Context-Specific Aggression: Prevalence and Outcomes of Aggression in the Home and at School in Childhood and Early Adolescence

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
In partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
April 30, 2021

Keywords: aggression, school, home,
childhood, adolescence, informant

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Abstract

Consistently elevated levels of aggression in childhood are problematic; however, the unique effects of aggression that occurs primarily at home or at school (i.e., context-specific aggression) are not well understood. The following three aims were examined in this prospective, longitudinal, multi-informant study: 1) to assess the prevalence of context-specific aggression in childhood 2) to examine the extent to which child aggression in one context (e.g., home) predicts early adolescent aggression in the other context (e.g., school), and 3) to test the unique effects of aggression at home and school and outcomes of context-specific aggression in childhood and early adolescence.

Aggression at home was assessed via mother and father reports in kindergarten through second grade, and mother reports from sixth through eighth grade. Aggression at school was assessed with teacher and peer reports from kindergarten through second grade, and via teacher reports from sixth through eighth grade. Outcomes of interest included records of academic achievement in third and ninth grade, self-reported peer adjustment in third grade, and self-reported internalizing and peer adjustment in ninth grade.

Correlation and latent profile analyses were used to detect convergence across contexts as well as proportions of participants who displayed cross-context and context-specific aggression. Cross-lagged panel analysis with latent aggression variables were used to examine within- and cross-context prediction from childhood to early adolescence. Polynomial regression with response surface analysis was used to assess outcomes of aggression that occurred primarily at home or at school during childhood.

Results revealed that aggressive behavior is moderately correlated across home and school contexts and that aggressive behavior commonly occurs primarily at home or at school, though the largest proportion of children displayed low levels of aggression across both contexts. Aggressive behavior was highly stable within each context, but aggression at home during childhood did not predict higher aggression at school during early adolescence, nor did aggression at school during childhood predict higher aggression at home during early adolescence.

Of particular interest were the unique effects of aggression at home and at school. A discrepancy effect for academic achievement in third grade emerged, with a sharper decline in academic achievement apparent as levels of aggression at home and school grew increasingly discrepant from each other. Home-based aggression in childhood predicted poorer self-reported peer adjustment in early adolescence. Evidence for the association between home-based aggression in childhood and internalizing problems in early adolescence was mixed: Home-based aggression predicted internalizing problems in response surface analyses with factor scores, but not in analyses with latent variables. The present study provides evidence that aggressive behavior during childhood in only one setting is relatively common and may be worthy of intervention to disrupt longer term negative developmental outcomes.

Acknowledgements

I would like to express my sincerest gratitude to my advisor, Dr. Stephen Erath for not only his expertise and mentorship throughout the years, but also for his kindness, patience, and understanding as we worked together to achieve my goals. There was not a moment that I did not feel completely supported by him, and I truly appreciate his guidance on this project. I wish to thank my mentor, Dr. Gregory Pettit, for his unending support over the last decade. He has become a close friend and trusted advisor on all things professional and otherwise. I am thankful for his work with the Child Development Project, as well as the opportunity to work with such a rich data set. I would also like to thank my committee members, Dr. Wendy Troop-Gordon and Dr. Ben Hinnant for their expertise and support along the way.

I want to express deep appreciation for my parents, James and Lori Arends, who continuously told me I was capable of big things, even when I least believed it. They have always been on the proverbial front row, cheering me on. I want to thank my husband, Jaben, for his support along the way, and for being patient when three years turned into six. Thank you for coming on this journey alongside me, and for believing that this was a worthwhile investment for me and for our family.

I have to thank my beautiful children, all five of them – Grayson, Levi, Holden, Lennox, and Reagan. I love nothing in my life more than you, kiddos, and I am grateful for your support and love. I won't even take it personally that you're unimpressed I have been in school for nearly 30 years. I hope that if anything, I am encouragement that you can do literally anything that you set your mind to.

To my friends - I want to express gratitude for sticking with me through thick and thin. My graduate school friends who have provided support and encouragement as well as answered endless questions about statistics, thank you! My friends from college and the neighborhood, I love you so much. Thank you for keeping me sane and grounded every step of the way.

Finally, I have to thank myself – for getting up in the morning and staying up late to finish the thing. We did it.

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I. INTRODUCTION

Aggression refers to a range of interpersonally oppositional and harmful behaviors as well as disruptive behaviors and destruction of objects or property (Achenbach, 1991; Dodge et al., 2006). While some level of aggression is normative, most children develop more prosocial behaviors and the self-regulation required for non-aggressive responses to conflict and frustration around the time they enter elementary school (Broidy et al., 2003; Hay et al., 2004; Tremblay, 2000). Paralleling further cognitive development and accumulated social experiences, aggression typically continues to decline from childhood through adolescence (Stanger et al., 1997). Consistently elevated aggressive behavior, however, contributes to concurrent and long-term developmental difficulties. More specifically, aggression in childhood has been associated with problematic peer experiences including peer rejection (Campbell et al., 2006; Dodge et al., 2006), as well as academic outcomes such as lower grades and standardized test scores (Campbell et al., 2010). In early adolescence, aggression has been linked to increased depression (Cleverley et al., 2012), lower academic achievement (Campbell et al., 2010), crime involvement (e.g., Odgers et al., 2008), and substance abuse (e.g., Fergusson & Horwood, 1995; Huesmann et al., 2009).

The negative outcomes of aggressive behavior are numerous and long-lasting in part because aggression is relatively stable across time and settings (Huesmann et al., 2009; Olweus, 1979; Piquero et al., 2012). As such, researchers often rely on either parent or teacher reports of childhood aggression or combine reports from multiple informants. However, children's behavior can vary across settings, with problems presenting in one context that are not apparent in another context. In fact, research has

established that concordance across reporters in different settings (e.g., parents and teachers) is only modest to moderate, even for relatively stable and easily observed behaviors such as aggression (e.g., Achenbach, 2011; Achenbach et al., 1987). Outcomes of aggressive behavior may vary based on the context in which aggression occurs because different developmental tasks are typically accomplished in different settings, at different times.

Children's aggressive behavior at home may impede the pursuit of largely home-based developmental tasks and interfere with parental socialization efforts (Dodge et al., 1994). For example, aggression in the home often leads to more punitive and inconsistent parenting behaviors and less parental warmth and acceptance, all of which are linked to negative outcomes such as increased internalizing and externalizing problems (e.g., de Haan et al., 2013; Martin, 1975; Wahler & Dumas, 1986). On the other hand, children's aggressive behavior at school may undermine pursuit of a different set of school-based developmental tasks and thereby compromise long-term adjustment. For instance, children who exhibit aggressive behaviors in the school setting often experience peer rejection and deviant peer affiliations, poorer teacher-child relationships, and disruptions in instructional time, leading to poorer grades and school disliking (e.g., Bierman et al., 2013; Birch & Ladd, 1998; Lansford et al., 2010; Nurmi, 2012).

Although some studies consider the existence and predictors of single- and cross-context aggression, few studies have examined the unique effects of aggression at home and school. Often these studies include clinical samples, which may exclude children with problematic but not clinically significant aggression. In addition, clinical studies often include children receiving mental health services, which may exclude children with

context-specific aggression, for whom treatment may be considered unwarranted. Another common limitation of studies examining predictors and outcomes of single-setting aggression is the use of a group-based approach in which participants are categorized based on arbitrary cut points, potentially weakening the prediction of differential adjustment outcomes.

An improved understanding of context-specific aggression will enhance risk assessment and inform the design of intervention programs for children displaying a specific profile of aggression that exists primarily in one context. Thus, the current study aimed to elucidate the relation between aggression at home and school, the unique effects of aggression at home and school, and the outcomes of context-specific aggression in childhood. We conceptualized aggression broadly, consistent with Achenbach's established measurement approach (Achenbach, 1991), to capture a range of aggressive behaviors that can occur across multiple relationship contexts. As such, we were able to compare the effects of aggression in specific contexts – home and school – without restricting the measurement approach to behaviors that were unlikely to occur in one context or the other (e.g., peer aggression at home).

Mother and father reports of child behavior at home and teacher and peer reports of behavior at school captured home-based and school-based aggression, respectively. More specifically, mother and father reports of aggressive behavior in kindergarten through second grade represented home-based aggression in childhood, and mother reports of aggressive behavior from sixth through eighth grade represented home-based aggression in early adolescence. Teacher and peer reports of aggressive behavior collected annually from kindergarten through second grade represented school-based

aggression in childhood, and teacher reports of aggressive behavior from sixth through eighth grade represented school-based aggression in early adolescence.

The first aim of the present study was to examine the extent to which aggressive behavior exists primarily at school, primarily at home, at both school and home, or in neither context. Correlations between home- and school-based aggression and group-oriented analyses using latent profile analyses were used to describe convergence and divergence across contexts as well as context-specific profiles.

The second aim was to examine the extent to which aggression in one context spreads to the other context across developmental periods. More specifically, home-based aggression in childhood was tested as a predictor of school-based aggression in early adolescence, controlling for earlier levels of school-based aggression. Similarly, school-based aggression in childhood was tested as a predictor of home-based aggression in early adolescence, controlling for earlier levels of home-based aggression.

Finally, the third aim was to examine the unique effects of aggression at home and school as well as the outcomes of context-specific aggression in childhood. We examined whether home- and school-based aggression in childhood (kindergarten – second grade) predicted academic achievement and peer adjustment in later childhood (third grade), as well as subsequent academic achievement, peer adjustment, and internalizing problems in early adolescence (ninth grade). When significant interactions between home- and school-based aggression arose, we compared the association between school-based aggression and selected outcomes at low levels of home-based aggression against the association between home-based aggression and selected outcomes at low levels of school-based aggression. We also used polynomial regression (i.e., interactions

between home- and school-based aggression as predictors of selected outcomes) with response surface analysis to examine whether convergences and divergences between home- and school-based aggression predicted adjustment outcomes. Response surface analyses yielded estimates of whether home-school convergence at higher levels of aggression predicted adjustment outcomes (i.e., slope and curvature of the line of congruence), as well as whether the direction or degree of divergence between home-and school-based aggression predicted adjustment outcomes (i.e., slope and curvature of the lines of incongruence; Edwards, 2002; Shanock et al., 2010).

II. LITERATURE REVIEW

Aggressive Behavior in Childhood and Adolescence

Aggressive behaviors tend to decrease during childhood (Tremblay, 2000) and continue to decrease through adolescence (Stanger et al., 1997). This pattern applies to a broad conceptualization of aggression, including hurtful, oppositional, and disruptive behaviors (Achenbach, 1991), though not necessarily to specific types of aggression, such as relational peer aggression. Upon the transition to elementary school, most children have attained cognitive and social skills that help regulate responses to frustration and anger and reduce negative interactions with others (Côté et al., 2002; Tremblay, 2000). Elevated levels of aggression in childhood and adolescence are consistently related to peer rejection (Bierman, 2004; Coie et al., 1990), poorer teacher-child relationships (Birch & Ladd, 1998), and poorer academic outcomes (Campbell et al., 2006, 2010). Early aggression has also been linked to increased rates of criminality and police contact in adulthood (e.g., Broidy et al., 2003; Fergusson et al., 2005), as well as mental health outcomes, with strong links between aggression and later internalizing problems such as depression (Cleverley et al., 2012). These findings appear to be essentially consistent whether aggression is measured in the home or at school (Evans et al., 2019), although few studies have compared aggression at school or at home specifically.

Aggression is also decidedly stable: children who exhibit elevated aggression tend to remain highly aggressive over time, whereas children who are less aggressive tend to remain less aggressive (e.g., Huesmann et al., 2009; Piquero et al., 2012). Several studies and meta-analyses have identified trajectories of aggression that can be traced from early childhood through adulthood (e.g., Nagin & Tremblay, 1999; Campbell et al., 2006).

These studies uniformly identify children who are consistently high and consistently low in aggression from childhood through adolescence (Tremblay, 2000). However, other patterns of increasing or decreasing aggression have also been identified.

Campbell et al. (2006) identified five unique trajectories with important differences between each group on levels of academic achievement, social skills, and mental health problems. Interestingly, differential outcomes were noticed even between children who showed consistently low levels of aggression and children who showed almost no (i.e., very low) aggression from toddlerhood to age nine. Even low levels of mother-reported aggression in childhood predicted negative outcomes, including lower academic achievement, lower teacher-reported social skills, higher teacher-reported externalizing behaviors and ADHD symptoms, and increased loneliness (girls only), compared to children who displayed almost no aggression. In addition, a "moderate-decreasing" trajectory was identified in which children displayed elevated levels of aggression in early childhood and decreased rapidly through middle childhood. Children following this trajectory did not show signs of later problems as compared to other groups (Campbell et al., 2006). These findings suggest that whereas aggression decreases, on average, as children age, subtle differences in the course of aggression predict developmental outcomes. Thus, aggressive behavior is relatively stable in childhood and early adolescence, but differences across time and setting may exist and predict psychosocial adjustment.

Theoretical Perspectives

Several broad theories of human development and socialization provide insights about behavioral differences across contexts: ecological systems theory, developmental systems theory, and group socialization theory.

Ecological Systems Theory

Bronfenbrenner's ecological systems theory (EST) addresses the importance of context in general (Bronfenbrenner, 1994). According to this theory, each child exists within many environments, or layers of context. The home and school environment are considered microsystems, the smallest and most intimate levels of influence. In the home and school microsystems, children form relationships with a variety of people including parents, siblings, teachers, and peers. EST acknowledges that changes or conflicts in one setting can affect other settings, which refers to mesosystem influences. For instance, aggressive family interactions can impact children's interactions with teachers and peers in the classroom (Dirks et al., 2015), and negative experiences at school can likewise spillover into interactions at home. Repetti (1996), for example, reported that experiences of academic failure and negative peer interactions at school predicted difficult and demanding behavior with parents at home. EST is not explicit, however, about how and why interactions are mirrored across settings for some children, whereas behavior is more context specific for other children.

Developmental Systems Theory

Developmental systems theory proposes that children first learn how to interact with others and respond to interpersonal challenges via interactions in the home (Ford & Lerner, 1992). More specifically, patterns of behavior and interactions within the family of origin can carry over into other settings, suggesting that difficulties in one context

might trigger difficulties in other contexts. An example is coercive family dynamics, in which escalating anger and aggression between caregivers and children reinforces coercive conflict resolution (Granic & Patterson, 2006; Patterson, 1982). For instance, a child's noncompliance may be met with parental anger and hostility, to which the child then responds with increased aggression until the parent gives in, potentially reinforcing aggression as a viable form of conflict resolution in other relationships and contexts (Bank et al., 1996).

Smith and colleagues (2014) found evidence consistent with spread of aggression from home to school in a study utilizing observed caregiver-child interactions. Results indicated that coercive interactions between parents and their preschoolers in the home predicted teacher-reported oppositional behaviors in elementary school, particularly when coercive interactions occurred consistently throughout early childhood (Smith et al., 2014). Similarly, Pettit et al. (1991) found that coercive parent-child interactions predicted aggression with peers, with social cognitions about the efficacy of aggression serving as a mediator. Aggressive interactions with siblings may also promote aggression in other contexts. For instance, Ensor and colleagues (2010) found that escalating physical aggression and coercion towards siblings in preschool was associated with aggressive social interactions with unfamiliar peers at age six.

Alternatively, it is also possible that experiences at school influence behaviors at home. For instance, Kaufman et al. (2020) discovered important bidirectional associations between parent and peer interactions over time. Of particular interest was the finding that peer victimization predicted increases in hostile and cold parenting, mediated by child conduct problems and bullying others. This finding suggests that negative

experiences at school may spillover into the home context and negatively influence family interactions. Thus, according to developmental systems theory, high levels of aggression at home would eventually lead to elevated levels of aggression in the school context; the opposite may also be true, with high levels of aggression at school translating into more aggression at home.

Group Socialization Theory

Group socialization theory posits that socialization, the way children learn how to become functioning participants in society, is highly context specific. While acknowledging the early salience of the home environment, GST contends that children figure out the most adaptive ways to behave in each environment when they are exposed to multiple environments, such as the family at home and the peer group at school (Harris, 1995). They may encounter different experiences and behavioral norms and contingencies (e.g., responses to displays of emotion) in each setting. Thus, aside from some similarity in behavioral patterns across settings due to genetic influences, only behaviors that are functional in both contexts will overlap, and thus the spread of aggression from home to school is not inevitable (Harris, 1995). GST also contends that peer group influences on personality ultimately override parental influences because the peer group is the primary functional setting beyond childhood. Thus, according to group socialization theory, early levels of aggression at home or school would not necessarily predict later levels of aggression in a different context. Moreover, aggression at school would be a more powerful predictor of later outcomes than aggression at home.

Whereas research has shown that aggressive behaviors are fairly stable (e.g., Huesmann et al., 2006), relatively few studies have examined the extent to which

aggressive behaviors spread across settings, consistent with DST, or occur primarily within a certain context, consistent with GST.

Informant Discrepancies or Context Differences?

Interest in informant discrepancies has increased over the last decade as evidence emerged indicating discrepant reports were often more than simply measurement error and could contribute uniquely to a variety of questions concerning development across the lifespan. Agreement among reporters across contexts, such as parents and teachers or peers, tends to be modest to moderate (e.g., Achenbach et al., 1987; Clay et al., 2008; De Los Reyes et al., 2015; Grietens et al., 2004) across a variety of behaviors. An early meta-analysis conducted by Achenbach et al. (1987) examined correspondence among a variety of reporters on behavioral and emotional problems of youth between the ages of one and nineteen. The overall mean correlation between parents and teachers was .28, and more specifically, when parents and teachers reported on under-controlled problems the correlation was .32. A more recent cross-cultural meta-analysis conducted by Rescorla and colleagues (2014) examined parent-teacher concordance on CBCL and TRF items and revealed modest agreement across domains (e.g., r = .32 for externalizing, r = .21 for internalizing). Moreover, a recent study by Santos and colleagues (2020) reported a correlation of .21 between parent and teacher reports of aggressive behavior specifically, as measured on the CBCL and TRF. Correlations between parent and teacher reports are consistent with evidence that behaviors are somewhat trait-like, observable across contexts and time, though the low magnitude of correlations suggests that behaviors are also somewhat context specific.

Low concordance between parents and teachers, especially in studies utilizing the CBCL and TRF, also suggests that informants are mainly reporting on behaviors they observe in the setting in which they are situated. Informants in different contexts, such as parents and teachers, may learn about a child's behavior in the other context (e.g., teachers inform parents about behavior at school), but modest cross-context correlations suggest that awareness of behaviors in other contexts does not strongly influence informants.

Correlations between informants within settings reflect the contribution of context in addition to traits that may be shown across settings. Correspondence within context, such as between mothers and fathers or between teachers and peers, is moderate to high (e.g., De Los Reyes et al., 2015; De Los Reyes et al., 2016; Duhig et al., 2000; Grietens et al., 2004). Achenbach et al. (1987) reported an average correlation of .60 between parents. Similarly, Grietens et al. (2004) found mother and father reports of total problems were correlated at .60 in a non-clinical sample of five- and six-year-olds. In a more recent review conducted by De Los Reyes and colleagues (2015), the overall correspondence between mothers and fathers for externalizing behaviors was .58. Higher levels of correspondence within a setting, as compared to across settings, demonstrates the context-specificity of aggression. Of course, it is unlikely that any two reporters would completely agree, as measures are imperfect reflections of actual behavior; the remaining differences may also be attributable to informant biases.

Further evidence of the important role of context is provided by an experimental study conducted by De Los Reyes and colleagues (2009). Results indicated that disruptive behavior reported by teachers and parents mapped on to observed behavior in

laboratory tasks with non-parental adults and parents. That is, children described as disruptive by teachers but not parents were similarly disruptive with non-parental adults but not with parents during laboratory tasks. Children with reports of cross-contextual difficult behavior likewise displayed disruptive behavior with both parents and non-parental adults during laboratory tasks. These results lend support to the expectation that children may display different patterns of behavior depending on context, and in turn, behavior in a specific context may be uniquely related to outcomes. This study also reinforces the idea that informants primarily report on behavior displayed in the context in which they are situated.

The aforementioned findings are consistent with two theoretical frameworks developed by De Los Reyes and colleagues (2005, 2019) which emphasize the importance of context-specific behaviors. The Operations Triad Model (OTM) and the Attribution Bias Context (ABC) Model provide support for setting-specific patterns of child behavior and detail the ways in which informants may systematically differ; specifically, informant attributions and biases and the context in which behaviors are observed are all identified factors contributing to divergence. Several assumptions about the nature of informant discrepancies as presented in the ABC Model and the OTM offer support to the current study. First, concordance tends to be greater when informants are reporting on observable behaviors such as externalizing problems than when reporting on internally experienced problems such as anxiety or depression (Achenbach et al., 1987). Second, and perhaps most pertinent to the current study, informant dyads who interact with children in the same context (e.g., mothers and fathers; peers and teachers) tend to have greater levels of agreement than informant dyads who interact with children in

different contexts (e.g., parents and teachers) (Achenbach et al., 1987). While informant attributions and biases exist, the current study attempts to reduce the influence of informants and target the influence of context by capturing the shared variance in aggression between multiple informants in each context (mothers and fathers at home and teachers and peers at school).

Aggression in the Home Context

The development of aggression is often traced to characteristics of the early home environment. For example, harsh parenting, including physical punishment and psychological control, predicts later aggression (e.g., McFadyen-Ketchum et al., 1996; Shaw et al., 2001). Given that the home is typically where children accomplish early developmental tasks, including attachment to a familiar adult, compliance with basic instructions, self-control of physical aggression, and appropriate play (Masten et al., 2006), it is unsurprising that this setting is highly significant in both the development and maintenance of aggressive behaviors.

At home, parents fulfill specific socialization functions for their children, including protection when distressed, reciprocal interaction, social and cognitive guidance, behavioral control, and cultural group participation (Grusec, 2019). Evidence of bidirectionality in parent-child relationships (e.g., Pettit & Arsiwalla, 2008) suggests that children's aggressive behavior at home may interfere with these parental socialization efforts. For example, when children are aggressive, parents may focus on behavioral control at the expense of other socialization roles such as guidance and group participation (Grusec, 2019; Grusec & Davidov, 2010; Hastings & Rubin, 1999).

Children's aggression in the home may elicit feelings of anger and frustration in parents, who may then respond with power assertion or coercion (Dodge et al., 1994; Rubin, 1995). For example, Stormshak and colleagues (2000) found that child aggression was related to higher levels of punitive parenting (e.g., yelling, nagging, threatening) and spanking. Similarly, emphasizing the bidirectional nature of aggression in the home, MacKenzie et al. (2015) found that maternal spanking predicted increases in externalizing behaviors over time, but child externalizing also predicted increases in maternal spanking across childhood. Besnard and colleagues (2013) reported that children's disruptive behavior begins to influence mothers' and fathers' hostile parenting as well as mothers' affective rejection in middle childhood, provoking more hostile parenting and less instances of positive parenting (Besnard et al., 2013). These studies suggest that child aggression can elicit negative parenting, fueling negative cycles that impair relationships and socialization functions, and thereby potentially contribute to broader patterns of aggression across contexts (Combs-Ronto et al., 2009; Patterson, 1982; Rubin, 1995; Sheehan & Watson, 2008).

Aggressive interactions with siblings may also contribute to the spillover of aggressive behavior from the home to school context. For instance, in a review of the literature, Dirks and colleagues (2015) reported that sibling conflict and hostility are associated with lower perceived social competence and contribute independently to later aggressive and delinquent behavior. Thus, children's aggressive behaviors with parents and siblings at home can escalate over time and potentially spread to other settings via social learning (Patterson, 1982) and disruptions in positive socialization functions (Grusec, 2019).

Hostility and aggression between parents and children are logical predictors of later aggression and externalizing behavior, and these negative parent-child interactions also predict internalizing problems (e.g., Burnette et al., 2012; Rogosch et al., 2010; Lee Wiggins et al. 2015). For instance, Langevin et al. (2020) found that mothers' verbal aggression, such as insulting and threatening their children, predicted increased internalizing problems. Relatedly, Fite and colleagues (2014) found associations between reactive aggression and later internalizing problems for adolescent males, particularly in the context of problematic parent-child relationships. These studies support the notion that early aggression in a variety of relationships can contribute to increased internalizing problems later in development.

Aggression in the School Context

As children age, environments outside the home become increasingly salient (Larson & Verma, 1999). School, in particular, presents behavioral and academic expectations that are not necessarily present in the home, along with opportunities to build relationships with non-familial peers and adults. Critical developmental tasks of middle to late childhood are accomplished largely through school, including learning academic subjects, following rules for behavior in a group context, getting along with peers, and making friends (Masten et al., 2006). Although there is little empirical evidence of the long-term impact of context-specific aggression occurring at school only, children's aggressive behavior at school likely undermines the pursuit of school-based developmental tasks, including disruption of learning objectives and peer and teacher relationships, thereby compromising long-term adjustment (Thomas et al., 2008). Children displaying aggression at home upon the transition to kindergarten may have

difficulty conforming to classroom rules and building friendships, while children with little to no prior aggression may develop aggressive behaviors stemming from the challenges of novel demands at school (e.g., Dishion & Tipsord, 2011; Snyder et al., 2005).

The school context also widens youths' exposure to peers, one of the most salient influences on the development and maintenance of aggressive behavior (Dishion & Tipsord, 2011). Children who exhibit a broad pattern of aggressive behaviors in the school setting tend to experience peer rejection and deviant peer affiliations (e.g., Vitaro et al., 2018; Vitaro et al., 2007). Peer rejection at school can contribute to loneliness both concurrently and across the transition to middle school (Rotenberg, 2019), and both aggression at school and peer rejection have been linked to long-term academic, behavioral, and mental health problems (Parker & Asher, 1987; Ryan & Shin, 2018), showcasing the variety of ways in which aggressive behaviors at school can impact developmental outcomes.

Teacher-child relationships are also impacted by aggression at school. More teacher-child conflict occurs for aggressive children compared to nonaggressive children (Murray & Zvoch, 2011; Nurmi, 2012). Aggression and corresponding teacher-child conflict can lead to disruptions in instructional time, lower grades, and school disliking (Birch & Ladd, 1997; Hamre & Pianta, 2001; Sutherland & Oswald, 2005). For example, Baker, Grant and Morlock (2008) found that greater conflict in teacher-student relationships in elementary school was negatively associated with markers of school adaptation including reading scores and classroom adjustment. In addition, Silver and colleagues (2005) found that conflict in the teacher-child relationship predicted

externalizing behaviors above and beyond negative parenting and prior child behavior. On the other hand, teacher-child relationships can also be protective. Maldonado-Carreño and Votruba-Drzal (2011) found that both mothers and teachers reported lower levels of externalizing behaviors from kindergarten to fifth grade when teacher-child relationship quality was high (based on teacher-reported conflict and closeness). Thus, while the impact of aggression at school is multi-dimensional, the unique contributions of school-based aggression and the effects of aggression that occurs primarily at school remain unclear.

Importance of Context-Specificity and Relevant Studies

The differences between parent and teacher ratings of children's aggressive behavior are well established (see Achenbach, 2006; De Los Reyes & Kazdin, 2005), but less is known about outcomes related to child aggression in the home or school specifically. The most relevant studies of context-specific aggression are summarized below.

Fergusson, Boden, and Horwood (2009) investigated the impact of situational versus generalized conduct problems utilizing a twenty-five-year longitudinal birth cohort study of 1,265 New Zealand-born children. In this study, children were dichotomized utilizing a 10% cut-point; children in the top 10% were considered to have conduct problems. Conduct problems, based on both mother and teacher reports of behaviors such as disobedience and aggression, were assessed at ages seven, eight, and nine. A latent class analysis was conducted to better understand the prevalence of situational versus generalized conduct problems. Results confirmed a four-group solution, including children with "no problems" (n = 899), "mother-reported problems"

(*n* = 45), "teacher-reported problems" (*n* = 64), and "generalized problems" (*n* = 38). Long-term outcomes were measured from ages 16-25. Results showed that children with situational and generalized conduct problems reported the worst outcomes related to criminal activity, substance use/abuse, mental health, and relationship problems, compared to children with no reported conduct problems. Interestingly, long-term outcomes were not significantly different for children showing conduct problems in one setting, compared to children with more generalized conduct problems. This suggests that problems do not need to spread across settings to have detrimental long-term effects, which is somewhat surprising given the accumulation of risks associated with aggression in each setting. In addition, results indicated the impact of conduct problems in either setting on a range of outcomes. A limitation of this study, however, is the use of dichotomization, in which children were grouped as either having or not having conduct problems, rather than utilizing continuous scores to determine the degrees to which children displayed conduct problems in each setting.

A more recent study conducted by Sulik and colleagues (Sulik, Blair, & Greenberg, 2017) utilized a latent class analysis approach to understand contextual differences in externalizing behavior problems among young children. The large sample (*N* = 1,292) included children from rural and small towns in the United States. Primary caregivers completed the Strengths and Difficulties Questionnaire (SDQ) when children were 60 (T1) and 90 months old (T2); teachers also completed the SDQ annually from pre-kindergarten until second grade. Parent reports were matched to the closest teacher report collected within one year of the parent assessment. Results were similar to the previous study, yielding a four-class solution including "low cross-context" (54% at T1),

"home context" (27% at T1), "school context" (12% at T1), and "high cross-context" (6% at T1) symptoms. Interestingly, home context problems were more prevalent than school context problems, but most children displayed few problematic behaviors in either context.

Although this study did not consider outcomes of group membership, a latent transition analysis indicated that class membership was moderately stable for all groups. That is, children were most likely to remain in the same class from T1 to T2. Moreover, problems were more likely to decrease, rather than spread or escalate from T1 to T2 (approximately 30 months). For instance, children in the home context or school context groups at T1 were most likely to transition to the low cross-context group at T2 (21% and 28%, respectively). These findings indicate the relative stability of group membership, even with most children encountering new teachers each school year.

Taking a slightly different approach, Ferdinand, van der Ende, and Verhulst (2007a) compared parent and teacher reports of behavioral and emotional problems as well as parent-teacher discrepancies about problem behaviors as predictors of early adulthood outcomes. The subsample for this study was drawn from a larger study of Dutch children (N = 2,600) and included 1,154 children who were between the ages of 4 and 12 in 1983 (T1). Parent and teacher data were collected at T1 via the CBCL and TRF respectively, and outcomes related to mental health problems and substance use/abuse were measured in 1997 (T6) via parent and self-report when participants were between the ages of 18 and 26. Results indicated that parent-reported aggressive and delinquent behavior at T1 were stronger predictors of youth-reported tobacco and drug use and

externalizing problems, as well as parent-reported externalizing problems at T6, compared to teacher reports.

Discrepancy scores were calculated by subtracting each T1 TRF scale score (i.e., aggression, delinquent behavior) from each respective T1 CBCL scale score. Three groups were then created: teachers reported more problems than mothers, teachers and parents reported scores in a similar range, and mothers reported more problems than teachers. Only one outcome, youth-reported risk of suicide attempts or self-mutilation, was predicted by parent-teacher discrepancies. More specifically, if parents reported much more aggression than teachers, participants were at higher risk for self-harm during young adulthood. While interesting, these results are limited due to participant ages spanning a wide range at T1 and T6, thus failing to clarify whether differential effects were present for parent- and teacher-reports in childhood versus early adolescence.

Interestingly, Ferdinand and colleagues (2007b) conducted a similar study using a sample of clinically referred children and did not find the same results. Participants were pulled from a larger study and were included if they were referred between the ages of 6 and 12 (T1), had CBCL and TRF data from T1, and completed a follow-up about six years later (T2) when they were between the ages of 12 and 18 (n = 532). Parent-teacher discrepancies in childhood and adolescence did not predict any of the parent-reported outcomes at T2, including police contact, self-harm, and discipline problems at school. Importantly, however, additive effects were found such that when both parents and teachers reported high levels of aggressive and delinquent behavior (respectively), the risk for police contact at T2 was greater. These findings suggest that children who display aggressive behavior both at school and at home are at highest risk for later adjustment

problems, but the unique impact of aggression in only one context remains unaddressed. In addition, the use of parent-reported outcomes may both underestimate negative outcomes at T2 and conflate results with the same informant for both predictor and outcome variables.

Taking yet another statistical approach, Mannuzza, Klein, & Moulton (2002) investigated the long-term outcomes associated with pervasive ADHD (problems reported both at school and at home) and situational ADHD (problems reported only at home or only at school) among middle- to low-income European American boys. Inclusion in pervasive or situational groups were based on teacher reports (Conners Teacher Rating Scale; CTRS) and parent reports (Parent Home Hyperactivity Scale) in conjunction with the child's psychiatrist's input and social worker ratings based on an interview with parents. The sample consisted of 410 boys between the ages of 6 and 12, in which 232 participants were clinically referred (n = 194 pervasive, n = 24 school only, n = 14 home only) and 178 were unreferred comparison children. Clinical interviews with participants and parents at follow-up twelve years later assessed a variety of young adult outcomes such as mental health, substance use, and conduct disorder via the NIMH Diagnostic Interview Schedule and the Teenage or Young Adult Schedule (TOYS). Results suggested that children with pervasive ADHD and school-only ADHD are more similar than those with home-only ADHD or a comparison group without ADHD on measures of mental health in young adulthood. More specifically, conduct disorder and antisocial behavior were significantly more prevalent at follow up in the pervasive ADHD and school-only ADHD groups, as compared to the home-only and comparison groups. Academic outcomes also differed, with youth in the school-only ADHD group at

T1 reporting less formal schooling completion and more failed classes at T2 than those with home-only ADHD. Although this was a clinical study specific to ADHD diagnoses, these results suggest that behavior problems specific to the school setting might be more detrimental long term than problematic behavior contained to the home context, particularly if the behaviors interfere with learning. Some ADHD-related behaviors interfere with learning and overlap with aggressive behaviors, such as disruptive behaviors. Results also highlight the importance of teacher-reported problems in the classroom.

The studies reviewed above offer important information on context-specific behaviors, but several gaps in the literature remain. First, several of the studies used group-based analyses that relied on arbitrary or clinical cut points in the determination of whether behavior is problematic. Whereas this group-oriented approach may be particularly useful for mental health clinicians or health care providers, group-based analyses also tend to eliminate more normative variability, and group differences may not be meaningful, weakening the ability to predict differential adjustment outcomes. Moreover, two studies relied on a clinical or referred sample, which may not reflect a more normative community sample (Ferdinand et al., 2007b; Mannuzza et al., 2002). In addition, only four studies considered outcomes associated with setting-specific behaviors (Ferdinand et al., 2007a, 2007b; Fergusson et al., 2009; Mannuzza et al., 2002).

Dirks and colleagues (2012) emphasized the importance of elucidating the impact of situationally specific problematic behavior. They concluded that more evidence is needed to determine the outcomes of problematic behaviors identified within and across informants and settings. The current study hopes to fill these gaps by preserving

continuous mother, father, teacher, and peer ratings of aggressive behavior; testing the spread of aggressive behavior across contexts; and including long-term, self-reported or school-based (i.e., independently measured) outcomes across two developmental periods.

The Present Study

The present study examined the relation between aggression at home and school, the unique effects of aggression at home and school, and the outcomes of context-specific aggression (i.e., aggression that occurs primarily in one context) in childhood. This study advances the existing literature on context-specific aggression in several ways. First, rather than a group-based analysis with arbitrary or clinical cut points that erase variability in aggression, we examined aggression in its natural, continuous form. We also used multiple informants of aggression at home (mothers, fathers) and school (teachers, peers) to capture context-specific variance rather than assuming similar manifestations and outcomes across settings. Finally, whereas aggression was measured with parent, teacher, and peer reports, the outcome measures were objective reports of academic achievement and self-reported internalizing and peer adjustment to minimize common informant bias.

We used a large sample and a multi-method, longitudinal design to address three aims. First, to describe cross-context convergence and divergence in aggression as well as context-specific profiles, we analyzed the correlation between latent variables representing home- and school-based aggression and conducted a latent profile analysis with measures of home- and school-based aggression. These analyses concerned the extent to which childhood (kindergarten through second grade) aggressive behavior exists primarily at school, primarily at home, at both school and home, or in neither context.

We hypothesized that the correlation between the latent variables representing aggression at home and aggression at school would be moderate. A prior study utilizing the same data set as the current study reported a correlation of .30 between mother-reported externalizing behavior and a teacher-peer composite of externalizing behavior (Deater-Deckard et al., 1996). We also hypothesized that the majority of children would display low levels of aggression across contexts and only a small percentage would display high levels of aggression at both home and school, consistent with prior research (Fergusson et al., 2009; Mannuzza et al., 2002; Sulik et al., 2017). In addition, we expected that a larger percentage of children would display aggression primarily at home than primarily at school. This is consistent with prior research using similar age groups, which has found that mothers tend to report more aggression than teachers (e.g., Keiley et al., 2000; Van der Ende & Verhulst, 2005; Youngstrom et al., 2000). Profiles generated by the latent profile analysis were expected to map on to four-group solutions (aggressive at home-only, school-only, both home and school, and low aggression in both contexts) found in prior studies of context-specific externalizing problems (e.g., De Los Reyes et al., 2009; Sulik et al., 2017).

The second aim of the present study was to examine the extent to which aggression spreads across contexts and developmental periods. Home-based aggression in childhood (kindergarten through second grade) was used to predict school-based aggression in early adolescence (sixth through eighth grade), controlling for school-based aggression in childhood. Similarly, school-based aggression in childhood was used to predict home-based aggression in early adolescence, controlling for home-based aggression in childhood.

We hypothesized that the latent variable representing child aggression at home (indicated by mother and father reports in kindergarten through second grade) would predict the latent variables representing adolescent aggression at home (indicated by mother reports in sixth through eighth grade) and adolescent aggression at school (indicated by teacher reports in sixth through eighth grade). These hypotheses were based on research suggesting that aggression is stable (Huesmann et al., 2009; Olweus, 1979; Piquero et al., 2012) and that interactions in the family of origin tend to set the stage for interactions in other contexts such as school (Dishion & Patterson, 2006; Patterson, 2002). Additionally, we hypothesized that the latent variable representing child aggression at school (indicated by teacher and peer reports in kindergarten through second grade) would predict the latent variables representing adolescent aggression at school and home. These hypotheses were based on ecological systems and developmental systems theories, which suggest that negative experiences in one setting can spill over into other settings, such that aggressive behavior at school and the associated consequences are expected to impact the home context over time.

The third aim was to test the unique effects of aggression at home and school as well as the outcomes of context-specific aggression. That is, we were interested in both the main effects of home- and school-based aggression, as well as impact of aggression that occurred primarily at home or at school. We examined whether home- and school-based aggression in childhood (kindergarten through second grade) uniquely predicted academic achievement and peer adjustment in later childhood (third grade), as well as subsequent academic achievement, peer adjustment, and internalizing problems in early adolescence (ninth grade).

To examine whether convergences and divergences between home- and school-based aggression predicted adjustment outcomes in childhood and early adolescence, we used polynomial regression with response surface analyses (PR + RSA; Edwards, 2002; Laird & De Los Reyes, 2013; Shanock et al., 2010). Response surface analyses yielded estimates of whether home-school convergence at higher levels of aggression predicted higher or lower levels of adjustment outcomes (i.e., slope and curvature of the line of agreement), as well as whether context-specific aggression (i.e., aggression occurring in one setting but not the other) predicted adjustment outcomes (i.e., slope and curvature of the lines of incongruence; Edwards, 2002; Shanock et al., 2010).

We expected an independent association between school-based aggression in childhood and academic outcomes in both third and ninth grade such that higher levels of school-based aggression would predict lower academic achievement. We also hypothesized that there would be a significant interaction between home- and school-based aggression such that school-based aggression would more strongly predict academic outcomes in both third and ninth grade when home-based aggression was low, as compared to the association between home-based aggression and academic outcomes when school-based aggression was low. Finally, we expected response surface analyses to reveal a significant slope on the line of incongruence indicating that academic outcomes would be worse when school-based aggression was greater than home-based aggression than vice versa. These hypotheses emphasize the expectation that aggression in the school context is more problematic for academic outcomes, drawing from an extensive research base indicating the variety of ways aggressive behavior at school can undermine learning (e.g., Baker et al., 2008) through disruption of instructional time,

poor teacher-child and peer relationships (Birch & Ladd, 1998; Ryan & Shin, 2018), and time spent out of the classroom (Bierman et al. 2013).

Next, we hypothesized that both home- and school-based aggression in childhood would significantly predict peer adjustment, such that higher levels of aggression at home and higher levels of aggression at school would each predict lower levels of peer adjustment in third and ninth grades. We based this hypothesis on research that cites both coercive and hostile parent-child interactions (e.g., Pettit et al., 1991; Tung & Lee, 2018) and aggression in the peer group (e.g., Coie et al., 1990; Lansford et al., 2010) as predictors of later social difficulties and peer rejection. Given the expectation of independent effects of both home and school aggression, we also expected a positive and significant slope on the line of agreement in RSA analyses, such that home-school convergence at higher levels of aggression would predict more peer adjustment problems in both third and ninth grade.

The association between context-specific aggression and internalizing across developmental periods is less clear and therefore analyses were more exploratory. Internalizing related to school-based aggression may stem from distress due to peer rejection or teacher conflict (Rotenberg, 2019), whereas internalizing related to home-based aggression may stem from distress associated with negative parent-child or sibling interactions at home or rejection by family members (e.g., Low & Stocker, 2005; Sheeber et al., 1997). Therefore, we hypothesized that home- and school-based aggression in childhood would each independently predict internalizing problems in ninth grade. Given the expectation of independent effects of both home and school aggression, we hypothesized RSA results would reveal a positive and significant slope on the line of

agreement such that home-school convergence at higher levels of aggression would predict more internalizing problems in ninth grade. Thus, we predicted that the effects of aggressive behavior in either context, and particularly in both contexts, could be detrimental to feelings of self-worth and contribute to internalizing problems during early adolescence.

III. METHOD

Participants

The families in the current investigation were participants in the Child Development Project, a multisite longitudinal study of children's social and emotional development (Dodge et al., 1990). Two cohorts of participant families were recruited from three sites: Knoxville and Nashville, Tennessee and Bloomington, Indiana. Most participants were recruited at kindergarten pre-registration during two consecutive years (1987 and 1988). Research assistants approached parents and asked if they would be interested in participating in a longitudinal study of child development; 70% of parents contacted agreed to participate. A small percentage of participants who did not preregister (15%) were recruited on the first day of school either by phone, letter, or through the schools. The sample consisted of 585 families at the first assessment. Males comprised 52% of the sample. Eighty one percent (81%) of the sample were European American, 19% were Black or another ethnic minority. The Hollingshead Four-Factor Index of Socioeconomic Status (1979) indicates a primarily middle-class sample (M = 39.5; SD = 14.1), although a range of statuses were apparent with 9%, 17%, 25%, 33%, and 16% in Hollingshead's five classes (from lowest to highest).

Table 1 provides the number of participants for whom data are available across years and measures. By third grade, 82% of children continued to participate in the study (n = 477), by ninth grade 71% of youth continued in the study (n = 411). Generally, participants with missing data differed only modestly from those with data. As an example, participants missing data on mother-reported aggression in eighth grade were rated as slightly more aggressive by fathers (t (379) = 1.98, p = .05) in kindergarten, but

not by mothers (t (146.33) = 1.14, p =.25) or teachers (t (230.99) = 1.77, p = .08). Participants missing data on mother-reported aggression in eighth grade were more likely to be male (χ^2 (1) = 5.10, p = .02) and from a lower SES (t (568) = -2.23, p = .03) than those who were not missing mother data in eighth grade. No significant differences were found by race. Father reports were less consistently available in childhood, perhaps due to the significant portion of participants residing in single mother households (24%). Indeed, caregiver marital status was significantly related to missing father data in kindergarten (χ^2 (7) = 385.07, p < .001). Participants missing father reports in kindergarten were from lower SES families (t (568) = -11.22, p < .001), however no differences were observed by race or gender.

Procedures

The first assessment was conducted the summer prior to kindergarten or early fall. Extended face-to-face interviews with parents (mostly mothers) included detailed information about family history, parenting, and child characteristics. Subsequent assessments were completed annually via either mailed questionnaires or interviews. Teachers completed questionnaires each spring.

The larger study from which the data are drawn included measures and waves that are not used in the present study; only procedures and measures relevant to the present study are described here (see Table 1). The present study used data from Year 1 through Year 10 of the larger study (kindergarten through ninth grade). Mothers and fathers reported on their child's aggressive behavior annually from kindergarten through second grade, and mothers also reported on their child's aggressive behavior from sixth through eighth grade. Teachers reported on children's aggression each spring from kindergarten

through second grade as well as sixth through eighth grade. Participant classrooms completed annual sociometric interviews in the winter, and children reported on their own perception of peer adjustment in third grade. Children also rated their own peer adjustment and internalizing problems in ninth grade. Academic achievement was assessed via school records collected in the spring of third and ninth grades.

Measures

Home-based Aggression

Mothers and fathers provided ratings of aggression on the 20-item aggressive behavior subscale of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001), which consists of 112 total items. Example items include "argues a lot," "physically attacks people," and has "temper tantrums or a hot temper." Items were rated on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true). Both mother and father ratings were included from kindergarten through second grade, while only mother reports were available for sixth through eighth grades. The availability of father reports ranged from 381 in kindergarten to 289 in second grade. Mother reports were more consistently available and ranged from 567 in kindergarten to 440 in second grade. Aggression was rated reliably across informants and waves (e.g., mother reported aggression in kindergarten, α = .87).

School-based Aggression

Teachers provided ratings of aggression on the 25-item aggressive behavior subscale of the Teacher Report Form (TRF; Achenbach, 1991) annually. Example items include "gets in many fights," "explosive and unpredictable behavior," and "shows off or clowns." Items were rated on a 3-point scale indicating how much each statement applied

to the target child (0 = not true, 1 = somewhat or sometimes true, 2 = very true or often true). The current study used teacher reports from kindergarten through second grade and sixth through eighth grade. Reliability was high across elementary school (α range = .94 - .96) and middle school (α range = .95 - .96).

Sociometric interviews conducted via the protocol described by Coie et al. (1982) took place in participants' classrooms each winter. Classmates of each target child were included if parental permission to participate was obtained (89% on average; range of 43% - 100% in each classroom). Children were asked to nominate up to three peers who started fights, were mean, and got angry. Nomination scores for each item were standardized and averaged to create a reliable measure of peer-reported aggression (α range = .84 - .88).

Academic Achievement

In kindergarten, teachers reported on the target child's performance in each of three subjects: reading, writing, and math. Teachers responded on a 4-point scale (0 = failing, 1 = below average, 2 = average, 3 = above average). These three scores were averaged to create an overall academic achievement score for kindergarten (α = .91). Standardized test information was not available to incorporate into the kindergarten composite. Academic achievement in kindergarten was used as a control variable when predicting later levels of academic achievement.

In third and ninth grades, academic achievement was based on grades and standardized test scores obtained from school records. Grades were recorded at the end of each school year and were converted to a numerical score ranging from 1 to 13 in order to account for variability in grading scales across schools and project years. A "1"

indicated a failing grade and "13" indicated the highest possible grade. Numerical scores in three subject areas (math, language arts, and science) were averaged to create a composite grade point average (GPA). In addition, standardized achievement test scores for language and math were included. Percentile rankings were used, and a composite was calculated by averaging the summary scores for third (α = .81) and ninth grade (α = .89). Because the composite GPA and achievement test scores were significantly correlated (e.g., third grade r = .69, p < .001; ninth grade r = .48, p < .001), the two scores were standardized and summed to create a single measure of academic achievement for third and ninth grades.

Peer Adjustment

In kindergarten, peer adjustment was measured with social preference scores derived from sociometric nominations from all classmates of the target child who obtained parental permission to participate (86% on average; range of 47% - 100%). Children were asked to choose the three classmates they liked the least and the three classmates they liked the most from a set of pictures. "Liked-most" and "liked-least" scores were created by summing and then standardizing the number of nominations each child received on the liked-most and liked-least questions. Social preference scores were created by subtracting the liked-least score form the liked-most score, and then standardizing.

Third-grade peer adjustment was measured with children's self-reported social acceptance on the Me and My Friends questionnaire. The scale is an adaptation of the Harter Self-Perception Profile for Children (Harter, 1983; G. Pettit, personal communication, September 18, 2020) specifically the Social Acceptance subscale, in

which children decide whether their own experiences are more similar or dissimilar to the statement provided. Ten questions were selected for the present study (e.g., "Some kids are very happy with how much other kids like them BUT other kids are not at all happy with how much other kids like them" and "Some kids have an easy time getting other kids to play with them BUT other kids have a hard time getting other kids to play with them"). Higher scores on this scale indicate higher social acceptance. Reliability was acceptable (α = .66).

In ninth grade, peer adjustment was measured with adolescents' self-reported social problems on the Youth Self Report (YSR; Achenbach & Rescorla, 2001). Adolescents reported on each item using a 3-point scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very or often true). The social problem subscale includes eight items, such as "I don't get along with other kids" and "I get teased a lot." Reliability was acceptable (α = .64).

Internalizing Problems

In kindergarten, mother-reported internalizing problems were measured via the 31-item internalizing subscale of the CBCL (Achenbach & Rescorla, 2001). Mothers reported on each item using a 3-point scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very or often true). Example items include "complains of loneliness" and "feels worthless or inferior." Teacher-reported internalizing problems in kindergarten were measured via the 35-item internalizing subscale of the TRF (Achenbach & Rescorla, 2001). Teachers reported on each item using a 3-point scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very or often true). Example items include

"overconforms to rules" and "shy or timid." Mother and teacher reports were used as control variables in analyses predicting later levels of internalizing problems.

In ninth grade, adolescents completed the internalizing subscale of the Youth Self Report (YSR; Achenbach & Rescorla, 2001). Adolescents reported on each item using a 3-point scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very or often true). The internalizing behavior subscale is comprised of thirty-one items, including "I cry a lot" and "I feel worthless." Reliability was high (α = .89).

Control Variables

Gender, race/ethnicity, and socioeconomic status (SES) were considered as possible control variables and were included in instances where they were correlated with both predictor and outcome variables. Mothers reported on the target child's gender and race during the initial interview in kindergarten. Gender and race were dichotomized for all analyses such that 1= female and 0 = male, and 1 = white and 0 = Black or other ethnic minority race. SES was measured in kindergarten according to the Hollingshead Four-Factor Index (Hollingshead, 1975). Academic achievement, peer adjustment, and mother and teacher reports of internalizing problems in kindergarten as described above served as control variables in models that predicted later levels of the respective variable.

Plan of Analysis

Correlations between the latent variables representing home-based aggression and school-based aggression were used to examine cross-context convergence and divergence in aggression for Aim 1. In addition, a latent profile analysis (LPA) was used to examine the prevalence of context-specific aggression at home and school during childhood.

To determine the appropriate number of profiles, independent models were estimated in an iterative manner, beginning with one latent class until optimal fit was reached. Each subsequent model was compared to the previous model with one less class. Fit estimates were based on the Akaike Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwarz, 1978), the Lo-Mendell-Rubin adjusted likelihood ratio test (LRT; Nylund et al., 2007) and the entropy (Clark & Muthén, 2009). To select the final model, we used the following criteria: 1) a lower AIC, 2) a lower BIC, 3) a significant adjusted LRT, 4) a higher entropy (Celeux & Soromenho, 1996), and 5) the meaning and interpretability of latent profiles based on theory.

To examine the extent to which aggression in one context predicted aggression in another context over time for Aim 2, a cross-lagged panel model was fit using the latent variables that represented aggression at home and school during childhood and early adolescence (see Figure 1). Home-based aggression in adolescence and school-based aggression in adolescence were regressed on the demographic control variables of gender, race, and SES, as well as home-based aggression in childhood and school-based aggression in childhood.

To test the unique effects of aggression at home and school as well as the outcomes of context-specific aggression, we conducted polynomial regression analyses in which home- and school-based aggression in childhood (kindergarten through second grade) latent variables were used as predictors of academic achievement and peer adjustment in later childhood (third grade), as well as subsequent academic achievement, peer adjustment, and internalizing problems in early adolescence (ninth grade). Earlier (kindergarten) levels of the outcome variable and demographic variables (when

correlated with both predictors and outcomes) were entered on the first step of the model, home-based and school-based aggression latent variables were entered on the second step, home-based and school-based aggression variables squared were entered on the third step, and the interaction between latent home-based and school-based aggression variables were entered on the fourth step (Laird & De Los Reyes, 2013; Laird & LeFleur, 2016). Separate regression analyses were conducted for each childhood outcome in third grade (academic achievement and peer adjustment) as well as subsequent academic achievement, internalizing problems, and peer adjustment in ninth grade.

Follow-up analyses were conducted for significant interactions. Simple intercepts and slopes were calculated according to standard procedures (Aiken & West, 1991). Intercepts and slopes representing the relationship between home- or school-based aggression and outcome variables (academic achievement, quality of social interactions, and internalizing problems) at low (-1 SD) and high (+1 SD) levels of home- or school-based aggression were plotted. Either home-based aggression or school-based aggression could serve as the moderator for each analysis. When interactions between home- and school-based aggression emerged, we compared the strength of associations between home-based aggression and adjustment outcomes at low levels of school-based aggression against the strength of associations between school-based aggression and adjustment outcomes at low levels of home-based aggression in order to detect whether aggression that occurred primarily in one setting was associated with the outcome of interest.

Next, polynomial regressions with response surface analyses (PR + RSA; Edwards, 2002; Laird & De Los Reyes, 2013; Shanock et al., 2010) were used to

examine whether convergences and divergences between home- and school-based aggression predicted adjustment outcomes in childhood and early adolescence. Response surface analysis allows for a clear visual interpretation of polynomial regression analyses that is not apparent with traditional methods of investigating significant interactions. Analyses included factor scores for home- and school-based aggression in childhood rather than latent variables to facilitate the response surface analyses (Edwards, 2002; Shanock et al., 2010). Earlier levels of the outcome variable (centered) and demographic variables (when correlated with both predictors and outcomes) were entered on step 1; the home-based aggression factor score was entered on step 2; and the school-based aggression factor score, quadratic factor scores for home- and school-based aggression, and the interaction between the home and school factors were entered on step 3 (Edwards, 2002; Parker et al., 2016).

The unstandardized beta coefficients for home aggression (b_1), school aggression (b_2), home aggression squared (b_3), the interaction between home and school aggression (b_4), and school aggression squared (b_5) were used to calculate four surface test values: a_1, a_2, a_3, and a_4. The slope of the line of agreement (a_1) equaled $b_1 + b_2$, and the curvature of this line (a_2) equaled $b_3 + b_4 + b_5$. The slope of the line of agreement shows whether home-school agreement at higher levels of aggression has different outcomes than agreement at lower levels of aggression; the curvature of the line of agreement indicates whether this relationship is curvilinear, or, whether matches at extreme values of home and school aggression have different outcomes than at less extreme values (Barranti et al., 2017; Shanock et al., 2010). Next, the slope of the line of incongruence (a_3) was calculated by subtracting $b_2 - b_1$, revealing whether the direction of the

discrepancy between home and school aggression was related to the outcome. Finally, the curvature of the line of incongruence (a_4) equaled $b_3 - b_4 + b_5$. Significant curvature of this line indicates whether the degree of divergence between levels of home and school aggression is related to the outcome. The significance of these four values and the three-dimensional plots were created using formulas (Edwards, 2002) and an Excel spreadsheet created by Shanock et al. (2010).

IV. RESULTS

Preliminary Analyses

Table 2 presents the correlations, means, and standard deviations for latent home and school aggression variables, and demographic, control, and outcome variables. Table 3 provides correlations, means, and standard deviations for mother, father, teacher, and peer reports of aggression from kindergarten through second grade. In general, mother and father reports were more strongly correlated with each other (*r*s = .40 - .57) than with teacher reports (*r*s = .24 - .29, .21 - .32, respectively) or peer reports (*r*s = .17 - .27, .23 - .27, respectively). Similarly, peer and teacher reports of aggression were more strongly correlated with each other (*r*s = .54 - .58) than with either mother or father reports. Table 4 presents the correlations, means, and standard deviations for mother and teacher reports of aggression in early adolescence.

To create the latent variable representing childhood aggression in the home, the measurement model included covariances among mother reports for each year and covariances among father reports for each year. The model fit was acceptable (χ^2 = 26.62, *df* = 4, *p* <.001; RMSEA = .10, *p* = .01; CFI = .98; TLI = .93), though modification indices suggested covarying mother and father reports in kindergarten to improve the fit. This final model fit the data well (χ^2 = 10.13, *df* = 3, *p* = .02; RMSEA = .06, *p* = .24; CFI = .99; TLI = .97) and was retained for all subsequent analyses.

The measurement model for the latent variable representing childhood school aggression initially included covariances among teacher reports for each year and covariances among peer reports for each year (χ^2 = 24.76, *df* = 4, *p* <.001; RMSEA = .10,

p = .02; CFI = .98; TLI = .94); however, the modification indices suggested allowing peer and teacher reports in second grade to covary. This adjustment improved model fit, and the model was retained for all subsequent analyses (χ^2 = 7.06, df = 3, p = .07; RMSEA = .05, p = .45; CFI = .99; TLI = .98).

The latent variable representing home-based aggression in early adolescence was comprised of mother reports from sixth, seventh, and eighth grade; the model was fully saturated, and all factor loadings were significant (factor loadings ranged from .80 - .92). Likewise, the latent variable representing school-based aggression in early adolescence used teacher-reports from sixth, seventh, and eighth grade; the model was fully saturated, and all factor loadings were significant (factor loadings ranged from .68 -.78).

The latent variable representing childhood aggression at home was significantly correlated with SES (r = -.18, p < .001) and race (r = -.17, p < .001), but not gender. That is, lower SES and Black or other minority race were associated with higher levels of aggression at home. The latent variable representing childhood aggression at school was significantly associated with SES (r = -.20, p < .001) and gender (r = -.28, p < .001), but not race. That is, higher levels of aggression at school were associated with lower SES and male gender.

The latent variable representing childhood aggression at home was not significantly related to academic achievement in kindergarten, third, or ninth grade. Childhood aggression at school was similarly not significantly associated with academic achievement in kindergarten, third, or ninth grade. Academic achievement in kindergarten, third, and ninth grade was significantly related to all demographic variables

(age, gender, race), such that being Black, male, and from lower SES were all associated with lower academic achievement.

As for peer adjustment, home-based aggression in childhood was significantly associated with lower social preference in kindergarten (r = -.12, p = .005), but unrelated to peer adjustment in third or ninth grade. School-based aggression in childhood was significantly related to social preference in kindergarten (r = -.38, p < .001) and third grade (r = -.08, p = .02) such that higher levels of aggression at school were related to lower social preference scores in kindergarten, and fewer peer adjustment problems in third grade. Peer adjustment in ninth grade was not significantly correlated with any of the demographic variables. Peer adjustment in third grade was only significantly correlated with SES (r = .11, p = .02), such that higher SES was associated with greater peer adjustment. Finally, social preference in kindergarten was significantly associated with both gender (r = .16, p < .001) and SES (r = .14, p = .002), such that higher social preference scores were related to being female and from higher SES families.

Home-based aggression in childhood was significantly related to mother-reported internalizing problems only in kindergarten (r = .40, p < .001), such that more home-based aggression was related to more mother-reported internalizing problems in kindergarten. School-based aggression in childhood was not significantly related to any of the measures of internalizing problems. Internalizing problems in ninth grade were significantly correlated only with sex, such that girls reported higher levels of internalizing problems (r = .19, p < .001).

Convergence and Divergence Across Contexts (Aim 1)

Consistent with hypotheses, the correlation between the home-based aggression and school-based aggression latent variables in childhood was moderate (r =.42, p < .001). In early adolescence, the correlation between the home-based aggression and school-based aggression latent variables was similarly moderate (r = .47, p < .001).

For the latent profile analysis, up to five profiles were fit to the data (see Table 5 for fit statistics). Although the lowest AIC and BIC were shown for the five-profile model, the significant adjusted LRT and higher entropy favored the four-profile solution. In addition, upon further examination, two of the five profiles were quite small (less than 7% of the sample), suggesting inadequate proportions of each profile type. Thus, given the fit statistics in combination with empirical support from existing studies (e.g., Fergusson et al., 2009; Sulik et al., 2017), the four-profile model was chosen as the final model. The four groups that emerged were: low aggression across contexts, high aggression across contexts, high aggression at school only, and high aggression at home only. The largest group displayed low aggression across contexts (52.9%), followed by aggression primarily displayed at home (25.7%). Nearly 13% of children displayed aggression primarily at school, and only 8.6% displayed high levels of aggression at both home and school.

Cross-Contextual Prediction of Aggression (Aim 2)

Results of the cross-lagged panel analysis revealed socioeconomic status (B = -.08, SE = .02, p < .001) and race (B = 3.87, SE = 1.05, p < .001) each significantly predicted school-based aggression in adolescence. None of the demographic control variables significantly predicted home-based aggression. Consistent with hypotheses, home-based aggression in childhood significantly predicted home-based aggression in

adolescence (B = 1.01, SE = .12, p < .001), and school-based aggression in childhood significantly predicted school-based aggression in adolescence (B = .76, SE = .12, p < .001). Contrary to hypotheses, however, home-based aggression in childhood did not predict later school-based aggression, and school-based aggression in childhood did not significantly predict later home-based aggression, after controlling for earlier levels of aggression at home and school (see Figure 1). The model fit was acceptable (χ^2 = 364.26, df = 138, p < .001; RMSEA = .05, p = .18, CFI = .95, TLI = .93).

Unique Associations and Outcomes of Context-Specific Aggression (Aim 3)

Predicting Academic Achievement

Academic Achievement in Third Grade. Academic achievement in kindergarten (B = .95, SE = .11, p < .001), gender (B = .42, SE = .15, p < .01), race (B = -.67, SE = .21, p = .001) and SES (B = .03, SE = .01, p < .001) all significantly predicted academic achievement in third grade, such that higher grades in kindergarten and higher SES were associated with higher academic achievement in third grade. Academic achievement was also higher for girls and white children. Contrary to hypotheses, neither home-based aggression (B = -.06, SE = .04, p = .17) nor school-based aggression (B = -.00, SE = .03, p = .89) independently predicted academic achievement in third grade. The interaction between home- and school-based aggression predicted academic achievement at the non-significant trend level (B = .03, SE = .02, p = .07).

The interaction between home- and school-based aggression was plotted and interpreted with home-based aggression serving as the moderator and again with school-based aggression as the moderator of the relationship between academic achievement in third grade and aggression in the other context. Hypotheses concerning the interaction

between home and school aggression were partially supported. School-based aggression was significantly and negatively associated with academic achievement in third grade when home-based aggression was low (B = -.06; SE = .03; p = .004) but not when home-based aggression was high (B = .02; SE = .02; p = .55). Likewise, the slope of the association between home-based aggression and academic achievement in third grade was significant at low levels of school-based aggression (B = -.12; SE = .03; p < .001) but not at high levels (B = .02; SE = .03; p = .49). These results should be interpreted with caution, however, as the initial interaction was a nonsignificant trend (see Figures 2 and 3).

Polynomial regression analyses were repeated using factor scores for childhood home- and school-based aggression to allow subsequent response surface analyses. Results mirrored the analyses using latent variables: academic achievement in kindergarten (B = .98, SE = .11, p < .001), gender (B = .40, SE = .15, p < .01), race (B = -.65, SE = .20, p < .01), and SES (B = .03, SE = .01, p < .001) each predicted academic achievement in third grade. However, in analyses with factor scores, the interaction between home and school aggression significantly (rather than marginally) predicted academic achievement (B = .01 SE = .01, p = .03). Contrary to hypotheses, response surface analyses revealed a significant and negative a_4 value (B = -.03, SE = .01, p = .04), suggesting that academic achievement in third grade was lower as levels of aggression at home and at school deviated from each other (see Figure 4a). Given the lack of a significant a_3 value, it appeared that it was equally problematic if aggression was higher either at home or at school, consistent with the interaction results reported above. No other test values were significant (see Table 6).

Academic Achievement in Ninth Grade. Race (*B* = -.86, *SE* = .22, *p* < .001), SES (*B* = .02, *SE* = .01, *p* < .001), and academic achievement in kindergarten (*B* = .70, *SE* = .12, *p* < .001) were significant predictors of academic achievement in ninth grade, such that higher SES and higher grades in kindergarten were associated with higher academic achievement in ninth grade, as was being white. Consistent with hypotheses, school-based aggression in childhood (*B* = -.05, *SE* = .03, *p* = .03) predicted later academic achievement, as did home-based aggression (*B* = -.07, *SE* = .04, *p* = .04), such that higher levels of aggression in childhood at school and at home predicted lower academic achievement in ninth grade. In contrast with expectations, however, the interaction between home and school aggression in childhood was not a significant predictor of academic achievement in ninth grade.

Polynomial regression analyses with factor scores revealed similar results when predicting academic achievement in ninth grade: race (*B* = -.80, *SE* = .20, *p* < .001), SES (*B* = .03, *SE* = .01, *p* < .001), achievement in kindergarten (*B* = .71, *SE* = .12, *p* < .001), school-based aggression (*B* = -.06, *SE* = .03, *p* = .02), and home-based aggression (*B* = -.08, *SE* = .03, *p* = .02) predicted academic achievement. When using factor scores, gender was also a significant predictor of academic achievement in ninth grade (*B* = .32, *SE* = .15, *p* = .03), such that girls had higher academic achievement than boys. In partial contrast to expectations (that school-based aggression would be more problematic than home-based aggression), response surface analyses revealed only a significant and negative slope along the line of agreement (*B* = -.13, *SE* = .04, *p* = .001), suggesting that when levels of aggression at home and at school were similarly high, academic

achievement in ninth grade was lower (see Figure 4b). No other test values were significant.

Predicting Peer Adjustment

Peer Adjustment in Third Grade. In contrast with expectations, peer adjustment in third grade was not predicted by either home- or school-based aggression in childhood. Polynomial regression analyses using factor scores likewise did not reveal any significant predictors of peer adjustment in third grade. Response surface analyses did not indicate any significant test values for the relationship between home and school aggression and peer adjustment.

Peer Adjustment in Ninth Grade. Social preference in kindergarten (B = -.40, SE = .14, p = .004) significantly predicted peer adjustment in ninth grade, such that lower social preference scores were associated with worse peer adjustment in early adolescence. Social preference in kindergarten accounted for 4% of the variance in peer adjustment in ninth grade. In partial support of hypotheses, only home-based aggression in childhood independently predicted later peer adjustment (B = .14, SE = .05, p = .02) and accounted for 2% of the variance. That is, more aggression at home predicted worse peer adjustment in ninth grade. School-based aggression and the interaction between home and school-based aggression were not significant.

Polynomial regression analyses using factor scores revealed similar results. Social preference in kindergarten (B = -.42, SE = .13, p = .001) and home-based aggression in childhood (B = .13, SE = .05, p = .009) significantly predicted peer adjustment in ninth grade. Consistent with hypotheses, response surface analyses indicated a significant and positive slope along the line of agreement (B = .15, SE = .06, p = .02), suggesting more

peer adjustment difficulties when aggression at home and at school match at higher levels than at lower levels (see Figure 4c). No other test values were significant.

Predicting Internalizing Problems

Gender significantly predicted internalizing problems in ninth grade (B = 2.87, SE = .85, p = .001), while teacher reported aggression in childhood predicted internalizing problems at a non-significant trend level (B = .14, SE = .08, p = .09). Control variables accounted for 7% of the variance in internalizing problems in ninth grade. Home-based aggression in childhood predicted internalizing problems at a non-significant trend level at step of entry (B = .19, SE = .11, p = .09), but was not significant in the full model (B = .18, SE = .14, p = .20). Contrary to expectations, school-based aggression in childhood did not independently predict later internalizing problems in analyses utilizing latent variables (see Table 7). Home- and school-based aggression together accounted for 2% of the variance in later internalizing problems.

Polynomial regression analyses using factor scores revealed somewhat different results. Gender remained a significant predictor (B = 2.86, SE = .77, p < .001), while both mother reports (B = .18, SE = .08, p = .02) and teacher reports of internalizing problems in kindergarten (B = .16, SE = .07, p = .03) emerged as significant predictors of later internalizing problems. Additionally, home-based aggression in childhood was a significant predictor at the step of entry (B = .34, SE = .16, p = .03), but in the full model predicted internalizing problems in ninth grade only at a nonsignificant trend level (B = .34, SE = .18, p = .06). Consistent with hypotheses, response surface analyses revealed a positive slope along the line of agreement (B = .39, SE = .22, p = .08) at the nonsignificant trend level, suggesting that internalizing problems were greater when

levels of home and school aggression matched at higher levels than at lower levels (see Figure 4d).

V. DISCUSSION

Aggression, as conceptualized in the current study, encompasses a broad variety of disruptive and hurtful behaviors including threatening or fighting, argumentativeness, teasing, and talking back (Achenbach, 1991; Dodge et al., 2006). These types of behaviors tend to be problematic across settings, but whether aggressive behavior at home or at school predicts later aggression in the other context is less clear. Additionally, questions remain as to whether aggression that occurs primarily at home or at school has unique effects both concurrently in childhood and longitudinally through early adolescence. Thus, the current study examined the relation between aggression at home and school, the unique effects of aggression at home and school, and the outcomes of context-specific aggression (i.e., aggression that occurs primarily in one context) with a multi-informant, longitudinal design, including reports of aggression from home (mothers, fathers) and school (teachers, peers) as well as objective and self-reported outcome variables.

Consistent with hypotheses, aggressive behavior in the home context and aggressive behavior in the school context were moderately related. In addition, based on the results of the latent profile analysis, support emerged for the hypothesis that many children would display elevated aggression primarily in one context. About 40% of children displayed aggression primarily at home or at school. In contrast to hypotheses, analyses revealed within-context stability of aggression but not cross-context prediction. More specifically, early aggression at home predicted later aggression at home, but not at school, and early aggression at school predicted later aggression at school, but not at

home, after controlling for the effects of earlier aggression at home and school as well as gender, race, and SES.

Of particular interest were the unique effects of aggression at home and at school. In partial contrast with hypotheses, results revealed no independent effects of home- or school-based aggression on academic achievement in third grade, but discrepancies between the two contexts were significant, as academic achievement was lower as the levels of aggression at home and at school became increasingly discrepant from one another. In ninth grade, a different pattern emerged with both home- and school-based aggression independently predicting later academic achievement; levels of academic achievement were lower when aggression in both contexts was elevated. Interestingly, neither home- nor school-based aggression predicted peer adjustment in third grade, and only home-based aggression predicted self-reported peer adjustment in early adolescence. Finally, gender was the strongest predictor of later internalizing problems, with no apparent independent effect of aggression at school. Evidence for the association between home-based aggression in childhood and internalizing problems in early adolescence was mixed: Home-based aggression predicted internalizing problems in response surface analyses with factor scores, but not in the analyses with latent variables.

In summary, home-based aggression and school-based aggression were moderately related, commonly occurred in one context more than the other context, did not predict cross-context aggression when controlling for within-context stability, and predicted psychosocial outcomes differently. These results suggest that research should focus on the context of aggression and explore the risk factors and outcomes of context-specific aggression.

Convergence and Divergence Across Contexts (Aim 1)

Correlational analyses supported the hypothesis that aggressive behavior at home and at school during the elementary school years would be moderately related (r = .42). Within each context (i.e., between mothers and fathers and between teachers and peers) correlations were higher and moderate in magnitude. The lowest correlations were seen between informants across contexts. Mother reports of aggression were moderately correlated with teacher and peer reports, while correlations between father reports and teacher and peer reports were low.

These findings align with a large body of research across ages and cultural contexts asserting that reporters in the same context tend to have higher correspondence than reporters in different contexts (e.g., Achenbach, 1987, 2011). For instance, according to a large-scale meta-analysis conducted by De Los Reyes and colleagues (2015), the average correlation between mother and father reports for externalizing behaviors is .58, while the average correlation for parent and teacher reports is .28. Some overlap across contexts is apparent because aggression is partially trait-like (e.g., van Beijsterveldt et al., 2003); however, results of the present study demonstrate that child aggression is also partially context-specific during the elementary years. Capturing the shared variance across multiple reporters in each context provided a better estimate of aggression within context and therefore a better estimate of cross-context convergence and divergence.

Given only moderate overlap in aggression across contexts, aggression is likely driven, in part, by processes that are unique to each setting. For example, aggression that occurs primarily at school may be due to difficulty with peer and teacher relationships

(Bierman, 2004) or used to attain higher social status and popularity (e.g., Mayeux & Kraft, 2018; Vaillancourt & Hymel, 2006). Aggression that occurs primarily at home, on the other hand, may stem from harsh or controlling parent-child interactions (e.g., McFadyen-Ketchum et al., 1996; Shaw et al., 2001) or the presence of siblings – a common source of aggressive behavior as reported by parents (Feinberg et al., 2012).

The results of a person-oriented latent profile analysis corroborated the variable-oriented analyses, reinforcing the notion that a substantial percentage of children exhibit different levels of aggression in the home and school contexts. More specifically, while most participants showed low levels of aggression across contexts (53%), a larger percentage of participants displayed higher levels of aggression at home (26%) than at school (13%). Additionally, only a small percentage (9%) displayed elevated levels of aggression both at home and at school, consistent with the percentage of children diagnosed with severe impairment due to clinical behavior disorders (Merikangas et al., 2010).

Patterns of contextualized aggression revealed in the current study mapped on to prior studies of context-specific behavior, with a four-class solution being the best fit. This four-group solution and the percentages in each group were similar to a recent study conducted by Sulik and colleagues (2017). In this study utilizing a comparable sample of five- to seven-year-old children, similar proportions were noted, with 54% in the low cross-context class, 27% in the home context, and 12% in the school context. Although a recent study (Curhan et al., 2020) found that a three-group solution was the best fit in their middle school sample, the group sizes are likewise similar to those in the current study. More specifically, 63% of participants were in the low symptom agreement group,

20% in the caregiver high externalizing, and 17% in the teacher high externalizing group. Thus, it appears quite common for children to display elevated aggression in one setting but not another. Furthermore, prior studies considered together with the enhanced assessment of context in the present study suggest that displaying aggression primarily at home is more prevalent than displaying aggression primarily at school.

Although the current study did not directly investigate potential causes of discrepant behavior across contexts, prior research offers some plausible explanations as to why it was more common for children to display aggression primarily at home rather than primarily at school. First, as children enter formal school the role of the peer group intensifies and fitting in becomes more important. Research suggests that popularity and social status, though generally considered more salient in adolescence, have their origins in elementary school peer groups (Adler et al., 1992). Children may be keenly aware that at least some forms of aggression at school can interfere with their ability to make friends and fit in. Thus, children may inhibit aggression at school to avoid peer repercussions but feel less motivated to regulate strong emotions and behaviors at home (Goldsmith et al., 1991; Rydell et al., 2003).

The presence of siblings in the home may also contribute to higher levels of aggression in the home context compared to the school context. Most households have more than one child, and physical altercations between siblings are quite common: nearly 70% of parents report physical aggression amongst their children (Feinberg et al., 2012). Sibling conflict is a common source of parental stress and arguments between parents and adolescents (Feinberg et al., 2012). Thus, the prevalence of sibling physical and verbal

aggression, coupled with the ensuing parental stress of managing these altercations, is a likely explanation for higher levels of aggression at home than school.

Taken together, these results emphasize the importance of considering multiple informants within each setting to capture aggression-in-context and point to the need for greater understanding of specific aspects of each environment that may contribute to elevated levels of aggression for some children.

Cross-Contextual Prediction of Aggression (Aim 2)

The second aim was to investigate whether aggressive behavior at home or at school in childhood predicts aggression in the other context in early adolescence. Strong support emerged for stability of context-specific aggression, such that early aggression in one setting strongly predicted later aggression in the same setting. Although aggression was related across contexts, aggression in one context did not predict aggression in the other context beyond within-context stability. A related study by Sulik and colleagues (2017) based on latent profiles of aggression found that context-specific aggression was highly stable over time. That is, aggressive children were more likely to remain aggressive in the same setting, or to display less aggression over time than to become aggressive in a different setting. The current study corroborates this finding, suggesting that aggression is stable within context but does not necessarily spill over to other settings. Importantly, overall levels of aggression in the present study were low and thus the stability of low or no aggression is also apparent.

Across and within contexts, some stability over time is likely attributable to genetic contributions, which account for about half of the stability in aggression (e.g., van Beijsterveldt et al., 2003). Within-context stability specifically, on the other hand, may be

attributable to a variety of environmental factors, including reciprocal processes like conflict and negative reinforcement in the home context and teacher expectancies, self-fulfilling prophecies, and the salience of social goals in the school context. Each context also provides some stability regarding behavioral norms and expectations, contingencies for prosocial and aggressive behaviors, and demands for emotion regulation (Harris, 1995).

Stability in the home environment is likely due in large part to parent-child relationships and interaction patterns that reinforce and maintain the level of aggression (or prosocial behavior) in the home. Connections between hostile parent-child interactions and the developmental progression of aggression (e.g., McFadyen-Ketchum et al., 1996; Shaw et al., 2001) may reflect patterns of coercion and negative reinforcement (Dishion & Patterson, 2006; Patterson, 1982). For example, a child's noncompliance may be met with parental anger and hostility, to which the child then responds with increased aggression until the parent gives in, reinforcing aggression as a viable form of conflict resolution (Bank et al., 1996). On the other hand, permissive parents may unintentionally reinforce their child's problematic behavior by giving in and relenting when faced with aggressive or power-assertive interactions (Ehrenreich et al., 2014; Hosokawa & Katsura, 2019).

The presence of siblings may also contribute to the relative stability of aggression in the home, as most children live with at least one sibling (Feinberg et al., 2012). Sibling conflict is quite common, and in fact, aggression between siblings is one of the most common forms of family violence (Straus, 1980/2006). Tremblay and colleagues (2004) discovered that having a sibling at home was the largest risk factor for membership in the

"high-aggression" group, increasing odds of membership by four. Thus, the mere presence of siblings in the home can provide a stable and long-term source of conflict through childhood until its peak in early adolescence (Campione-Barr, 2017; Kim et al., 2006).

Context-specific interpersonal processes also sustain aggression in the school context. For example, expectations and reputational biases on the part of both teachers and peers may maintain aggression (or non-aggression) at school (Jussim & Harber, 2005). Teacher expectations and perceptions can influence not only the child's self-perception, but also the perception of their peers (Barnett, 2018; Hughes et al., 2001). A kindergartner with disruptive behaviors may elicit negative responses and increased reprimands from the teacher; in turn, peers may alter their own perceptions and level of interaction with the child (Harris et al., 1992; McKown et al., 2010). Aggressive children that are rejected by their peers and consistently treated sternly by their teachers receive fewer opportunities for positive and prosocial interactions upon which to improve their status and social competence (Bierman, 2004). These interactions may elicit the expected aggressive behaviors, leading to a self-fulfilling prophecy and stability in problematic behaviors over time.

Another possible explanation for the stability of school-based aggression is that aggression can be used to achieve social goals unique to the school or /peer context, such as popularity or power. For instance, Vaillancourt & Hymel (2006) found that aggression was likely to persist if one's peers viewed them as popular and powerful. More specifically, this study revealed that aggression in combination with peer-valued characteristics such as attractiveness or athleticism was *positively* associated with social

status. Moreover, agentic goals such as achieving power or status have been implicated in the positive associations between popularity, overt aggression, and prosocial skills (Mayeux & Kraft, 2018).

The strong stability of aggression across time may underlie assumptions that aggression must also spread across contexts. However, in contrast to expectations and common assumptions in the field, home-based aggression in childhood did not predict school-based aggression in early adolescence beyond the stability of school-based aggression, and school-based aggression in childhood did not predicted home-based aggression in early adolescence beyond the stability of home-based aggression. These results emphasize the value not only of including reporters from different settings when predicting developmental outcomes, but also of examining reporters separately by context rather than averaging or creating a composite, to detect the nuanced effects of aggression at home and at school.

The absence of cross-context prediction also suggests that aggressive behaviors in each setting are, at least in part, responses to context-specific conditions or serve context-specific functions. That is, if aggression serves to achieve or maintain social goals at school that do not apply in the home environment (e.g., reputation management, popularity), then behaviors may persist over time in the school context without appearing in the home (Harris, 1995). Moreover, the long-term and obligatory nature of family relationships may reflect deeply entrenched patterns of aggression that do not carry over to the school context where relationships with peers tend to be voluntary, and new opportunities for friendship arise each school year (Furman, 1999). According to Group Socialization Theory, patterns of interaction need not carry over from one context to the

next, particularly if they are not found to serve a purpose outside of the home or in the classroom (Harris, 1995).

The somewhat unexpected finding that aggression in one context did not predict later aggression in another context emphasizes the need to better understand more about what aspects of each environment may be eliciting aggressive behaviors. Additionally, this finding is a starting point for identifying outcomes that may be uniquely associated with trajectories of context-specific aggression at home or at school. If the level of aggression in either context is deemed problematic, interventions would likely need to be tailored to address the distinct environmental triggers present in the home or at school.

Unique Associations and Outcomes of Context-Specific Aggression (Aim 3)

After establishing the relatively stable nature of aggression in each context, the next step was to identify the unique effects of aggression at home and at school. Results revealed that as levels of aggression between contexts became increasingly discrepant, regardless of whether aggression was higher at school or at home, academic achievement in third grade was lower. A different pattern emerged for academic achievement in ninth grade as both home- and school-based aggression independently predicted poorer academic achievement. Moreover, academic achievement in ninth grade decreased as levels of aggression across contexts matched at higher levels. Contrary to hypotheses, school-based aggression did not significantly predict self-reported peer adjustment or internalizing problems in early adolescence. While analyses utilizing latent variables did not indicate a significant effect of home-based aggression on later internalizing problems, supplemental analyses using factor scores revealed that home-based aggression

independently predicted internalizing problems. These mixed findings merit further investigation.

Predicting Academic Achievement

The strongest predictor of academic achievement in both third and ninth grade was academic achievement in kindergarten. This was not surprising, given that the best predictor of academic achievement is earlier levels of achievement (Duncan et al., 2007). SES was also a significant and consistent predictor of academic achievement over time. Taken together, the control variables accounted for 39% of the variance in academic achievement in third grade, and 35% of the variance in academic achievement in ninth grade. The addition of home- and school-based aggression accounted for an additional 1% of the variance in academic achievement in third grade, and an additional 3% of the variance in ninth grade academic achievement. While small, these effects are still noteworthy given the conservative nature of the analyses in this study. Interestingly, different patterns of context effects emerged when predicting third and ninth grade academic achievement.

In third grade, the interaction effect between home- and school-based aggression and the response surface result of a discrepancy effect suggest that context-specific aggression at home or at school predicts poorer academic achievement. The interaction effect showed that the negative relationship between school-based aggression and academic achievement in third grade was stronger when home-based aggression was low as compared to when home-based aggression was high. Likewise, the negative relationship between home-based aggression and academic achievement was stronger when school-based aggression was low as compared to when school-based aggression

was high (see Figures 2 and 3). Supporting this result was the significantly concave response surface value which indicated that as levels of aggression at home and at school grew increasingly discrepant from each other, academic achievement decreased. Taken together, the interaction and the significant curvature of the line of incongruence suggest that academic achievement in third grade suffers when children display elevated levels of aggression in one context, whether at home or at school.

Importantly, school- and home-based aggression were measured from kindergarten through second grade, a time period that captured the transition to formal schooling. Aggression can often be traced to low self-regulatory skills, and aggression in the classroom may be indicative of difficulty adjusting to classroom expectations. Demands of the elementary school classroom often differ from those in the home environment and for some children, high emotionality and underdeveloped regulatory abilities may interfere with the need for sustained attention and adherence to more rigid rules and directions in the classroom (Allan et al., 2014; Blair, 2002). It is possible that higher levels of aggression at school compared to home may be particularly problematic for academic outcomes because this pattern represents a specific difficulty with transitioning to and functioning in the school context.

Alternatively, when aggression is similar across settings, and parents and school personnel agree on problematic behaviors, children may be more likely to receive formal and informal academic and behavioral support (De Los Reyes et al., 2015). Thus, despite the possible risks of more pervasive behavior problems, discrepancies in aggression across contexts may predict worse academic outcomes than cross-context aggression if

discrepant behavioral patterns and perspectives of parents and teachers preclude needed services and support.

In ninth grade both home- and school-based aggression independently predicted academic achievement. In addition, response surface analysis revealed lower levels of academic achievement when home and school aggression matched at higher levels than at lower levels. The finding that school-based aggression predicts later achievement is consistent with a large body of research that has documented the adverse academic outcomes associated with engaging in difficult, disruptive, and aggressive behavior in the classroom (e.g., Hinshaw, 1992; Zimmerman et al., 2013).

Aggression at school is problematic because it disrupts instructional time (Breslau et al., 2011; Moilanen et al., 2010), causing aggressive children to spend more time outside of the classroom (Bierman et al., 2013). Indirectly, aggression at school can also diminish the quality of teacher and peer relationships, both of which predict standardized test scores and classroom adjustment (Stipek & Miles, 2008; Miles & Stipek, 2006). In turn, aggressive children may find themselves less connected to school (Hosan & Hoglund, 2017), less motivated to do well (Connell & Wellborn, 1991), and less likely to engage in the classroom (Cadima et al., 2015) which could lead to lower grades both concurrently and over time. At home, aggressive behavior may reflect persistent parent-child difficulties that undermine parental support for academics and increase general stress levels. Indeed, maternal intrusiveness and supportiveness are both related to later academic achievement, with more intrusiveness and less supportiveness linked with lower academic achievement (Liew et al., 2018).

In contrast to prediction of academic achievement in third grade, response surface results suggested that agreement on high levels of aggression across contexts predicted poorer academic achievement in ninth grade. Cross-contextual aggression in childhood may indicate a more severe or perhaps clinically significant behavior problem or a common antecedent, such as cognitive deficits, that predicts both aggression and academic difficulties (Kulkarni et al., 2020). Taken together, these results suggest that aggression in either setting predicts more negative academic outcomes as children age, and that aggression across settings is particularly problematic for academic achievement in ninth grade. Thus, it is important to identify children who have difficulty with aggressive behavior in either setting in elementary school. Interventions may be necessary to prevent later academic difficulties, even if aggression is not apparent in the school setting.

Predicting Peer Adjustment

Self-reported peer adjustment in third grade was not predicted by home- or school-based aggression. This is somewhat surprising given the large body of research documenting links between aggression and quality of peer relationships in school-aged children (e.g., Crick, 1996; Rubin et al., 1998). One possible explanation is that aggressive children are more likely to inaccurately rate the quality of their peer relationships (e.g., Hughes et al., 1997; McQuade et al., 2014; David & Kistner, 2000; Sandstrom & Herlan, 2007), particularly in elementary school as compared to early adolescence (Salley et al., 2010). Thus, inflated self-perceptions of quality of peer relationships may counterbalance the actual peer problems of aggressive children, resulting in no effect on self-reported quality of peer relationships. Although the current

study utilized child self-report to avoid either parents or teachers reporting and confounding context effects, researchers should consider including a measure of teacher or parent reported social acceptance or a multi-informant composite that includes parent, teacher, and peer reports to control for biased perceptions of peer relationship quality.

Both social preference in kindergarten and home-based aggression in childhood significantly predicted self-reported peer adjustment in ninth grade. At home, parents fulfill specific socialization functions that can be disrupted by aggressive child behavior (Grusec, 2019). When children are aggressive, parents may focus on behavioral control at the expense of other socialization roles such as protection when distressed and social and cognitive guidance (Grusec, 2019; Grusec & Davidov, 2010; Hastings & Rubin, 1999). A disproportionate focus on behavioral control or hostile parent-child interactions may in turn undermine the development of appropriate emotion regulation and social skills. Difficulties with emotional regulation or social skills may reduce opportunities for positive social interactions with peers, possibly leading to subsequent peer rejection, victimization, and later social problems (Leadbeater & Hoglund, 2009).

On the other hand, some aggression at school may be proactive and effective, and therefore not predictive of self-reported peer maladjustment (e.g., Mayeux & Kraft, 2018; Vaillancourt & Hymel, 2006). For instance, agentic goals such as achieving power or status have been implicated in the positive associations between popularity and overt aggression (Mayeux & Kraft, 2018).

It was somewhat surprising that school-based aggression in childhood did not predict later social problems, as most peer interactions take place at school and tend to set the foundation for future social interactions (Dishion & Tipsord, 2011). However,

response surface analyses revealed a significant slope of the line of agreement, indicating that while school-based aggression alone did not significantly predict later peer adjustment, congruence in level of aggression across contexts did. That is, when aggression at home and school matched at higher levels, peer adjustment was lower than when aggression at home and school matched at lower levels of aggression. This finding suggests that aggression in multiple settings compromises peer adjustment in early adolescence. Cross-context aggression is likely an indicator of social behaviors that do not effectively meet or maintain goals in either context and perhaps indicates more severe emotional dysregulation, leading to peer rejection.

Predicting Internalizing Problems

Contrary to hypotheses, in latent variable models, neither home- nor school-based aggression in childhood significantly predicted self-reported internalizing problems in ninth grade, controlling for earlier levels of mother and teacher reported internalizing behaviors in kindergarten. This result is inconsistent with previous research which found that children rated by their mothers as displaying “moderately stable” and “high stable” levels of aggression from ages 2 to 9 later self-reported more depressive symptoms than children with little to no aggression as early adolescents (Campbell et al., 2006). Likewise, a recent study from Evans and colleagues (2020) reported that children with elevated levels of any subtype of aggression reported more depressive symptoms than children with low levels of aggression. Gender, on the other hand, was a strong predictor of internalizing problems in ninth grade, consistent with prior research (e.g., Kessler et al., 1994).

In contrast to latent variable models, response surface analyses with factor scores were consistent with hypotheses in that home-based aggression in childhood predicted internalizing problems in early adolescence. The bidirectional nature of aggressive behavior between parents and children underlies several pathways through which child aggression at home may lead to internalizing problems in adolescence. Aggressive behavior in the home context is associated with changes in parenting practices and in turn with the quality of the parent-child relationship (Reitz et al., 2006). Difficult behaviors can contribute to increased rates of hostile parenting (e.g., MacKenzie et al., 2015; Stormshak et al., 2000), less instances of positive parenting (Besnard et al., 2013), and increased lax and inconsistent parenting (Reitz et al., 2006). Results from a large cross-cultural study indicate that child externalizing problems seem to influence parenting behaviors negatively such that parents show less warmth and more control over time (Lansford et al., 2018). In turn, numerous studies have shown that low parental warmth and sensitivity, as well as harsh and inconsistent parenting, increase risk for developing depressive symptoms and other internalizing problems (e.g., Bayer et al., 2006). Moreover, having a parent who attempts to address aggressive behavior via coercive control or manipulation, or who fails to provide emotional guidance around feelings of frustration or anger, can lead to more withdrawn and depressed behaviors (e.g., Saltalı & İmir, 2018). Importantly, results concerning the effect of early home-based aggression on later internalizing problems differed across analyses and therefore should be interpreted with caution.

Response surface analyses also indicated a positive slope along the line of agreement at a nonsignificant trend level, suggesting that internalizing problems were

greater when levels of home and school aggression matched at higher levels than at lower levels. That is, aggressive behavior across contexts marginally predicted internalizing problems in early adolescence. Thus, childhood aggression that occurs at school in addition to home may contribute to the development of internalizing problems.

At school, children who exhibit a broad pattern of aggressive behaviors tend to experience peer rejection and deviant peer affiliations (e.g., Vitaro et al., 2018; Vitaro et al., 2007). Peer rejection, in turn, can contribute to loneliness both concurrently and across the transition to middle school (Rotenberg, 2019), and both aggression at school and peer rejection have been linked to long-term mental health problems (Parker & Asher, 1987; Ryan & Shin, 2018).

Taken together, these results suggest that while cross-contextual aggression in childhood may be a risk factor for the development of internalizing problems in adolescence, aggression that is limited to only the home setting may also be problematic. Given that girls are particularly prone to internalizing problems in middle school, the consideration of forms and functions of aggression typically displayed by girls may provide more accurate predictions.

Limitations and Future Directions

The results of the current study offer important first steps toward understanding the unique effects of home- and school-based aggression as well as the outcomes of context-specific aggression. Strengths of the study include the examination of broadly defined aggression in its natural, continuous form, as well as the use of multiple informants both at home (mothers, fathers) and at school (teachers, peers) to capture context-specific variance. The large community sample and longitudinal design

strengthened the results of the study, and the use of polynomial regression with response surface analysis was an innovative approach to study context-specific aggressive behavior.

An important contribution of the current study was evidence from latent variable models and latent profile analysis that aggression is at least partially context-specific in elementary school, which supports the investigation of contexts of aggression in addition to informants of aggression. Methodologically, these results suggest that while reporters may be aware of a child's behavior in other contexts, they primarily report on behavior in the context they observe. Whereas multiple informants in each context allowed strong contextual assessment in childhood, a limitation of the present study is the use of single informants in each context in early adolescence. Ideally, future research could incorporate father and peer reports in adolescence to provide multiple informants for each context later in development. In the current study, early father reports of aggression were missing in many cases. Given that prior research is mixed on differences between mothers' and fathers' perceptions of externalizing behaviors in their children, this is a noteworthy limitation (e.g., Duhig et al., 2000; van der Veen-Mulders et al., 2017).

The interaction and discrepancy effects of aggression at home and at school on academic achievement in third grade, but not in ninth grade, highlight the early impact of context-specific aggression, whether the aggression occurs at home or at school; as such, identifying different predictors and outcomes based on developmental period may be a fruitful area of research. More broadly, next steps may include the consideration of potential setting-specific mediators that have been associated with both aggression and outcomes of interest, such as early parenting practices, teacher-child relationship quality,

and peer rejection or victimization to better understand the mechanisms by which childhood aggression at home or school specifically leads to academic, internalizing, and social problems in adolescence (Burke et al., 2002).

The significant relationship between childhood home-based aggression (and not school-based aggression) and later peer adjustment was another noteworthy result uncovered by the current study, with the implication that early aggression at school is less clearly linked with peer adjustment problems in adolescence. While the use of self-reported peer adjustment minimized common informant bias, aggressive children may have inaccurate self-perceptions (e.g., Hughes et al., 1997; David & Kistner, 2000; Sandstrom & Herlan, 2007). Future work in this area should include a measure of teacher or parent reported social acceptance or a multi-informant composite that includes parent, teacher, and peer reports in order to control for potentially biased perceptions of peer relationship quality. In addition, the measure used to indicate peer adjustment in third grade was not significantly correlated with social preference ratings in kindergarten but was significantly correlated both with earlier mother-reported internalizing as well as self-reported internalizing in ninth grade. Thus, this measure may be a better indicator of later internalizing problems than of peer adjustment. Alternative indicators of middle childhood peer adjustment should also be explored given that the Me and My Friends questionnaire has not been widely used and the validity and cross-time reliability are unclear.

Another important area for future consideration is the role of SES in context-specific aggression and associated outcomes. SES represents a host of stressful and chaotic life circumstances for both parents and children that may manifest in harsh

discipline, cognitive deficits, and socioemotional functioning (Conger & Donnellan, 2007). Consistent with the family stress model of economic hardship developed by Conger and Conger (2002), low SES may put children at risk for behavior problems via decreased warmth and involvement from parents who are preoccupied with difficulties stemming from increased economic pressure (Conger & Donnellan, 2007). Therefore, clarifying the role of SES in the development and progression of context-specific aggression would be a practical next step.

While the current study moved the literature forward in several ways, it was not without its limitations. First, our study did not differentiate between various forms and functions of aggression, instead relying on a broader measure of aggression, potentially overlooking associations between specific types of aggression and psychosocial outcomes. Teachers may be more attuned to physical aggression as it is observable and usually requires attention or intervention on behalf of the teacher, as compared to relational aggression, which could go relatively unnoticed by teachers (Evans et al., 2019). Peers, on the other hand, are likely attuned to a variety of forms of aggression, including relational aggression, which is comparatively less common in the home context. Thus, specific types, forms, and functions of aggression may be detected differently across home and school contexts and contribute to psychosocial outcomes differently. Future research that specifies context should also differentiate between kinds of aggression. Likewise, it would be useful to compare results when aggression is broadly construed by the CBCL, as in the current study, to studies in which aggression is directed specifically toward peers, including the widely studied forms (overt and relational) and functions (proactive and reactive). Relatedly, item-specific analyses rather than an

aggregate score of aggressive behavior may reveal more clearly whether and how child behavior is truly different at home and at school.

Methodologically, the use of autoregressive models prohibited the ability to disentangle within-person and between-person changes; thus, higher levels of outcome variables may reflect higher rank order or actual increases over time. Future research could employ a variety of innovative research techniques to develop a more complete understanding of context-specific aggression across developmental periods. Although a strength of the study was examining aggression in its continuous form rather than via arbitrary cut points or group-based analyses, it may be worthwhile to compare results using both methods. Group-based approaches may be able to detect effects for those with the highest levels of aggression. Likewise, it is important to keep in mind that the current study used a community sample, rather than a clinical sample; thus, results may not be generalizable to higher risk populations.

In conclusion, context-stability and context-specificity of aggression from childhood to adolescence were apparent. While aggression was quite stable, it was not commonly prevalent across settings, and aggression in one setting was not necessarily less impactful than aggression at both home and school, particularly as related to peer adjustment. For internalizing problems, early home-based aggression appeared more problematic than school-based aggression and a trend-level result also suggested that high levels of aggression across contexts may lead to more internalizing problems, although these results should be interpreted with caution. Results also suggested that context-specific aggression in the early years of elementary school may be particularly detrimental to academic achievement, regardless of whether aggression is more prevalent

at home or at school. Although home- and school-based aggression accounted for relatively little of the variance in outcomes, the findings are worth interpretation and consideration given the conservative nature of the analyses, as well as the inclusion of a range of control variables including demographic variables as well as earlier levels of the outcome variable.

Future research should attempt to uncover the mechanisms by which aggression that occurs primarily at home or at school is specifically linked to negative developmental outcomes. Indeed, while clinical diagnoses often require documented difficulties across settings, this study provides evidence that aggressive behavior during childhood in only one setting is relatively common and may be worthy of intervention and support to disrupt potential longer term negative developmental outcomes. The current study is an early steppingstone on the path to understanding context-specific behavior and the unique effects of aggression at home and at school.

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Table 1

Number of Participants (n) For Which Data is Available Across Measures and Grade

	K	1	2	3	6	7	8	9
CBCL - Mother	491	491	440	x	451	459	428	x
CBCL - Father	381	332	289	x	x	x	x	x
TRF - Teacher	574	537	517	x	444	426	403	x
Aggression - Peer	566	467	483	x	x	x	x	x
Academic Achievement	550	x	x	455	x	x	x	400
Peer Adjustment	566	x	x	477	x	x	x	411
YSR- Internalizing	x	x	x	x	x	x	x	411

Note. CBCL = Child Behavior Checklist; TRF = Teacher Report Form; YSR = Youth Self Report

Table 2

Correlations Among Childhood Aggression Latent Variables, Demographic and Control Variables, and Outcomes

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Race	-														
2. Sex	.02	-													
3. SES	-.39***	-.05	-												
4. Academic K	-.15***	.09*	.37***	-											
5. Academic 3	-.31***	.13**	.46***	.53***	-										
6. Academic 9	-.35***	.15**	.45***	.44***	.63***	-									
7. Peers K	-.07^{+}	.16***	.14**	.32***	.22***	.24***	-								
8. Peers 3	-.07	.04	.11*	.10*	.11*	.17**	.07	-							
9. Peers 9	.02	-.07	-.06	-.17**	-.21***	-.10+	-.20***	-.14**	-						
10. Int K (M)	-.04	.07	-.02	-.02	-.01	.01	-.01	.12*	.11*	-					
11. Int K (T)	.01	-.02	-.12**	-.21***	-.11*	-.11*	-.12**	-.05	.09+	.06	-				
12. Int 9	-.07	.19***	-.00	-.06	-.06	-.02	-.14**	-.09+	.62***	.16**	.11*	-			
13. Home Agg C	-.16**	-.05	-.24***	.02	-.02	-.06	-.12**	-.03	.07	.40***	-.03	-.09^{+}	-		
14. School Agg C	.01	-.31***	-.25***	.05	.03	-.00	-.38***	-.08*	-.11	-.04	-.03	.00	.42***	-	
15. Home Agg EA	-.08	-.09*	-.28***	-	-	-	-	-	-	-	-	-	.71***	.29***	-
16. School Agg EA	.25***	-.26***	-.34***	-	-	-	-	-	-	-	-	-	.38***	.65***	.47***
Mean (SD)	80%	52%	39.5(14.01)	2.19(.70)	0(1.79)	0(1.61)	.15(.97)	2.95(.56)	2.27(2.20)	6.52(4.93)	4.25(5.18)	9.45(7.43)	-	-	-

Note. Academic = academic achievement in kindergarten, 3rd and 9th grade; Peers = peer adjustment in kindergarten, 3rd, and 9th grade; Int = Internalizing Behaviors; M = Mother-report; T = Teacher-report; Home Agg C = Home-based aggression in childhood; School Agg C = School-based aggression in childhood; Home Agg EA = Home-based aggression in early adolescence; School Agg EA = School-based aggression in early adolescence; Race coded as 1 = white, 0 = Black or other ethnic minority; Sex coded as 1 = female, 0= male; $^{+}p < .10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

Table 3

Correlations Among Mother, Father, Teacher and Peer Reports of Aggression from K-2

	n	1	2	3	4	5	6	7	8	9	10	11	12
1. Mother K	567	-											
2. Father K	381	.40	-										
3. Teacher K	574	.24	.21	-									
4. Peer K	566	.19	.27	.54	-								
5. Mother 1st	491	.66	.42	.32	.21	-							
6. Father 1st	332	.42	.70	.25	.25	.56	-						
7. Teacher 1st	537	.21	.24	.56	.50	.26	.28	-					
8. Peer 1st	467	.18	.21	.51	.61	.17	.23	.58	-				
9. Mother 2nd	440	.59	.35	.28	.23	.69	.47	.31	.21	-			
10. Father 2nd	289	.38	.61	.28	.27	.52	.65	.31	.27	.57	-		
11. Teacher 2nd	517	.27	.26	.55	.45	.28	.26	.56	.52	.29	.32	-	
12. Peer 2nd	483	.16	.18	.48	.51	.18	.18	.51	.60	.27	.26	.58	-
Mean (*SD*)		9.52(5.90)	8.24(5.51)	4.80(7.41)	-.12(.93)	8.57(5.76)	7.30(5.39)	5.56(8.33)	-.11(.91)	7.96(5.59)	6.52(4.51)	5.85(8.82)	-.08(.96)

Note. All correlations significant at the p <.001 level. Mother and father reports from the aggression subscale of the CBCL and teacher reports from the aggression subscale of the TRF

Table 4

Correlations Among Mother and Teacher Reports of Aggression from 6-8th Grade

	n	1	2	3	4	5	6
1. Mother 6th	451	-					
2. Teacher 6th	444	.22	-				
3. Mother 7th	459	.74	.29	-			
4. Teacher 7th	426	.27	.51	.31	-		
5. Mother 8th	428	.68	.19	.78	.33	-	
6. Teacher 8th	403	.24	.46	.33	.52	.41	-
Mean (*SD*)		7.23(5.73)	5.90(8.90)	7.71(5.69)	5.43(8.11)	7.47(5.80)	6.23(9.69)

Note. All correlations significant at the $p < .001$ level.

Table 5

Fit Statistics for Context-Specific Aggression Profiles (N = 583)

Model	AIC	BIC	Adj. LRT	Entropy
One-class	31,200.68	31,305.51	-	1.00
Two-class	29,634.59	29,796.21	1,573.09 ($p < .001$)	0.95
Three-class	29,226.08	29,444.49	429.32 ($p = .03$)	0.82
Four-class	**28,994.52**	**29,269.71**	**254.49 ($p = .29$)**	**0.85**
Five-class	28,774.54	29,106.52	243.04 ($p = .33$)	0.84

Note. Bold-type indicates the selected model. AIC = Akaike Information Criterion; BIC = Bayesian information criterion; Adj. LRT = Lo-Mendell-Rubin adjusted likelihood ratio test.

Table 6

Results of Polynomial Regression with Response Surface Analyses (Unstandardized Results)

	Adjustment Outcome				
Description/Parameter	Academics 3rd	Academics 9th	Peer Adj. 3rd	Peer Adj. 9th	Internalizing 9th
Overall, *M* (*SD*)	0 (1.79)	0 (1.61)	2.95(.56)	2.27(2.16)	9.45(7.43)
Polynomial Regression Results					
Step 1					
Gender	.46**	.49**	-	-	2.73***
Race	-.60**	-.74***	-	-	-
SES	.03***	.03***	.003^{+}	-	-
Outcome in K	1.04***	.86***	.03	-.47***	m (.23**) t (.16*)
R^2	.39	.35	.01	.04	.07
Step 2					
Home-based aggression	-.05^{+}	-.11***	-.01	.13**	.34*
R^2/R^2 change	.39/.00	.37/.02	.01/.00	.06/.02	.08/.01
Step 3					
School-based aggression	-.02	-.06*	-.01	.03	-.05
Home-based aggression^2	-.01	-.01	-.00	.00	.00
School-based aggression^2	.00	.00	.00	-.01+	-.01
School X Home	.01*	.00	-.00	-.00	.01
R^2/R^2 change	.40/.01	.38/.01	.02/.01	.07/.01	.09/.01
Response Surface Parameters					
Slope of line of congruence ($X = Y$) α_1	-.07	-.13**	-.02	.15*	.39^{+}
Curvature of line of congruence ($X = Y$) α_2	.00	.00	.00	-.01	.01
Slope of line of incongruence ($X = -Y$) α_3	-.03	-.02	.01	.10	.29
Curvature of line of incongruence ($X = -Y$) α_4	-.03*	-.01	.00	.00	-.02

$^{\dagger}p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$

Table 7

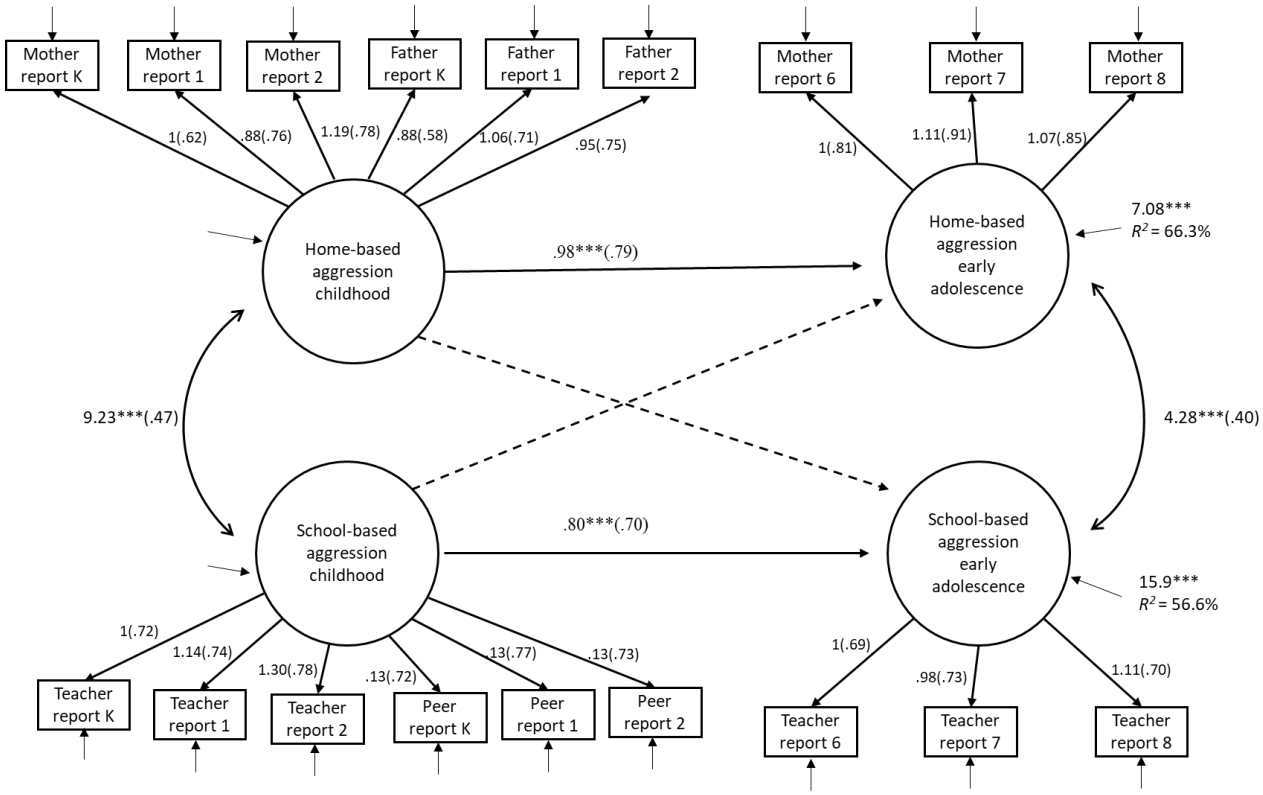
Results of Polynomial Regression Analysis using Latent Variables Representing Home-based and School-based Aggression

	Adjustment Outcome				
Description/Parameter	Academics 3rd	Academics 9th	Peer Adj. 3rd	Peer Adj. 9th	Internalizing 9th
Overall, *M* (*SD*)	0 (1.79)	0 (1.61)	2.95(.56)	2.27(2.16)	9.45(7.43)
Polynomial Regression Results					
Gender	.42**	.29^{+}	-	-	2.87**
Race	-.67**	-.86***	-	-	-
SES	.03***	.02***	.00	-	-
Outcome in K	.95***	.70***	.00	-.40**	(m).12 (t).14^{+}
Home-based aggression	-.06	-.07*	-.00	.14**	.18
School-based aggression	-.00	-.05*	-.02	.01	.04
Home-based aggression^{2}	-.04	-.00	.00	.01	.02
School-based aggression^{2}	-.00	.00	.00	-.01	-.01
School X Home	.03^{+}	.00	-.00	-.01	.01

Note. Final model presented. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$; $***p < .001$

Figure 1

Cross-lagged panel model: Home-based and school-based aggression in childhood as predictors of home-based and school-based aggression in early adolescence.

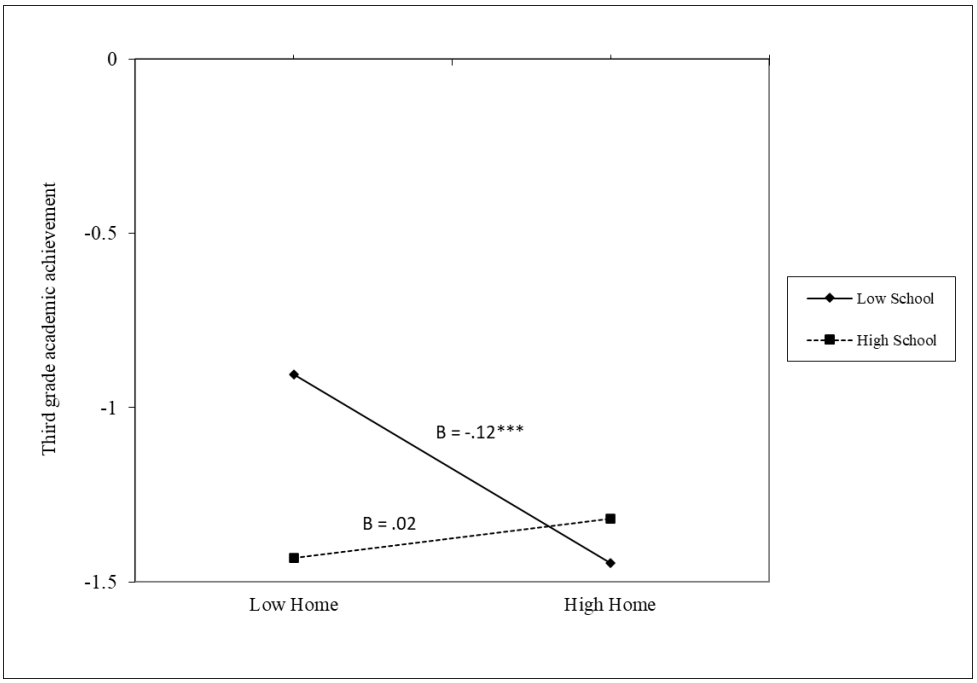


Note. Unstandardized coefficients (standardized estimates in parentheses). Dashed lines are nonsignificant associations.

***$p < .001$

Figure 2

Associations between home-based aggression in childhood and academic achievement in third grade at lower and higher levels of school-based aggression in childhood.

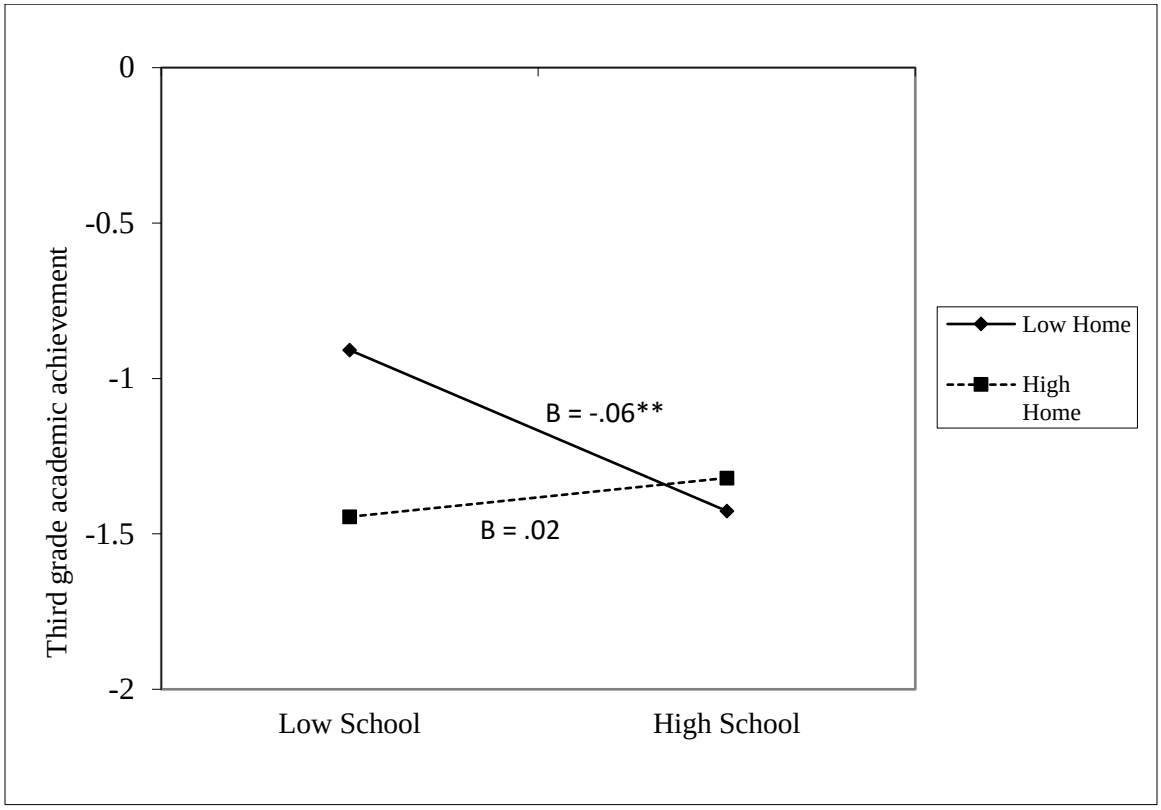


Note.

***$p < .001$

Figure 3

Associations between school-based aggression in childhood and academic achievement in third grade at lower and higher levels of home-based aggression in childhood.



Note.

** $p < .01$

Figure 4

Three-dimensional representation of outcomes of interest a) third grade academic achievement, b) ninth grade academic achievement, c) ninth grade peer adjustment, and d) ninth grade internalizing problems as a function of home-based and school-based aggression based on response surface analyses using factor scores.