of the developmental changes that occur. One challenge that presents during middle school years is an increase in the risk of bullying, which is defined as an aggressive behavior that occurs within interpersonal relationships that is intentional, repetitive, and characterized by an imbalance of power (Olweus, 1993; Gladden, Vivolo-Kantor, Hamburger, & Lumplkin, 2014). Bullying typically reaches a peak in the middle school years, and declines thereafter (Kljakovic & Hunt, 2016). Given the host of well-documented negative outcomes linked with this behavior (for a review see National Academies of Sciences, Engineering, & Medicine, 2019), it is important to understand factors associated with bullying and apply this knowledge to prevention and intervention efforts. It is especially critical to study bullying perpetration within the middle school context because children who are aggressive in the middle school years are at increased risk of conduct problems in the high school years (Ttofi & Farrington, 2011; Lochman, 1992). Additional attention focused on reducing bullying behaviors during middle school has the potential to alter trajectories for both youth who bully and those who are victims.

The etiology and trajectory of bullying behavior is complex. In terms of trajectory, bullying, as mentioned above, peaks during middle school with a steady decrease in high school. However, some bullies continue to carry out their acts of aggressive behavior in post-secondary education and in the workplace (Bradshaw, 2017). With regard to etiology, there are numerous predictors of bullying perpetration. Well documented individual predictors of bullying include externalizing symptoms, internalizing symptoms, social competence, scholastic concerns, negative attitudes towards self and others, and poor conflict resolutions skills (Cook, Williams, Guerra, Kim, & Sadek, 2010). Environmental predictors of bullying include high familial conflict, low parental monitoring, negative perceptions of school climate, and peer group (Cook et al., 2010). In sum, when considering etiology it appears that both environmental, temperamental, and genetic factors play a role in prediction of bullying. In adolescence, bullying forms include physical, verbal, relational, and cyber (Wang, Iannotti, & Nansel, 2009). Direct forms of bullying include physical (e.g., hitting, slapping, pinching) and verbal (e.g., teasing, name calling) aggression, whereas relational bullying (e.g., exclusion, rumor spreading) is considered indirect. Cyberbullying, which is defined as bullying on an online platform perpetrated against a vulnerable individual, is typically considered an indirect form of bullying (Kowalski, Limber, & Agaston, 2012).. Factory analysis of bullying behavior generally supports separation into two distinct forms: direct and indirect bullying (Card et al., 2008). Additionally, bullying is generally considered to be a form of proactive aggression, as opposed to reactive aggression

Gender differences are well-documented in the bullying literature. Males tend to use physical aggression, a form of direct bullying, more often than females (Card et al.,

2008; Maccoby & Jacklin, 1974). This finding is robust, which is rare when examining sex differences in direct and indirect aggression, as the literature is often inconsistent. A meta-analytic review revealed that males engaged in direct aggression more often than females, while males and females engaged in similar levels of indirect aggression. The indirect aggression findings were stable across ages (Card, Stucky, Sawalni, & Little, 2008). This finding of negligible gender differences in the perpetration of indirect aggression also has support from a meta-analytic review by Archer (2004), suggesting that this is a robust finding.

In middle school, there is a notable increase in youths' use of relational aggression (Bradshaw, Sawyer, & O'Brennan, 2007). Given the developmental context, the uptick in prevalence and shift in forms of bullying are likely associated with changes that occur in the early adolescent years. Yet, knowledge of the risk factors for perpetrators of bullying is often limited to self-report, peer nomination, and teacher report (Card et al., 2008). Additionally, many of these studies focus on adjustment issues and lack more nuanced views of development or underlying cognitive processes. While data on youth adjustment is valuable and considerably less burdensome to collect (i.e., can be observed and reported on by parents, teachers, and peers), there remain several questions regarding the underlying processes that may contribute to bullying (Camodeca & Goosens, 2005; Jenkins, Tennent, & Demaray, 2018). However, more objective methods of studying bullying, such as naturalistic observation, are time-consuming and expensive, presenting a burden to researchers. Subsequently, there is a paucity of studies that include objective measures of risk factors for perpetration of direct and indirect bullying in middle school contexts.

Despite well documented limitations of self-report data, coupled with the immense changes that middle schoolers experience, it is surprising that so few studies have utilized performances based measures to understand processes that underlie bullying in middle school. Specifically, Social information processing (SIP) and executive functioning (EF) are two domains that undergo significant changes in the middle school years (Crick and Dodge, 1994; Diamond, 2013). In fact, these intricate processes have been linked with one another, with EF ostensibly influencing the SIP model at various stages (Camodeca & Goosens, 20005; Jenkins et al., 2018). SIP appears to relate to the executive system, through the utilization, or lack thereof, of executive functions; these executive functions include cognitive flexibility, inhibition, selective attention, and complex problem solving (Ellis, Weiss, & Lochman; Jenkins et al., 2018; Zelazo, Carter, Reznick & Frye, 1997) at various stages of SIP processing. Research thus far has largely studied these constructs within the context of aggression (often reactive) and has produced robust findings (e.g., Anderson, 2002; Ellis et al., 2009). However, there is a dearth of literature examining these constructs as they are specifically associated with bullying. The current study aimed to examine the associations between direct and indirect bullying with executive functioning and social information processing.

**Executive Functioning**

Executive functioning (EF) has been defined as "those capacities that enable a person to engage successfully in independent, purposive, self-directed, and self-serving behavior," (Lezak, Howieson, Bigler, & Tralel, 2012, p. 37) and are comprised of multiple subroutines that work together in services of goal-directed behavior (Lezak et al., 2012). Anticipation, planning, goal selection, cognitive flexibility, initiation,

planning, and inhibition are examples of different executive functions. These processes rely heavily on frontal lobe activity, especially within the prefrontal cortex (PFC) and assist in social functioning. Other areas of the brain, including both cortical and subcortical structures, such as the brain stem, temporal lobes, parietal lobes, and limbic system (Barbas & Zikopoulos, 2007; Stuss & Alexander, 2000) are also implicated in EF, especially in their communication and connection with frontal networks (Kolb & Whishaw, 2009).

There is a general consensus in the literature that there are three core executive functions: Inhibition, working memory, and cognitive flexibility (e.g., Diamond, 2013; Miyake et al., 2000; Miyake & Friedman, 2012), though debate remains around this topic. These three EFs are considered "higher order", and are built upon "lower order" EFs such as planning, information processing, and reasoning (Diamond, 2013). In other words, the higher order EFs cannot function optimally without the lower order EFs. Executive functions are implicated in complex social interactions, which ostensibly includes bullying. The executive functions of particular relevance to bullying perpetration include inhibition, planning, and complex reasoning (i.e., cognitive flexibility), given the importance of these skills in overall social functioning (Ellis et al., 2009; Jenkins et al., 2018; Verlinden et al., 2014).

Inhibition includes the ability to actively refrain from an automatic or impulsive response in favor of an appropriate response through the control of attention, behavior, thoughts and emotions (Diamond, 2013). Therefore, it can be understood as the process of controlling automatic responses in favor of more acceptable and optimal responses. Youth with poor inhibition often speak or act without thinking or planning, which can

result in suboptimal social functioning including aggression (Anderson, 2008; O'Toole, Monks, & Tsermentseli, 2017). The current study examined impulse inhibition and planning through a performance test of executive function, and examined associations with bullying. Hyperactivity and impulsivity are also related to EF (Toblin et al., 2005); in our study, this was examined through teacher-report measure and performance measures. Cognitive inhibition, self-control, and impulse control are also subroutines of inhibition; we assessed these constructs through performance measures (Diamond, 2013; Naglieri & Goldstein, 2013).

Cognitive flexibility, including planning and complex reasoning, involves skills such as spatial perspective changing, interpersonal perspective changing, and adjustment to changing task or environmental demands (Diamond, 2013; Naglieri & Goldstein, 2013). Cognitive flexibility, planning, and reasoning are crucial skills in optimal social functioning. For example, social interactions often require flexibility of thinking to consider others' points of view (O'Toole, Monks, & Tsermentseli, 2017). Planning and complex reasoning were assessed through performance measures in this study.

**Executive functioning in early adolescence.** It is important to understand how executive functioning develops in early adolescence before discussing EFs as they relate to bullying. Overall, executive functions develop as a function of brain development, particularly in the frontal lobes and prefrontal cortex. With that said, environmental and medical factors that affect brain development can certainly impact executive functions. For example, prematurity, low birthweight, and in utero substance exposure have well established associations with later diagnoses of ADHD and executive dysfunction (Booth, 2016). Additionally, lack of environmental stimulation in infancy and

toddlerhood (e.g., excessive screen time, early childhood neglect) is associated with lower IQ scores and subsequent EF concerns. Isolated executive functions begin to develop as early as infancy and continue to develop throughout childhood and into early adulthood (Anderson, 2002; Diamond, 2013). During adolescence, the brain goes through many developmental changes, some of which take place in the PFC (Bishop, Aamodt-Leeper, Creswell, McGurk, & Skuse, 2001). Given that executive functions are comprised of multiple processes that work both in isolation and hierarchically, the development of these skills does not happen uniformly. Rather, as the brain changes structurally, functional changes occur as well, including the development of EF (Brocki & Bohlin, 2004). A "growth spurt" in the frontal lobes, whereby frontal lobe connections increase in number and strength, occurs between ages 11-13, according to imaging data; this results in rapid development of many executive subroutines (Hudspeth & Pribam, 1990). Importantly, frontal development in females tends to occur at an earlier rate than frontal development in males. During adolescence, EF has not reached full maturation, which may become a risk factor for adolescents' involvement in problematic social interactions, including bullying.

With regard to development of inhibition, subroutines of self-monitoring and self-regulation increase in development around age 9. This is interrupted by a period increased impulsivity developing around age 11 (Anderson, Anderson, & Lajoie, 1996). Ages 11-12 are associated with improvements in processing speed and information processing (Kail, 1986). Perseverative behavior, a hallmark of infancy, steadily declines thereafter and rarely occurs by adolescence (Welsh, Satterlee-Cartmell, & Stine, 1999). The ability to fluidly switch between mental sets improves in adolescence, as does the

ability to incorporate feedback and learn from mistakes (Anderson, 2002; Anderson, 2008). Children ages 7-11 experience advances in reasoning and planning abilities (Anderson, 2002). However, at ages 12-13, children tend to regress in their newly improved planning and organizational skills (Anderson, 2008; Brocki & Bohlin, 2004). Overall, the frontal lobes increase in white matter connections during adolescence (Tamnes et al., 2009). Continued research on these functions in the middle school context may inform our understanding of the neuropsychological processes that underlie adolescents' aggressive behavior, including bullying.

**Executive functioning and bullying.** Executive functioning has frequently been studied in the context of aggression and other externalizing behaviors, but research is limited with regard to bullying, especially perpetration (Verlinden et al., 2014). Current research finds consistent links between executive dysfunction and aggression as early as preschool (Monks, Smith, & Swettenham, 2005; Hughes, White, Sharpen, & Dunn, 2000). Given the evidence of a link between aggression and executive functioning (Ellis et al., 2009; Jenkins et al., 2019; Toblin et al., 2014), a similar association may also occur between bullying and executive functioning; emerging evidence supports this link(Jenkins et al., 2019). From a neuropsychological perspective, emotion regulation (e.g., aggression) and some executive functions occur in the PFC, meaning these functions share the same structure in the brain (Giancola, 1995). EFs and emotion regulation are also theorized to be associated behaviorally, a finding that was supported in a study of preschool children (Monks et al., 2005).

In addition, associations have been found between inhibition and emotion regulation where poor inhibition and emotional regulation predicted overt aggression in

youth (Carolson & Wang, 2007). For example, a study of 9-12-year-old males examined specific executive routines (i.e., inhibition, planning, and set shifting), measured by multiple objective executive function assessments in relation to aggression (Ellis et al., 2009). Reactive aggression was associated with low levels of inhibition and planning, suggesting a link between diminished executive functions and aggressive behavior, supporting prior theory (Ellis et al., 2009; Kempes, Matthys, De Vries, & Engeland, 2005). Proactive aggression was not associated with these executive functioning measures (Ellis et al., 2009). Subsequent work found links between working memory, set shifting, planning, and inhibition with relation to bullying, though this link has most often been identified within the context reactive aggression (Coolidge, DenBoer, & Segal, 2004; Granvald & Marciszko, 2016). Due to this, these findings are limited in that bullying often occurs as a form of proactive aggression. The aforementioned skills are highly related to development of the frontal lobes (Tamnes et al., 2009), suggesting frontal lobe involvement in acts of aggression and bullying.

In fact, it has been theorized that the frontal lobes are implicated in the perpetration of bullying (Grigsby & Stevens, 2000). According to this framework, the lack of maturation or function of the frontal lobes is associated with disinhibition of impulses, which in turn leads to physical and verbal acts of aggression (Grigsby & Stevens, 2000). Support for this hypothesis was provided in a sample of middle school boys who were identified as engaging in direct forms of bullying (e.g., verbal and physical). Findings revealed that bullies had significantly more trouble with decision making, planning, organizing, learning and integrating information, and making appropriate social decisions when compared to healthy controls (Coolidge et al., 2004).

Although there were no objective measures of EF used in that study (e.g., parent reports were used), the findings provided evidence for an association between bullying and EF, suggesting that impairments with reasoning and inhibition may be associated with increased physical and verbal aggression.

Some prior work and theory of EFs and bullying have considered social cognitive factors, given the executive skills required to act appropriately in a social setting. Some researchers theorize that when executive skills are weak, children may not be able to accurately encode social inputs to make informed decisions (Mullin & Hinshaw, 2007). Specifically, hostile attribution bias has been implicated numerous times in studies of aggression or bullying and executive functioning (e.g., Carlson & Wang, 2007; Ellis et al., 2009) Inhibition has also been implicated in EF and bullying theory. For example, undesirable responses and impulses are managed through inhibition, the effective utilization of which allows the individual to choose a more favorable response. Youth who have difficulty with behavioral and verbal inhibition may be less able to control their impulses, imagine long-term consequences, and choose more appropriate behavior (Granvald & Marciszko, 2016). As such, more impulsive youth may engage in more direct forms of physical and verbal aggression.

**Social Information Processing**

Although there has been a large body of research linking SIP with aggression (Bradshaw & Gabarino, 2004; Crick & Dodge, 1994), there has been considerably less research focused on bullying specifically. Consistent with SIP, it is theorized that social behavior in children is a function of steps. The steps, in order, are encoding of internal and external cues, interpretation of cues (e.g., causal attributions, intent attributions,

evaluation of goal attainment, evaluation of past performance), clarification of goals, response access or construction, response decision (e.g., response evaluation, outcome expectations, self-efficacy evaluation, response selection), and behavioral activation (Camodeca & Goosens, 2005; Crick & Dodge, 1994). Thus, youth perceive a situation, make inferences, and then make decisions (Crick & Dodge, 1994; Ziv, Hadad, Khateeb, & Terkel-Dawer, 2014). These processes are maintained through the child's data base, which includes their memory store, acquired rules, social schemas, and social knowledge (Crick & Dodge, 1994; Ziv & Sorongon, 2011). Youths who are competent at SIP tend to accurately interpret the intention of their peers' actions and react in an accordingly appropriate manner. Conversely, distorted social information processing often leads to aggression (Bradshaw, Rogers, Ghandour, & Gabarino, 2009; Dodge & Crick, 1990; Lochman & Wells, 2002). While research on the SIP model and bullying remains in early stages, there is support in the literature that certain steps in the SIP model have stronger associations with either reactive or proactive (i.e., often associated with bullying) aggression (Dodge, Petit, McClaskey, & Brown;1986; Smithmyer, Hubbard, & Simons, 2000). As such, SIP may represent an important underlying process in bullying situations.

**Social information processing in early adolescence.** Critical social developments occur during the early adolescent years. During this period, youth become increasingly interested in peer relationships and these relationships gain value to the adolescent. Therefore, friendship is an important component to social emotional competence in adolescence (Savin-Williams & Berndt, 1990). During these years of friendship formation, SIP plays a particularly important role.

Prior to the pre-adolescent years, children's primary social interactions were within their family systems, and distortions in SIP may not be evident (Laursen & Williams, 1997; Meece & Laird, 2006). During this time, family and cultural norms around SIP influence how children react to their environment. During this time, youth may be exposed to cultural norms that consist of more aggression. Often times, this aggression serves as a protective factor in the case of unstable or unsafe living conditions. Additionally, exposure to violence is a predictor of subsequent aggression, which may explain the etiology for some distortions in SIP (Tremblay et al., 2004). In sum, distortions in SIP may originate in the home, which only serves to normalize these distortions. As youth increase engagement in various social interactions with others, negatively biased social information processing is likely to become more apparent and detrimental. For example, children who were aggressive in a grade school context and in their home may be at a higher risk of being involved in bullying instances or other aggressive behaviors as they get older (Monks et al., 2005).

**Social information processing and bullying.** A widely accepted SIP model of aggression (Crick & Dodge, 1994; Crick, Grotpeter, & Bigbee, 2002) attempts to explain the process by which youths engage in aggressive behavior. As mentioned previously, the SIP model as it applies to bullying is not well understood. Using the six-step framework described above, Crick and Dodge's (1994) model has been used to explain reactive aggression through a process of negatively biased SIP. Youths with negatively biased SIP often miss out on other cues that could better explain the person's behavior (Bradshaw & Gabarino, 2004; Crick & Dodge, 1994), resulting in misattrubutions. This process as it related to reactive and, to some extent, proactive aggression is associated with hostile

attribution bias, retaliatory beliefs, and poor emotional identification. Emerging evidence for links between negatively biased SIP and bullying have been found (Camodeca, Goossens, Schuengel, & Terwogt, 2003; Ziv, Leibovich, & Shechtman, 2013). Specifically, aspects of the SIP model including retaliatory beliefs and outcome expectations, have been linked to proactive aggression (Dodge et al., 1997; Smithmyer et al., 2000).

**Hostile attribution bias and emotional attribution.** As noted above, processes within the SIP model are less well understood in the context of bullying. Overall, aggressive youth with poor SIP tend to hold well-developed hostile attribution biases. That is, they make hostile interpretations of ambiguous events, which in turn lead them to respond with aggression (Crick & Dodge, 1994). Aggressive youths view their aggressive responses as necessary defenses to the perceived threat in their environment. While the association between hostile attribution bias and aggressive behavior is well documented in the SIP literature, these aspects of SIP have not been closely explored in relation to bullying (Crick & Dodge, 1994). Yet, a study by Ziv et al. (2013) found that youth who bully hold a hostile attribution bias and expect others to behave in a hostile and aggressive manner (Ziv et al., 2013). This novel study examined SIP patterns of adolescent bullies and victims and consistently found that bullies held more negatively biased SIP including hostile attribution bias, holding a belief that others would behave in a hostile and aggressive manner. These students were also more likely to choose aggressive responses due to their overarching aim of acting aggressively (Ziv et al., 2013).

**Retaliatory beliefs.** Youth who engage in reactive aggression tend to believe that aggressive responses are the most effective way to respond to the aggressive cues they interpret from their environment; less is known about the role of proactive aggression. Often these cues are incorrectly interpreted and aggressive youths thus view a retaliatory response as more effective than a prosocial response (Perry, Perry, & Rasmussen, 1986). As such, they respond to peers with aggressive and impulsive reactions (Lösel, Bliesener, & Bender, 2007). Additionally, aggressive youth tend to lack the necessary social skills to generate a non-aggressive response to a perceived threat (Dodge et al., 1986). This is another aspect of the SIP model that is well understood in the context of reactive aggression, and less well understood in the context of bullying and proactive aggression. With that said, research has connected retaliatory beliefs with proactive aggression (Smithmyer et al., 2000). The thoughts and beliefs that underlie the aggressive retaliatory actions are theorized to be associated with hostile attribution biases and negatively biased SIP. Present SIP research leaves a gap in examining association with bullying and types of bullying behaviors.

## Current Study

The extant theoretical and empirical literature suggests that executive functions may be related to bullying though mechanisms such as planning, reasoning, and disinhibition (Diamond, 2013; Ellis et al., 2009). Additionally, SIP studies suggest that children with negatively biased processing are more likely to bully (Camodeca & Goossens, 2005). While many theories exist, empirical evidence remains limited, relies heavily on self-report data, and focuses on aggression in general. Additionally, studies that do consider EFs and SIP in the context of bullying have typically focused on other

age ranges (i.e., preschool), and failed to account for the uniqueness of EF development in middle school. Studies that explore executive functions and associations with indirect bullying are both limited and inconsistent (Granvald et al., 2016). The present study considered the cognitive processes of EF and SIP as they related to bullying, through the use of performance data, an approach seldom used in studies to date.

This study aimed to deepen current understanding of developmentally informed risk factors for the perpetration of direct and indirect bullying amongst middle school students. We examined the relationship of EF and SIP to direct and indirect forms of bullying, contributing to a gap in the extant literature. Few studies have considered both SIP and EFs as they relate to two distinct forms of bullying, direct and indirect. By looking at middle school students, we aimed to fill gaps in the literature as prior research has focused on other stages of development. Examining bullying behaviors in the middle school years is particularly important given the potential to alter long term negative outcomes. Importantly, this study controlled for gender, as males and females develop quite differently during adolescence, in terms of maturation rates and outcomes (Blakemore & Choudhury, 2006; Kolb & Whishaw, 2009) and engage in different rates of direct bullying. While no specific hypotheses were formed regarding race, it was included as a control variable.

Based on prior research and theory, the primary research aim was to explore how executive functioning (i.e., hyperactivity/impulsivity, inhibition, planning/problem solving) and social information processing (i.e., retaliatory beliefs, hostile attribution bias, emotion identification, theory of mind) were associated with direct and indirect bullying. Specifically, we hypothesized that poorer executive functions (i.e., planning and

inhibition) and more negatively biased social information processing would be associated with more direct bullying, controlling for gender and race. In addition, we also hypothesized that better executive functions (i.e., higher planning/reasoning) and more negatively biased social information processing would be associated with more indirect bullying, controlling for gender and race.

## Method

### Participants

Data came from 280 students in 20 public middle schools in Maryland, participating in a school based cognitive-behavioral intervention for students with aggressive behavior problems, called Coping Power- Early Adolescent. We analyzed baseline data that were collected from participants in both intervention and control groups from three cohorts of 7$^{th}$ grade students, prior to their receipt of any intervention programming activities; as such no intervention effects were presented or needed to be controlled for in these analyses. Approximately 55 % of the sample was male and 45 % of the sample was female. With regard to ethnicity, the breakdowns were as follows: 74% Black, 11% White, 7% Hispanic, and 9% other. See Table 1 for additional information on the sample.

### Procedure

The schools voluntarily participated in the study after being approached by district personnel. Following school recruitment, a notification was sent home with all students to inform parents of a screening procedure in which teachers would complete a rating scale on all students in the classroom. Parents who did not consent for their child to be screened for eligibility into the project returned the written parental consent form and

the child was excluded from the screening process. Following the this consent process, 6th grade teachers completed the 6-item *Teacher Report of Reactive and Proactive Behaviors* measure (Dodge & Coie, 1987), which included the following six items: (a) When this child has been teased or threatened he/she gets angry easily and strikes back; (b) This child claims other children are to blame in a fight and feels that they started the trouble; (c) When someone accidently hurts this child (such as bumping into him/her), he/she assumes that the peer meant to do it and then reacts with anger; (d) This child gets other kids to gang up on somebody that he/she doesn't like; (e) This child uses physical force (or threatens to use physical force) in order to dominate other kids; (f) This child threatens or bullies others in order to get his/her own way, on a five point Likert scale (Never True, Rarely True, Sometimes True, Usually True, Almost Always True). This screener of proactive and reactive aggression was used to identify the 25% most aggressive children across the participating schools. This data was collected in the spring of student's 6th grade year, in order to screen students for enrollment in the study which began in the 7th grade year; yet in the current study, we used baseline data to avoid the potential of intervention effects on outcomes of interest.

Research team members trained in human subject's protection then approached the legal guardians of the students who screened eligible for inclusion in the project to obtain signed informed consent for participation in the project. Initial contacts to obtain informed consent were made by telephone calls followed by home visits. Following school-level and parent-level of approval, data collection proceeded, which occurred largely in October of each year. Student data were collected by project staff members. As described in detail below, students were administered a computerized version of the

Tower of Hanoi Task, a computerized Faces Social-Emotions Task, four subtests from the Woodcock Johnson Tests of Achievement, the Behavior Assessment System for Children, School Climate Measures, Bullying Aggression and Retaliation, School Connectedness and Engagement, and the Outcome Expectation Questionnaire. All of the questionnaires were administered in a group format on a computer at the school in the form of a single online survey. The performance data collection for students was completed in whole-group settings with two trained research assistants. The data collection and administration procedures were the same for both control and intervention groups.

The project was funded by the U.S. Department of Education's Institute of Education Sciences and was approved by the Institutional Review Boards at both the University of Virginia and the Johns Hopkins University. We used de-identified data from this project for secondary data analysis in the current study.

**Measures**

**Demographic characteristics.** Students responded to a series of questions about their basic demographics, including school, age, gender, grade level, and race. Race demographic variables included Asian/Pacific Islander, Black/African American, White/Caucasian, Hispanic/Latino, Native American/American Indian, Native Hawaiian, or Other.

**Executive functioning measures.**

***Tower of Hanoi Task.*** The Tower of Hanoi task is a measure of executive functioning that was developed for use both clinically and for research (TOH; Simon, 1975) in both pediatric and adult populations (Guevara, Martínez, Aguirre, & González,

2012; Homack, Lee, & Riccio, 2007; Robinson & Brewer, 2016; Simon, 1975). TOH has been validated in diverse samples and in clinical populations with executive function concerns, such as attention deficit hyperactivity disorder (Sullivan, Riccio, Castillo, 2009). TOH purports to measure executive processes including working memory (Zook, Davalos, DeLosh, & Davis, 2004), cognitive inhibition and flexibility (Bull, Espy, & Senn, 2004; Welsh, Satterlee-Cartmell, & Stine, 1999), goal-focused strategic planning (Goel & Grafman, 1995), attentional control (Sullivan, Piccio, & Castillo, 2009), and complex reasoning (Kopecky, Chang, Klorman, Thatcher, & Borgstedt, 2005).

This task consisted of five discs of increasing size placed on three pegs. Users were asked to move the discs from one peg to another, guided by a visual model, until the pegs reached the specified configuration. On each item, the pegs starting points were in different locations, and each item became increasingly difficult. The difficulty of the trial was a function of the start and end configurations specified. The parameters were determined in advance so that the examiner knew the minimum number of moves possible. The goal of the TOH was to assemble to model in the fewest number of moves possible, which differed depending on the problem. Examinees followed the following rules while completing the task: (a) when not being moved, disks were required to remain on the pegs; (b) larger disks cannot be placed on top of smaller disks; and (c) only one disk may be moved at a time. Examinees were allowed three attempts to complete each puzzle (two if they were correct the first two times), and they move the disks until one of three things happens: the puzzle was correct, they committed a rule violation, or they maxed out the number of moves allowed but it is still incorrect. In the current study, we administered the TOH using a touch based Samsung Galaxy Tablet (Chua, 2012; Hong,

2011). In the tablet-version of the task, moves were completed by touching and dragging the chosen disk from peg to peg in order to replicate the visual model. The above noted three rules applied to the tablet version as well, and if any one of these rules was violated, the tablet administered version cleared and the task restarted.

There were two outcomes of interest in this version of the TOH task, total correct (i.e., total number of the problems answered correctly) and total errors (i.e., total number of rule violations). These outcomes were considered indicators for overall planning/complex reasoning and impulse inhibition. Higher scores on total correct indicated better executive functioning, while higher scores on total errors indicated worse executive functioning (i.e., impulsivity).

***Behavior Assessment System for Children-Second Edition*** (BASC-2; Reynolds & Kamphaus, 2004). We used data from the hyperactivity scale of the BASC-2 from the teacher report. The hyperactivity scale was related to tendencies for being overly active, rushing through activities, and acting without thinking (Reynolds & Kamphaus, 2004). These symptoms frequently co-occur with executive dysfunction. Items for the teacher scale included the following: (a) acts out of control; (b) acts without thinking; (c) calls out in class; (d) cannot wait to take turn; (e) disrupts other adolescent's activities; (f) disrupts the schoolwork of other children; (g) fiddles with things while at meals; (h) has poor self-control; (i) has poor self control; (j) has trouble staying seated; (k) interrupts others when speaking; (l) is overly active; (m) is unable to slow down; (n) seeks attention while doing school work (teacher 14 item $\alpha$=.75). Participants responded on a 4-point Likert scale from 0 (*Never*) to 3 (*Always*). Items were scaled such that higher scores

indicated higher levels of hyperactivity, meaning that a higher score was worse or less favorable.

**Social information processing measures.**

***Outcomes Expectation Questionnaire.*** Students responded to a series of 12 vignettes in which they imagined performing a behavior toward a specific classmate (e.g., Mike/Michelle is teasing you at school by calling you name. To make him/her stop, you call him/her names back. What do you think he/she will do next), and indicated to what extent they felt confident that a particular consequence would occur: *(a) very sure that the target will get a desirable outcome; (b) pretty sure that the target will get a desirable outcome, (c) pretty sure that the target will get an undesirable outcome, (d) very sure that the target will get an undesirable outcome* (Perry, Perry, & Rasmussen, 1986). This measure assessed hostile attribution bias and subscales included tangible rewards and aversive treatment (Perry et al., 1986; $M$ = 19.04, $SD$ = 7.45; 12 item $\alpha$=.833). Higher scores indicated that the child does not expect aggressive behavior to work, and thus is a prosocial or favorable response. In this case, higher scores were considered better, as they indicated more prosocial responses.

***The Social-Emotions Task.*** The Social-Emotions Task (SET) was a task-based test of social cognition and empathy (Schaefer, 2014). Though the SET task is recently developed, it has shown strong reliability and validity. Specifically, it has been found to be less biased with regard to age, gender, and race than report based measures of empathy and social understanding (Schaefer, 2014). The SET also has modest to moderate correlations with other measures of empathy that have been used in the literature (Schaefer, 2014). As such, the SET task provides a unique measurement of social

information processing, as it is a performance measure with good reliability and validity. Greater empathic capacity, a social cognitive skill, has been correlated with acting altruistically (Eisenberg & Fabes, 1990) and increased satisfaction in personal relationships (Cassidy, Werner, Rourke, Zubernis, & Balaraman, 2003). Weaker empathic capacity has been associated with increased risk for violence (Lauterbach & Hosser, 2007), juvenile delinquency (Robinson, Roberts, Strayer, & Koopman, 2007), and bullying (Stavrinides, Georgiou, & Theofanous, 2010). Most tests that measure empathy rely solely on self-report data (Schaefer, 2014). To address this weakness in the literature, the SET was designed to be a task-based measurement of empathy and social thought. The SET was designed for utilization across various populations in both clinical and research contexts (Schaefer, 2014).

The SET consisted of series of short video clips (two seconds) and still images across a series of 24 trials. After exposure to the image or video, participants were asked to identify the emotion expressed in the image. Emotions to choose included afraid, angry, and sad. Following the emotion identification, participants chose identified the likely cause of the emotion. SET was developed and tested in a research laboratory and through online data collection. Lower scores on the SET were negatively associated with antisocial behaviors and psychopathic traits; further, higher performance was positively associated with favorable social functioning (Schaefer, 2014). The SET has been found to be a more reliable metric of empathy and social cognition than self-reported empathy measures and a better predictor for antisocial behavior (Schaefer, 2014).

The outcome measure of interest from the SET task was the percentage of correct responses on the emotion identification items (i.e., what is the person feeling) and on the

theory of mind items (i.e., why might the person be feeling that way). The emotion identification was an indicator for emotional understanding, while the theory of mind items was an indicator of social perceptiveness. In the task, students viewed a series of faces expressing different emotions, and they were asked to identify the emotion category (i.e., afraid, angry, sad) and identify why the person might be feeling that way. The total correct score is then based on the number of correct emotion identifications. Items were coded such that a higher score indicated higher levels of correct responses on emotion identification and theory of mind questions. In the case of the SET task, higher scores were considered better, as they indicated higher percentage of emotion understanding and social perception. These items were chosen in order to provide the broadest scope possible of emotional understanding and social perception as it related to direct and indirect bullying in the context of SIP theory.

***Retaliatory beliefs.*** Students answered a series of questions about their beliefs regarding retaliatory behaviors, which yielded a retaliation mean. This was a modified version of the Normative Beliefs about Aggression Scale (Huesmann, Guerra, Miller, & Zelli, 1992). Items were rated on a four point Likert scale from 1 *(strongly agree)* to 4 *(strongly disagree)*. The following items were administered: (a) It is okay to hit someone if they hit me first; (b) I believe that revenge is a good thing; (c) If people do something to make me really mad, they deserve to be beaten-up; (d) It is okay to hit someone if they start a fight on my turf, like my school or neighborhood; (e) If someone bullies me, I bully back ($M$ = 12.17, $SD$ = .3.44; 5 item $\alpha$=.754). Items were averaged to create a scale such that a higher score indicated that students did not think they should use retaliation.

**Involvement in bullying.** Students were asked to evaluate their bullying behavior by answering the following question, In what way(s) have you bullied someone else during the past 30-days and the response options were as follows for direct bullying, with the option to select more than one: (a) calling them bad names; (b) threatening to hit or hurt them; (c) teasing, picking on, or making fun of them; (d) pushing or shoving them; (e) hitting, slapping, or kicking them; (f) making sexual comments or gestures, (g) making racial comments. For indirect bullying, the response options were as follows, with the option to select more than one: (a) emailing, e-messaging, texting, or posting something bad about them on the internet; (b) spreading rumors or lies about them; (c) ignoring them or leaving them out on purpose; (d) stealing their things. In answering this question, students were instructed to check all options that applied to their experience (Solberg & Olweus, 2003; Bevans, Bradshaw, & Waasdorp, 2013; Bradshaw et al., 2007). These items were used to create two dichotomous scales of direct bullying and indirect bullying.

**Overview of the Analyses**

All statistical analyses were performed in SPSS version 25. Specifically, we conducted a series of Binomial Logistic Regression Models to address our hypotheses regarding the extent to which performance and report variables from students and teachers were associated with direct and indirect bullying. Covariates were chosen based on hypotheses and constructs measured by the variables. Performance measures of executive functioning measures planning/reasoning and impulse inhibition. Report measures of executive functioning examined teacher reported hyperactivity. Performance measures of social information processing measured overall emotional understanding and

social perception. Report measures of social information processing examined hostile attribution bias and retaliatory beliefs. See Figure 1 for visual representation of variables in the models. Covariates were added to the model in a stepwise fashion, with consideration of significance and stability of the covariates at each step, to reach the final model included in this manuscript. For all of the regression models, the outcome variable was the dichotomized mode of bullying (i.e., direct and indirect) and the predictor variables were items from student and teacher reports and performance measure outcomes of interest. For all of the logistic regression analyses, we present the adjusted odds ratios (AOR; see Table 3). 283 students were successfully administered the TOH and SET task. Of these students, no data was missing for student report measures. Three teachers had missing data for which listwise deletion was used, resulting in a total sample of 280 students (Allison, 2001).

## Results

### Descriptive Analyses

Approximately 29% of students reported perpetration of direct bullying, while 13% of students reported perpetration of indirect bullying. We conducted Pearson correlations for all items which did not suggest concerns with multi-collinearity for the purposes of logistic regression (see Table 2). Results suggested that the number of rule violations on the tower task and the number of correct items on the tower task were correlated such that more correct items were associated with more rule violations, $r$=.35, $p \leq .01$, which suggests a trial-and-error learning style. Additionally, the percent of correct items on the theory of mind and emotional identification questions on the SET task were significantly positively correlated with one another, $r$=.44, $p \leq .01$. Finally, the number of

correct items on the tower task was significantly associated with higher percentage of correct theory of mind, $r$=.17, $p \leq$.01, and emotional identification items, $r$=.20, $p \leq$.01, on the SET task. Despite a fairly weak effect size, these correlations suggest that students who have stronger affect recognition and theory of mind possess stronger planning and reasoning skills. Histograms representing the distribution of responses on the novel performance measures are located in Appendix 1.

**Associations between SIP and EFs with Direct Bullying**

Logistic regression analyses yielded numerous significant and non-significant results. There was no significance in the association between direct bullying and retaliatory beliefs, hostile attribution bias, teacher rated hyperactivity/impulsivity, rule violations on the tower task, theory of mind questions on the SET task, or race. It was particularly surprising that no significant association was found between student self-reported retaliatory beliefs and hostile attribution bias and direct bullying. Surprisingly, a higher number of correct items on the tower task was associated with significantly increased odds of engaging in direct bullying (AOR = 1.16, $p \leq .01$). This was an unexpected finding, as it was predicted that poorer complex reasoning and planning would be associated with direct bullying. This finding suggests that students who use direct bullying may have well developed reasoning skills. This is consistent with prior work suggesting that bullies in fact possess good reasoning skills which actually facilitates their perpetration of bullying (Jenkins et al., 2018). Additionally, due to limitations of the current measures, executive functions that better predict bullying may not be accounted for. Specifically, our indicator of impulsivity may not be accurately capturing this routine which was predicted to be associated with bullying. Higher

percentage of correct items on emotional identification questions was associated with significantly decreased odds of engaging in direct bullying (AOR = 0.979, $p \leq .05$). Finally, males were at significantly decreased odds of engaging in direct bullying, as compared to females (AOR = 0.53, $p \leq .05$). Overall, both performance and self-report results have important implications in this relatively new line of inquiry.

**Associations between SIP and EFs with Indirect Bullying**

Logistic regression analyses with indirect bullying also yielded varying results. No significant associations were found between indirect bullying and hostile attribution bias, total correct on the tower task, total rule violations on the tower task, percentage current on theory of mind questions on the SET task, teacher reported hyperactivity, or demographics (i.e., male students, race). Students self-reported lack of retaliatory beliefs was associated with significantly decreased odds of indirect bullying odds (AOR = 0.462, $p = <.01$), suggesting students who were more prosocial were less likely to perpetrate indirect bullying. Additionally, higher scores on the emotion identification portion of the SET task was associated with significantly decreased odds of engaging in indirect bullying (AOR = .975, $p = <.05$). This finding suggests that students with stronger emotion understanding and social perception were less likely to engage in indirect bullying. Again, this performance measure adds a unique understanding of the social cognitive processes that occur amongst these youth.

## Discussion

The present study explored the extent to which performance measures and self and teacher report data were associated with youths' engagement in direct or indirect bullying. The overarching goal of the analyses was to identify patterns in executive

functioning and social information processing as it related to direct and indirect bullying. Based on prior research (e.g., Coolidge et al., 2004; Ellis et al., 2009; Seguin & Zelazo, 2005; Verlinden et al., 2014) we predicted that students who engaged in more direct bullying would have poorer executive functions, namely higher degrees of impulsivity and disinhibition and lower degrees of planning and reasoning and more negatively biased social information processing (i.e., less prosocial). We also predicted that students who engaged in more indirect bullying would have better developed executive functions, namely planning and complex reasoning, in addition to negatively biased social information processing.

With regard to our descriptive findings, we observed an inverse association between retaliation and teacher reported hyperactivity, wherein students who held less retaliatory beliefs (i.e., more prosocial attitudes) were less likely to be viewed as hyperactive or impulsive by themselves or by their teachers. Although the relationship found was somewhat weak, it suggests that students who are better able to regulate their impulses may be better equipped to handle social situations in a prosocial manner. Additionally, a positive correlation was found between the number of correct items on the tower task, and percent of questions answered correctly on the theory of mind and emotional identification portions of the SET task, which suggests that children with better planning and reasoning skills possess better emotion understanding and social perception. Although these associations were relatively weak in terms of effect size (i.e., emotion identification $r$=.20, $p \leq .01$; theory of mind $r$=.17, $p \leq .01$), they do provide some support for the association between SIP and executive functioning. Specifically, this finding suggests that students who possess strong reasoning skills can apply these skills in

complex social situations, including affect recognition and social perception. In the context of our findings, direct bullies possessed stronger reasoning than their non direct bully peers. This strength may allow these students to engage in bullying which they perceive to have maximal impact on their victims through planning their acts of proactive aggression. (Crick & Dodge, 1999; Verlinden et al., 2014). Student's affect recognition was associated with decreased odds of engaging in both forms of bullying, strongly suggesting that accurate recognition of emotions decreases odds of perpetrating bullying. Overall, performance measures suggest that executive functioning and social information processing are important social and cognitive skills that appear to be related to one another, consistent with previous research on these processes (Mullin & Hinshaw, 2007).

**Direct Bullying**

As expected, positively biased social information processing was associated with decreased odds of engaging in direct bullying. Specifically, students who correctly identified more emotions were less likely to perpetrate direct forms of bullying .This finding is unique in that in contributes to current limited understanding of the SIP model as it relates to bullying, while also supporting the limited prior research (Ziv et al., 2013). It suggests that SIP is related to bullying more specifically, over and above prior work linking it with aggression more generally (Price & Dodge, 1989; Salmivalli & Nieminen, 2002). Specifically, this finding suggests that the lack of distortion early in the SIP model (e.g., accurate encoding and interpretation of cues) is associated with a low likelihood of forming subsequent aggressive goals. This ability to currently take in information and apply that information to prosocial functioning, in turn, is associated with less bullying behaviors (Smithmyer et al., 2000). Implications of this finding suggest that it is

important to target underlying social and cognitive processes when addressing bullying behaviors. Interventions that consider addressing distortions in the SIP model, such as social skills training in basic affect recognition, could be helpful in reducing instances of bullying. Classroom based interventions that focus on social emotional learning, such as the Promoting Alternative Thinking Strategies Program could be considered to address deficits in social processing specifically (Bradshaw & Gabarino, 2004).

Contrary to our hypothesis, students with better planning and reasoning abilities saw a 16% increased odds of engaging in direct bullying. Although this finding was unexpected, it suggests that understanding executive functioning in relation to direct bullying is complex and this finding has multiple implications. Specifically, while these students may show strong planning skills compared to counterparts, increased impulsivity is expected around middle school from a neurodevelopmental standpoint (Anderson et al., 1996). It is possible that these student's impulsivity and disinhibition was not captured in the current measures. While our indicator of impulse inhibition did not yield significant results, a more robust measure of this routine may have yielded different results. As such, executive dysfunction may still be related to bullying. With that said, prior work has suggested that bullies, in fact, possess strong reasoning skills which facilitate more impactful bullying (Sutton et al., 1999). Likewise, our findings suggested that stronger reasoning and planning was associated with 16% increased odds of engaging in direct bullying. This adds to a growing body of research positing that a deficit model of social and cognitive skills does not best explain bullying behavior. Rather, these students may possess superior planning and reasoning compared to peers which allows them to successfully perpetrate an act of bullying, which often requires a

significant planning and reasoning component (Coolidge et al., 2004; Ellis et al., 2009). Consistent with prior work, this finding suggests that EFs do appear to play a role in bullying. More robust performance measures of impulsivity could be used in future research to determine the contribution of additional executive subroutines.

Finally, results indicated that male students were almost 50% less likely than females to perpetrate direct bullying. This finding stands in stark contrast to most prior work on direct bullying (Card et al., 2008; Jenkins et al., 2018). It is likely that this unexpected finding is a result of bias in our sample, as the current sample consisted of students pre-screened for aggressive behavior.

**Indirect Bullying**

Results and implications were more limited with indirect bullying. Results regarding hypothesis that students who engage in this behavior were more likely to have negatively biased social information processing were variable. Specifically, students who did not hold retaliatory beliefs (i.e., held more prosocial attitudes) saw significantly decreased odds of engaging in indirect bullying by 53%. The strong association of this finding implies that students who do not think aggressive behavior works in social situations would be less likely to engage in indirect bullying. In other words, students who held more prosocial views (e.g., do not have aggressive goals), are more likely to shy away from anti-social behavior such as bullying. Within the context of the SIP model, this finding is particularly applicable to steps 3 (clarification of goals), 4 (consideration of responses), and 5 (selection of responses; Crick & Dodge, 1994), as these student's negative attitudes towards bullying would lead to selection of prosocial actions. Students with better social perception saw modest decreased odds of engaging in

indirect bullying. This finding ran parallel with social perception and direct bullying, suggesting that accurate encoding and interpretation of emotions results in more prosocial behavior.

While hypotheses regarding increased planning and indirect bullying were not found, we see emerging evidence that there is a planning or reasoning component in direct bullying instances discussed above. Our hypothesis that impulsivity would be associated with direct bullying was not borne out in analyses. There are several explanations for this, such as limitations of the performance measure; namely the use of one performance measure to assess the complex neuropsychological process of executive functioning. Additionally, some theories posit that bullies, especially those who act proactively may have good planning skills and less impulsivity and disinhibition (Crick & Dodge, 1999; Sutton, Smith, & Swettenham, 1999;).

**Limitations and Future Directions**

Although the current study aimed to fill several gaps in the literature, there are important limitations to consider. First, the data used in the analyses are cross sectional. That is, data capture students at one point in time. We were not able to establish causation in the analyses given that changes were not being tracked over time. A causal relationship between EFs and negatively biased SIP with bullying cannot be established in this study, for example. Another weakness in this study is the use of only one performance measure of executive function. Findings may have been more robust with inclusion of more performance measures of executive function. For example, there are many executive functions that were not included in the analyses, due to the use of one EF measure. Additional measures could have provided more robust data, especially with regard to

impulsivity and inhibition. A specific inhibition task (e.g., D-KEFS Color Word Interference) would have been particularly helpful in further assessing this subroutine. However, inclusion of additional performance measures would have required significant resources due to administration procedures, especially given the lack of availability of electronic means of administration. Our use of the tablet based tower task allowed executive functioning measures to be collected in a feasible manner. Future researchers can build upon this work by including more of these measures to further contribute to this line of research.

While multi-level modeling was not used in this study, due to the nature of the intervention (e.g., students were not nested within classrooms), future research could utilize multi-level modeling to account for nesting within schools. The relatively small sample size of the study is also a potential limitation, and has implications for the generalizability of the study. Lastly, given that the sample consists of an at-risk group of youth pre-screened as aggressive by their teachers, the results may not be generalizable to other samples. Specifically, students included in the study were screened and the sample consisted of aggressive children, introducing possible bias into the sample, as rating were provided by teachers. While previous research suggest that teacher's ratings of aggressive behavior are sensitive and consistent with peer sociometric ratings (Henry, Miller-Johnson, Simon, & Schoeny, 2006), there are limitations to consider, including biases and classroom dynamics. Future research could consider a multi-informant approach for inclusion in aggressive samples. It is unlikely that our finding with regard to gender and direct bullying would be replicated in a non-aggressive sample. With regard to race, students were coded as black or non-black. Issues of power in the sample did not allow

for race variable to be coded for more in depth analysis. This is an important limitation of the study as we were not able to draw more specific conclusions around race.

Despite these and other potential limitations, these findings illustrate the potential utility of examining processes such as executive functioning and social information processing in relation to bullying during adolescence. Moreover, a significant strength of this study was use of a multi-method and multi-informant approach. These findings also have important implications for intervention and prevention. For example, teacher ratings of hyperactivity and impulsivity was correlated with overall worse SIP and EF. Consideration of related executive functions, such as inhibition could be included in bullying prevention programs, and could serve as predictors of intervention effects. Overall, the current study may inform future research, while also pointing to potential targets of EF and SIP through prevention and intervention efforts.

## Conclusions and Implications

There are a number of important implications of this study with relation to the current state of bullying research. To begin, the approach used in our analyses is novel and unique, in that it included performance measures, in addition to informant measures, to predict bullying behaviors. The use of performance measures allowed us to better understand the social and cognitive processes of youth, rather than rely on retrospective reporting. In fact, these performance measures yielded more significant findings overall, suggesting their utility in future studies. By understanding direct and indirect bullying through performance measures, we are provided with a much deeper understanding of this complex social phenomenon. Of note, strengths and weaknesses in executive functioning and social information processing may serve as predictor of intervention

effects. To date, very few studies have utilized this type of multi method, multi informant approach.

Key findings from performance measures suggested that students who engaged in more direct bullying had better complex reasoning and planning skills, suggesting that these students may in fact need these stronger skills to engage in planned acts of proactive aggression. Additionally, enhanced emotion understanding was associated with less bullying overall. As such, prevention and interventions that incorporate social emotional learning may target underlying processes that contribute to bullying behaviors. Our findings yielded important information about the underlying cognitive processes that contribute to bullying, providing additional evidence that this is a complex social phenomenon. While we did not examine intervention effects, late elementary school and early middle school provide a key window for intervention, as aggressive behavior during this time period is predictive of subsequent conduct concerns (Ttofi & Farrington, 2011; Lochman, 1992). Given the complex nature of bullying, results provide support for the Three-Tiered Framework of Positive Behavior Interventions and Supports (PBIS; e.g., Bradshaw et al., 2014; Olweus et al., 2007) which provides specific interventions to at risk youth (e.g., social skills training) along with schoolwide universal prevention. The three tiered PBIS approach would help with intervention of the underlying cognitive and social processes related to bullying.

References

Allison, P. D. (2001). *Missing data: Quantitative applications in the social sciences.* Thousand Oaks, CA: Sage Publications.

Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. *Child neuropsychology*, *8*(2), 71-82.

Anderson, P. J. (2008). Towards a developmental model of executive function. In V. Anderson, R. Jacobs, & P. J. Anderson (Eds.), *Executive functions and the frontal lobes: A lifespan perspective* (pp. 3–23). New York: Psychology Press.

Anderson, P., Anderson, V., & Lajoie, G. (1996). The tower of London test: Validation and standardization for pediatric populations. *The Clinical Neuropsychologist*, *10*(1), 54-65.

Archer, J. (2004). Sex differences in aggression in real world settings: A meta-analytic review. *Review of General Psychology, 8,* 291 – 322.

Barbas, H., & Zikopoulos, B. (2007). The prefrontal cortex and flexible behavior. *Neuroscientist*, *13*, 532–545.

Bevans, K. B., Bradshaw, C. P., & Waasdorp, T. E. (2013). Gender bias in the measurement of direct and indirect forms of peer victimization: An application of item response theory. *Aggressive Behavior, 39,* 370–380. DOI: 10.1002/ab.21486.

Bishop, D. V. M., Aamodt-Leeper, G., Creswell, C., McGurk, R., & Skuse, D. H. (2001). Individual differences in cognitive planning on the Tower of Hanoi task: Neuropsychological maturity or measurement error?. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *42*(4), 551-556.

Blakemore, S. J., & Choudhury, S. (2006). Development of the adolescent brain: implications for executive function and social cognition. *Journal of Child Psychology and Psychiatry*, *47*(3-4), 296-312.

Booth, K. V. P. (2016). Attention-deficit/hyperactivity disorder (ADHD) in children born preterm and with poor fetal growth. *NeoReviews*, *17*(4), e213-e219.

Bradshaw, C. P. (Ed.). (2017). *Handbook on bullying prevention: A life course perspective*. NASW Press: New York, NY.

Bradshaw, C. P., Sawyer, A., & O'Brennan, L. M. (2007). Bullying and peer victimization at school: Perceptual differences between students and school staff. *School Psychology Review, 36,* 361–382.

Bradshaw, C. P., & Garbarino, J. (2004). Social cognition as a mediator of the influence of family and community violence on adolescent development: Implications for intervention. *Annals of the New York Academy of Sciences*, *1036*(1), 85-105.

Bradshaw, C. P., Rodgers, C. R., Ghandour, L. A., & Garbarino, J. (2009). Social–cognitive mediators of the association between community violence exposure and aggressive behavior. *School Psychology Quarterly*, *24*(3), 199-210.

Brocki, K. C., & Bohlin, G. (2004). Executive functions in children aged 6 to 13: a dimensional and developmental study. *Developmental Neuropsychology, 26*, 571–593.

Bull, R., Espy, K. A., & Senn, T. E. (2004). A comparison of performance on the Towers of London and Hanoi in young children. *The Journal of Child Psychology and Psychiatry*, *45*(4), 743-754. doi: 10.1111/j.1469-7610.2004.00268.x

Camodeca, M., Goossens, F. A., Schuengel, C., & Terwogt, M. M. (2003). Links between social information processing in middle childhood and involvement in bullying. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *29*(2), 116-127.

Camodeca, M., & Goossens, F. A. (2005). Aggression, social cognitions, anger and sadness in bullies and victims. *Journal of Child Psychology and Psychiatry*, *46*(2), 186-197.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*(5), 1185-1229. doi:10.1111/j.1467-8624.2008.01184.x.

Carlson, S. M., & Wang, T. S. (2007). Inhibitory control and emotion regulation in preschool children. *Cognitive Development*, *22*(4), 489-510.

Cassidy, K. W., Werner, R. S., Rourke, M., Zubernis, L. S., & Balaraman, G. (2003). The Relationship Between Psychological Understanding and Positive Social Behaviors. *Social Development, 12*(2), 198-221.

Chua, Y. P. (2012). Effects of computer-based testing on test performance and testing motivation. *Computers in Human Behavior, 28*(5), 1580-1586. doi: 10.1016/j.chb.2012.03.020

Coolidge, F. L., DenBoer, J. W., & Segal, D. L. (2004). Personality and neuropsychological correlates of bullying behavior. *Personality and Individual differences*, *36*(7), 1559-1569.

Cook, C. R., Williams, K. R., Guerra, N. G., Kim, T. E., & Sadek, S. (2010). Predictors of bullying and victimization in childhood and adolescence: a meta-analytic investigation. *School psychology quarterly*, *25*(2), 65.

Crick, N., & Dodge, K. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*(1), 74-101. doi:10.1037/0033-2909.115.1.74.

Crick, N. R., Grotpeter, J. K., & Bigbee, M. A. (2002). Relationally and physically aggressive children's intent attributions and feelings of distress for relational and instrumental peer provocations. *Child Development*, *73*(4), 1134-1142.

Diamond, A. (2013). Executive functions. *Annual review of psychology*, *64*, 135-168.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, *53*(6), 1146.

Dodge, K. A., & Crick, N. R. (1990). Social information-processing bases of aggressive behavior in children. *Personality and Social Psychology Bulletin*, *16*(1), 8-22.

Dodge, K. A., Pettit, G. S., McClaskey, C. L., & Brown, M. M. (1986). Social competence in children, Monographs of the Society of Research. *Child Development*, *51*(2).

Eisenberg, N., & Fabes, R. A. (1990). Empathy: Conceptualization, measurement, and relation to prosocial behavior. *Motivation and Emotion*, *14(2)*, 131-149.

Ellis, M. L., Weiss, B., & Lochman, J. E. (2009). Executive functions in children: Associations with aggressive behavior and appraisal processing. *Journal of Abnormal Child Psychology*, *37*(7), 945-956.

Giancola, P. R. (1995). Evidence for dorsolateral and orbital prefrontal cortical involvement in the expression of aggressive behavior. *Aggressive Behavior, 21*(6), 431-450.

Gladden, R. M., Vivolo-Kantor, A. M., Hamburger, M. E., & Lumpkin, C. D. (2014). *Bullying surveillance among youths: Uniform definitions for public health and recommended data elements, Version 1.0*. Atlanta, GA: Centers for Disease Control and Prevention.

Goel, V., & Grafman, J. (1995). Are the frontal lobes implicated in "planning" functions? Interpreting data from the Tower of Hanoi. *Neuropsychologia, 33*(5), 623-642. doi: 10.1016/0028-3932(95)90866-P

Granvald, V., & Marciszko, C. (2016). Relations between key executive functions and aggression in childhood. *Child Neuropsychology, 22*(5), 537-555.

Grigsby, J., & Stevens, D. (2000). *Neurodynamics of Personality*. Guilford Press.

Guevara, M. A., Martínez, L. E. R., Aguirre, F. A. R., & Hernández-González, M. (2012). Prefrontal-parietal correlation during performance of the Towers of Hanoi task in male children, adolescents, and young adults. *Developmental Cognitive Neuroscience, 2*, 129-138. doi:10.1016/j.dcn.2011.05.002

Henry, D. B., Miller-Johnson, S., Simon, T. R., & Schoeny, M. E. (2006). Validity of teacher ratings in selecting influential aggressive adolescents for a targeted preventive intervention. *Prevention Science, 7*(1), 31-41.

Homack, S., Lee, D., & Riccio, C. A. (2007). Test review: Delis-Kaplan Executive Function System. *Journal of Clinical and Experimental Neuropsychology, 27*(5), 599-609. doi: 10.1080/13803390490918444.

Hong, J. (2011). Tower of Hanoi -Pro. Retrieved from https://itunes.apple.com/us/app/tower-of-hanoi-pro/id432096485?mt¼8.

Hudspeth, W. J., & Pribram, K. H. (1990). Stages of brain and cognitive maturation. *Journal of Educational Psychology, 82*(4), 881-884.

Huesmann, R., Guerra, N., Miller, L., & Zelli, A. (1992). The role of social norms in the development of aggression. In H. Zumkley & A. Fraczek (Eds.), *Socialization and Aggression* (pp. 139–151). New York: Springer.

Hughes, C., White, A., Sharpen, J., & Dunn, J. (2000). Antisocial, angry, and unsympathetic:"Hard-to-manage" preschoolers' peer problems and possible cognitive influences. *The Journal of Child Psychology and Psychiatry and Allied Disciplines, 41*(2), 169-179.

Jenkins, L. N., Tennant, J. E., & Demaray, M. K. (2018). Executive functioning and bullying participant roles: Differences for boys and girls. *Journal of School Violence, 17*(4), 521-537.

Kail, R. (1986). The impact of extended practice on rate of mental rotation. *Journal of Experimental Child Psychology, 42*(3), 378-391.

Kempes, M., Matthys, W., De Vries, H., & Van Engeland, H. (2005). Reactive and proactive aggression in children: A review of theory, findings and the relevance for child and adolescent psychiatry. *European Child & Adolescent Psychiatry, 14*(1), 11-19.

Kljakovic, M., & Hunt, C. (2016). A meta-analysis of predictors of bullying and victimization in adolescence. *Journal of Adolescence*, *49*, 134-145.

Kolb, B., & Whishaw, I. Q. (2009). *Fundamentals of Human Neuropsychology*. Macmillan.

Kopecky, H., Chang, H. T., Klorman, R., Thatcher, J. E., & Borgstedt, A. D. (2005). Performance and private speech of children with attention-deficit/ hyperactivity disorder while taking the Tower of Hanoi test: Effects of depth of search, diagnostic subtype, and methylphenidate. *Journal of Abnormal Child Psychology, 33*(5), 625-638. doi: 10.1007/s10802-005-6742-7.

Kowalski, R. M., Limber, S. P., Limber, S., & Agatston, P. W. (2012). *Cyberbullying: Bullying in the digital age*. John Wiley & Sons.

Laursen, B., & Williams, V. A. (1997). Perceptions of interdependence and closeness in family and peer relationships among adolescents with and without romantic partners. *New Directions for Child and Adolescent Development*, *1997*(78), 3-20.

Lauterbach, O., & Hosser, D. (2007). Assessing empathy in prisoners--A shortened version of the Interpersonal Reactivity Index. *Swiss Journal of Psychology*, *66*(2), 91-101.

Lezak, M. D., Howieson, D. B., Bigler, E. D., & Tranel, D. (2012). Neuropsychological Assessment: OUP USA.

Lochman, J. E. (1992). Cognitive-behavioral intervention with aggressive boys: three-year follow-up and preventive effects. *Journal of Consulting and Clinical psychology*, *60*(3), 426-432.

Lochman, J. E., & Wells, K. C. (2002). Contextual social–cognitive mediators and child outcome: A test of the theoretical model in the Coping Power program. *Development and Psychopathology*, *14*(4), 945-967.

Lösel, F., Bliesener, T., & Bender, D. (2007). Social information processing, experiences of aggression in social contexts, and aggressive behavior in adolescents. *Criminal Justice and Behavior*, *34*(3), 330-280.

Maccoby, E. E., & Jacklin, C. N. (1978). *The psychology of sex differences* (Vol. 2). Stanford University Press.

Meece, D., & Laird, R. D. (2006). The importance of peers. In F. A. Villarruel & T. Luster (Eds.), *The crisis in youth mental health: Critical issues and effective programs, vol. 2: Disorders in adolescence.* (pp. 283-311). Westport, CT, US: Praeger Publishers/Greenwood Publishing Group.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*, *41*(1), 49-100.

Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions four general conclusions. *Current Directions in Psychological Science*, *21*, 8–14.

Monks, C. P., Smith, P. K., & Swettenham, J. (2005). Psychological correlates of peer victimisation in preschool: Social cognitive skills, executive function and attachment profiles. *Aggressive Behavior, 31*(6), 571-588.

Mullin, B. C., & Hinshaw, S. P. (2007). Emotion Regulation and Externalizing Disorders in Children and Adolescents. In J. J. Gross (Ed.), *Handbook of Emotion Regulation* (pp. 523-541). New York: Guilford Press.

Goldstein, S., & Naglieri, J. A. (2013). Autism Spectrum Rating Scales: ASRS. MHS.

National Academies of Sciences, Engineering, and Medicine. (2016). *Preventing bullying through science, policy, and practice*. Washington, DC: National Academies of Sciences, Engineering, and Medicine.

Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Malden: Blackwell Publishing.

Olweus, D., Limber, S. P., Flerx, V. C., Mullin, N., Riese, J., & Snyder, M. (2007). *Olweus Bullying Prevention Program: Schoolwide guide*. Center City, MN: Hazelden.

O'Toole, S. E., Monks, C. P., & Tsermentseli, S. (2017). Executive function and theory of mind as predictors of aggressive and prosocial behavior and peer acceptance in early childhood. *Social Development*, *26*(4), 907-920.

Perry, D. G., Perry, L. C., & Rasmussen, P. (1986). Cognitive social learning mediators of aggression. *Child Development*, 700-711.

Perry, B. D. (2002). Childhood experience and the expression of genetic potential: What childhood neglect tells us about nature and nurture. *Brain and mind*, *3*(1), 79-100.

Reynolds, C. R. (2004). *Behavior assessment system for children*. John Wiley & Sons, Inc.

Robinson, S. J., & Brewer, G. (2016). Performance on the traditional and the touch screen, tablet versions of the Corsi Block and Tower of Hanoi tasks. *Computers in Human Behavior, 60*, 29-34. doi: 10.1016/j.chb.2016.02.047.

Robinson, R., Roberts, W. L., Strayer, J., & Koopman, R. (2007). Empathy and emotional responsiveness in delinquent and non-delinquent adolescents. *Social Development,* 16(3), 555-579.

Salmivalli, C., & Nieminen, E. (2002). Proactive and reactive aggression among school bullies, victims, and bully-victims. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, *28*(1), 30-44.

Savin-Williams, R. C., & Berndt, T. J. (1990). Friendship and peer relations. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 277-307). Cambridge, MA: Harvard University Press.

Schaefer, H. S. (2014). *Empathy assessment and the prediction of social behavior: development and validation of the Social-Emotions Task (SET) for the measurement of empathy and theory of mind* (Doctoral dissertation). University of Virginia, Virginia.

Séguin, J. R., & Zelazo, P. D. (2005). Executive function in early physical aggression. *Developmental Origins of Aggression*, 307-329.

Simon, H. A. (1975). The functional equivalence of problem-solving skills. *Cognitive Psychology, 7*(2), 268–288. doi: 10.1016/0010-0285(75)90012-2.

Smithmyer, C. M., Hubbard, J. A., & Simons, R. F. (2000). Proactive and reactive aggression in delinquent adolescents: Relations to aggression outcome expectancies. *Journal of Clinical Child Psychology*, *29*(1), 86-93.

Solberg, M., & Olweus, D. (2003). Prevalence estimation of school bullying with the Olweus Bully/Victim Questionnaire. *Aggressive Behavior, 29*(3), 239–268.

Stavrinides, P., Georgiou, S., & Theofanous, V. (2010). Bullying and empathy: A short-term longitudinal investigation. *Educational Psychology*, 30(7), 793-802.

Stuss, D. T., & Alexander, M. P. (2000). Executive functions and the frontal lobes: a conceptual view. *Psychological Research, 63*(3), 289-298.

Sullivan, J. R., Riccio, C. A., & Castillo, C. L. (2009). Concurrent validity of the tower tasks as measures of executive function in adults: A meta-analysis. *Applied Neuropsychology, 16*(1), 62-75. doi: 10.1080/09084280802644243.

Sutton, J., Smith, P. K., & Swettenham, J. (1999). Bullying and 'theory of mind': A critique of the 'social skills deficit' view of anti-social behaviour. *Social Development, 8*(7), 117-127.

Tamnes, C. K., Østby, Y., Fjell, A. M., Westlye, L. T., Due-Tønnessen, P., & Walhovd, K. B. (2009). Brain maturation in adolescence and young adulthood: regional age-related changes in cortical thickness and white matter volume and microstructure. *Cerebral cortex, 20*(3), 534-548.

Toblin, R. L., Schwartz, D., Gorman, A. H., & Abou-ezzeddine, T. (2005). Social–cognitive and behavioral attributes of aggressive victims of bullying. *Journal of Applied Developmental Psychology*, *26*(3), 329-346.

Tremblay, R. E., Nagin, D. S., Séguin, J. R., Zoccolillo, M., Zelazo, P. D., Boivin, M., ... & Japel, C. (2004). Physical aggression during early childhood: Trajectories and predictors. *Pediatrics*, *114*(1), e43-e50.

Ttofi, M. M., & Farrington, D. P. (2011). Effectiveness of school-based programs to reduce bullying: A systematic and meta-analytic review. *Journal of Experimental Criminology*, *7*(1), 27-56.

Verlinden, M., Veenstra, R., Ghassabian, A., Jansen, P. W., Hofman, A., Jaddoe, V. W., ... & Tiemeier, H. (2014). Executive functioning and non-verbal intelligence as predictors of bullying in early elementary school. *Journal of Abnormal Child Psychology*, *42*(6), 953-966.

Wang, J., Iannotti, R. J., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent health*, *45*(4), 368-375.

Welsh, M. C., Pennington, B. F., & Groisser, D. B. (1991). A normative-developmental study of executive function: A window on prefrontal function in children. *Developmental Neuropsychology*, *7*(2), 131-149.

Welsh, M. C., Satterlee-Cartmell, T., & Stine, M. (1999). Towers of Hanoi and London: Contribution of working memory and inhibition to performance. *Brain and Cognition, 41*(2), 231-242. doi: 10.1006/brcg.1999.1123.

Zelazo, P. D., Carter, A., Reznick, J. S., & Frye, D. (1997). Early development of executive function: A problem-solving framework. *Review of General Psychology*, *1*(2), 198-226.

Ziv, Y., Hadad, B. S., Khateeb, Y., & Terkel-Dawer, R. (2014). Social information processing in preschool children diagnosed with autism spectrum disorder. *Journal Autism Developmental Disorders, 44,* 846–859.

Ziv, Y., Leibovich, I., & Shechtman, Z. (2013). Bullying and victimization in early adolescence: Relations to social information processing patterns. *Aggressive Behavior*, *39*(6), 482-492.

Ziv, Y., & Sorongon, A. (2011). Social information processing in preschool children: Relations to sociodemographic risk and problem behavior. *Journal of Experimental Child Psychology, 3*, 412–429.

Zook, N. A., Davalos, D. B., DeLosh, E. L., & Davis, H. P. (2004). Working memory, inhibition, and fluid intelligence as predictors of performance on Tower of Hanoi and London tasks. *Brain and Cognition, 56*(3), 286-292. doi:10.1016/j.bandc.2004.07.003

Figure 1
*Visual Representation of Variables in the Models*

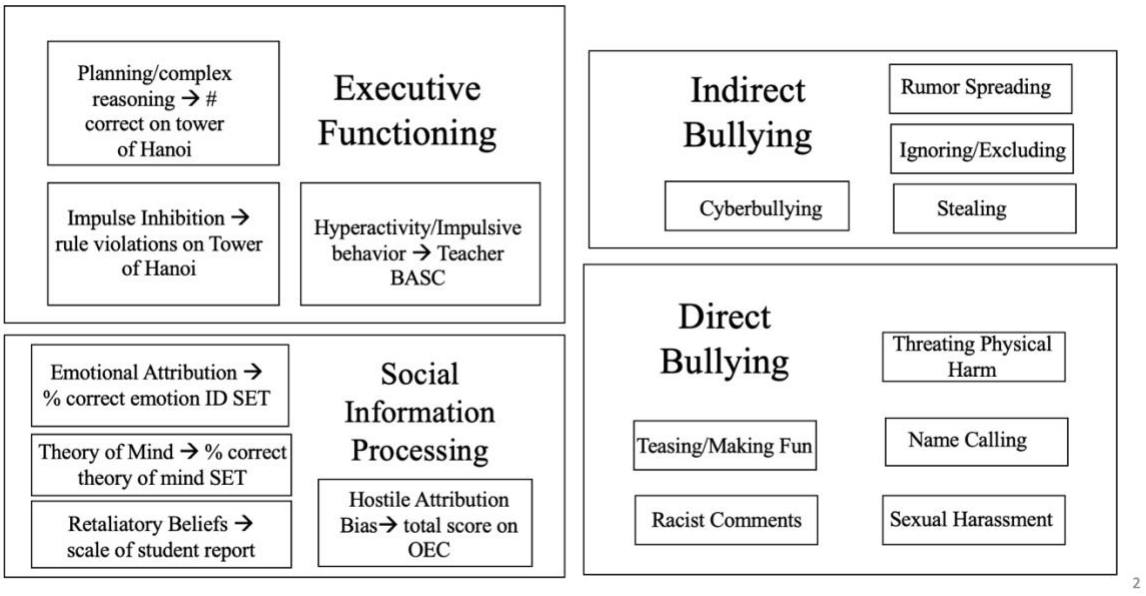


Table 1
*Student Characteristics (N=280)*

| Sex | N (%) |
|---|---|
| Female | 123 (44.6%) |
| Male | 155 (55.4%) |
| Race/ ethnicity | |
| White | 30 (10.7%) |
| Hispanic | 19 (6.8%) |
| Black | 206 (73.6%) |
| Other | 25 (8.9%) |

Table 2

*Pearson Correlation Coefficients Matrix for Logistic Regression Predictor and Control Variables (N=280)*

| | Hostile Attribution Bias | Retaliation | Teacher Hyperactivity | % TOM | % EID | # Correct Tower | # Rule Violations |
|---|---|---|---|---|---|---|---|
| Hostile Attribution Bias | M=1.60, (SD= 0.61) | | | | | | |
| Retaliation | .131* | M=2.42, SD= 0.69 | | | | | |
| Teacher Hyperactivity | .014 | -.138* | M=58.20, SD=11.55 | | | | |
| % TOM | .231** | .087 | -.044 | M=60.45, SD=12.96 | | | |
| % EID | .074 | -.009 | -.085 | .441** | M=58.89, SD=16.22 | | |
| # Correct Tower | .067 | .026 | -.082 | .173** | .201** | M=5.07, SD=2.8 | |
| # Rule Violations | .015 | -.026 | -.002 | .103 | .031 | .355** | M=7.02, SD=2.6 |

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

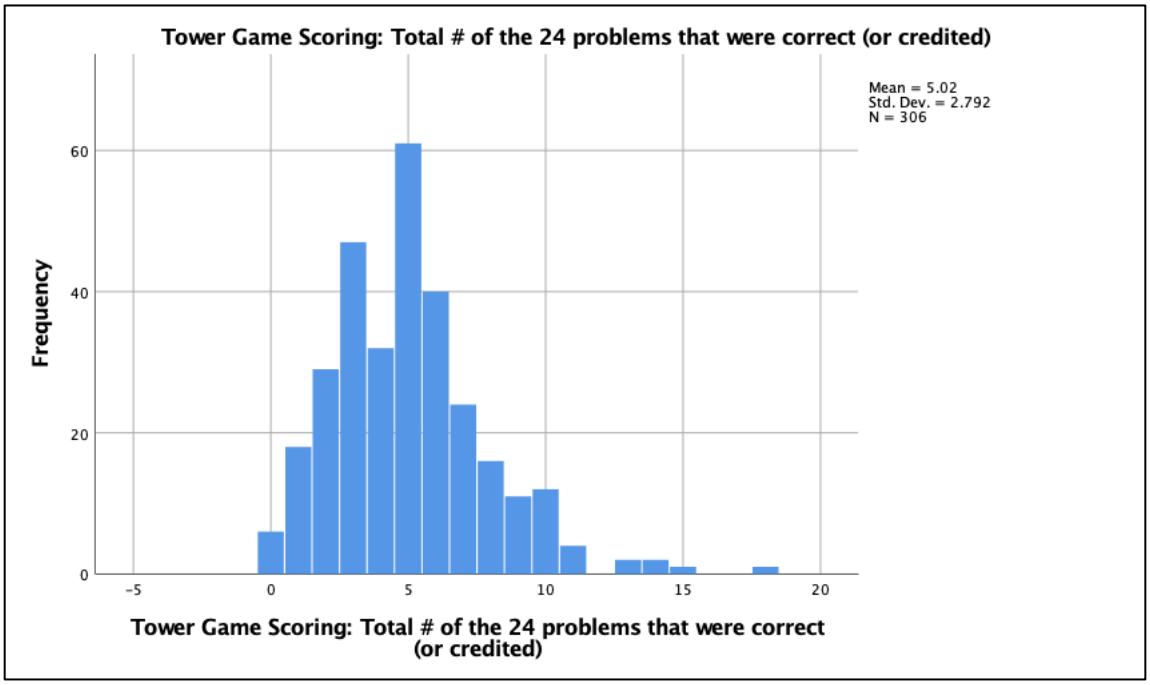
Table 3
*Combined Logistic Regression Results Examining Direct and Indirect Bullying (N=280)*

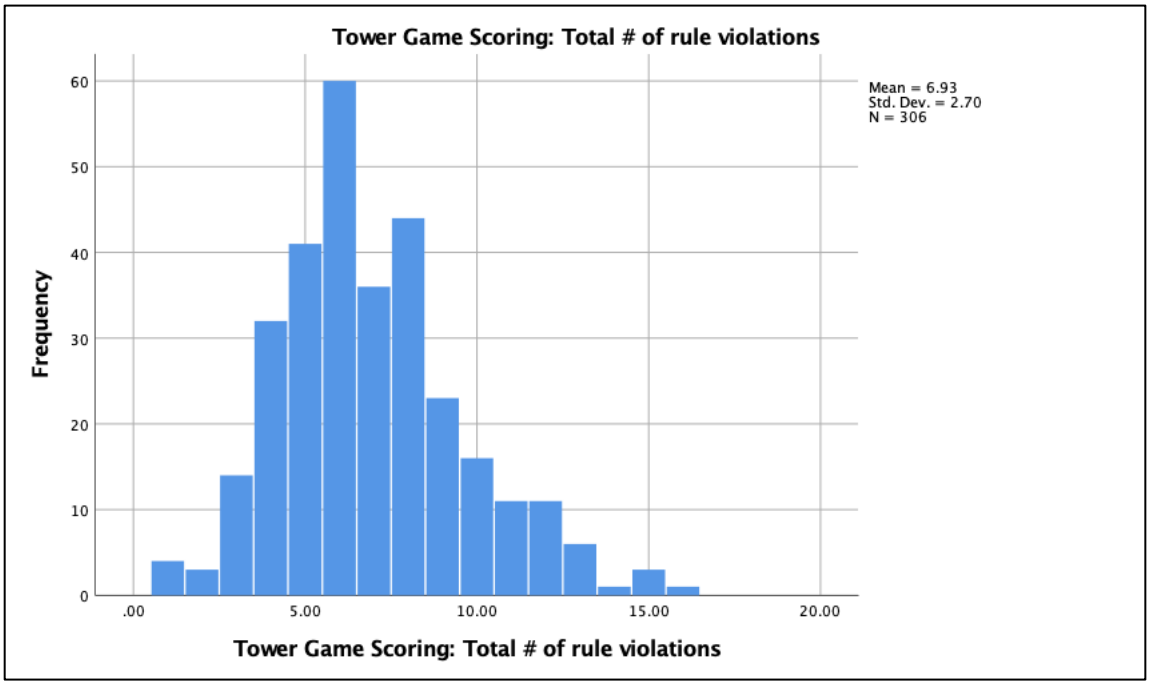
| | Direct AOR [95% CI] | Indirect AOR [95% CI] |
|---|---|---|
| **Student Report** | | |
| Retaliation | 0.81 [CI=.54-1.21] | .462** [CI=.27-.80] |
| Hostile Attribution Bias | 0.91 [CI=.57-1.44] | 1.13 [CI=.61-2.07] |
| **Performance Measures** | | |
| Tower: Total Correct | 1.16** [1.04-1.29] | 1.03 [.90-1.18] |
| Tower: Rule Violations | 0.94 [.84-1.05] | 1.00 [.87-1.15] |
| Faces: % correct EID | 0.979* [.96-1.0] | 0.975* [.95-.99] |
| Faces: % correct TOM | 1.01 [.99-1.04] | 1.01 [.97-1.04] |
| Teacher Hyperactivity | 1.01 [1.0-1.04] | 0.99 [.96-1.02] |
| Demographic Predictors | | |
| African-American | 1.14 [.61-2.13] | 0.72 [.33-1.58] |
| Male | 0.53* [.31-.92] | 0.87 [.42-1.81] |

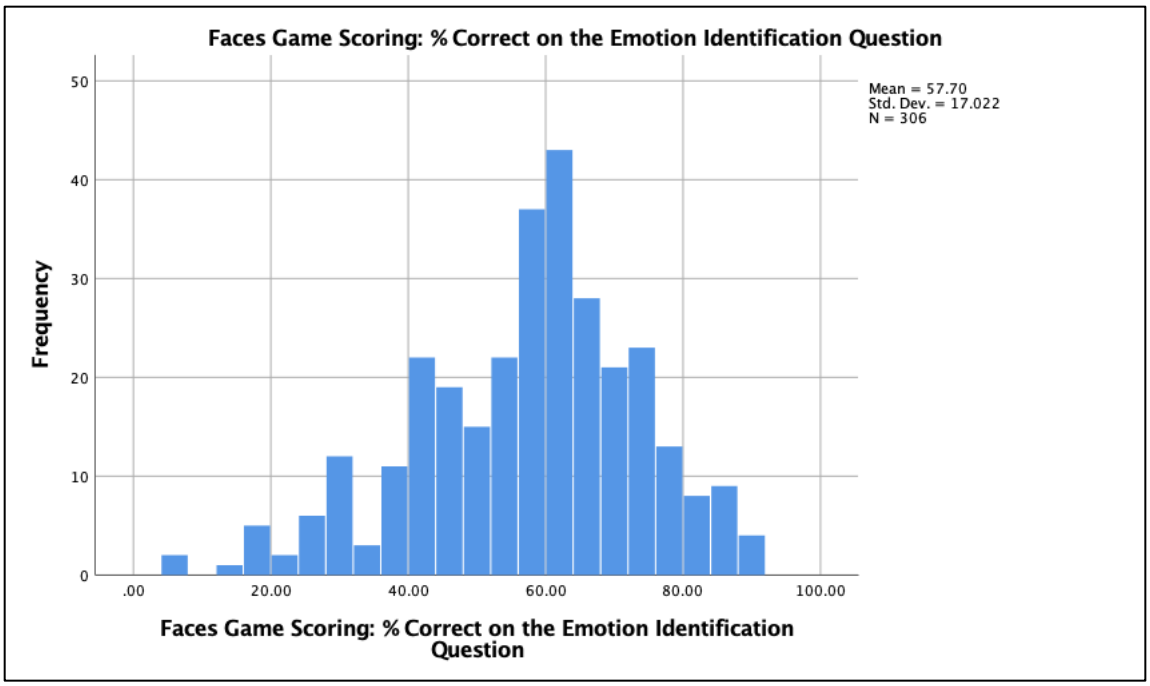
* $p < .05$, ** $p \leq .01$, AOR = adjusted odds ratio, 95% Confidence intervals (CI) in brackets

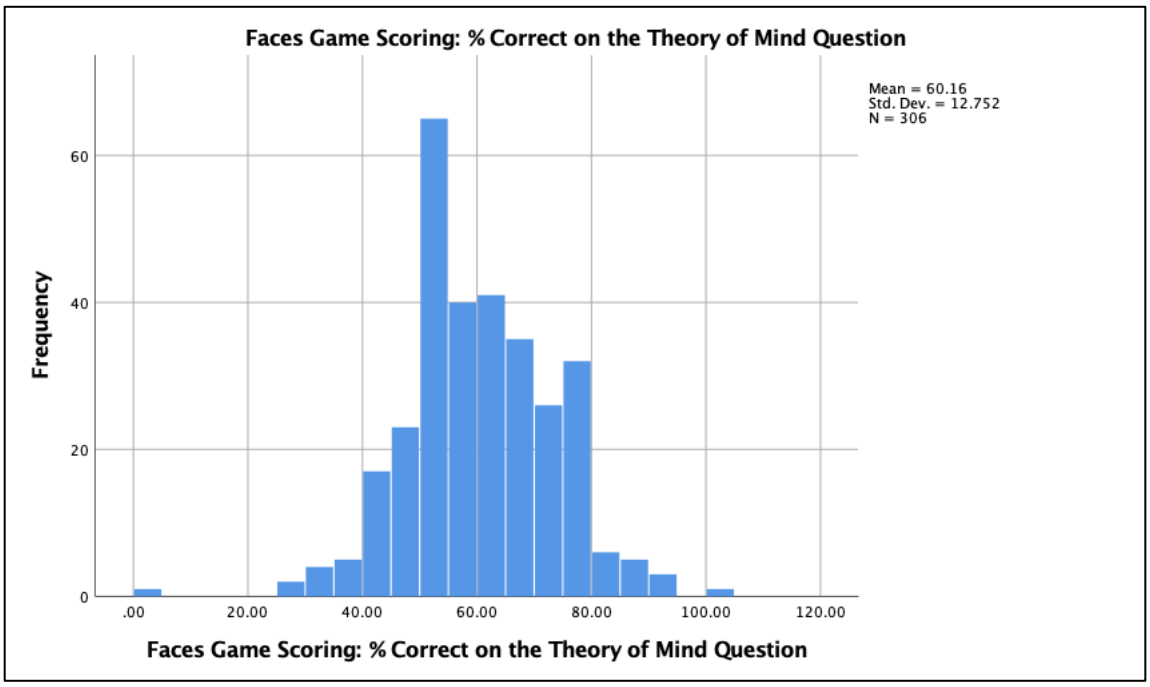
Appendix 1:

*Distribution of Performance Items for Executive Functioning and Social Information Processing*




Faces Game Scoring: % Correct on the Emotion Identification Question
Mean = 57.70
Std. Dev. = 17.022
N = 306
Frequency
50
40
30
20
10
0
.00
20.00
40.00
60.00
80.00
100.00
Faces Game Scoring: % Correct on the Emotion Identification Question


Faces Game Scoring: % Correct on the Theory of Mind Question
Mean = 60.16
Std. Dev. = 12.752
N = 306
Frequency
60
40
20
0
.00
20.00
40.00
60.00
80.00
100.00
120.00
Faces Game Scoring: % Correct on the Theory of Mind Question