Parallel Trajectories of Proactive and Reactive Aggression in Middle Childhood and Their Outcomes in Early Adolescence

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Abstract

This study used an accelerated longitudinal design to investigate trajectories of proactive and reactive aggression in middle childhood and their outcomes in early adolescence. Children ($N = 1420$; ages 5–12; 48% female) were assessed biannually over 6 school years. Classroom teachers rated students' proactive and reactive aggression throughout grades K-5; and multi-method (teacher-report, self-report, school records) measures of peer problems, depressive symptoms, academic performance, disciplinary actions, and school absenteeism were collected throughout grades 3–5. Latent class growth models were estimated to differentiate parallel-process trajectories of proactive-reactive aggression. Class membership was then examined as a predictor of outcomes at the end of 5th grade. The best-fitting solution had four trajectory classes: (1) *low aggression*, 76.7%; (2) *high proactive-reactive aggression,* 4.7%; (3) *declining aggression*, 4.9%; and (4) *predominantly reactive aggression*, 13.7%. Most classes showed seasonal upticks in aggressive behavior in the spring semester relative to fall; these were especially pronounced for proactive aggression, both as a variable and for the proactive-reactive class. Relative to their low-aggression peers, children in any elevated-aggression class had higher levels of peer problems, depressive symptoms, and disciplinary actions and lower GPAs at the end of 5th grade. The reactive class—which on no occasion had the highest *total* aggression—exhibited the most consistently unfavorable pattern of outcomes across methods and measures. Findings offer new insights concerning the multifinality and heterogeneity of aggressive behavior in childhood. Research, theory, and practice could benefit from adopting person-centered conceptualizations that consider the long-term trajectories, short-term variations, and proactive vs. reactive functions of youth aggression.

Keywords Proactive and reactive aggression · Developmental trajectories · School outcomes · Peer functioning · Depression

Introduction

Children with elevated and persistent patterns of aggressive behavior are at greater risk for an array of negative outcomes over time (e.g., Bevilacqua et al. 2018). Some of these outcomes are homotypic in nature, being aligned phenomenologically with aggression (e.g., severe antisocial behavior, criminal offending, substance use), whereas others are heterotypic, cutting into other domains of psychopathology and functioning (e.g., internalizing disorders, peer problems, and poorer academic, occupational, and health outcomes; Copeland et al. 2009). In other words, developmental research on aggressive behavior reflects a pattern of multifinality, where a single problem can lead to myriad similar or different problems over time (Cicchetti and Rogosch 2002). An important question remains: Which patterns of aggressive behavior predict what outcomes? The present study investigates this question using an accelerated longitudinal design to model parallel-process trajectories of proactive and reactive aggression and their multimodal outcomes in a large school sample.

Developmental Models of Youth Aggressive Behavior

Research on youth antisocial behavior has a rich history spanning disciplines, methods, and theoretical approaches. Despite

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this heterogeneity, there are a few unifying questions that developmental models commonly seek to answer: Why do some children become aggressive and others do not? What are the outcomes for aggressive youth? And how do we understand different variations in these problems—for example, why do some aggressive children go on to experience psychosocial impairment in this versus that domain, or not at all?

Some of these questions are, in certain respects, well-answered; but other questions persist. It is clear that youth who exhibit significant aggressive behavior are at an increased risk for poorer outcomes in several areas of psychosocial functioning, including academic, social, and mental health outcomes (Brennan et al. 2012; Campbell et al. 2006; Chen et al. 2010; Crick et al. 2006; Fite et al. 2016). Indeed, the strongest predictors of antisocial behavior in adolescence and adulthood include early and persistent patterns of such behaviors that emerge in childhood (Frick and Viding 2009; Moffitt 2008). At the same time, children who show significant aggressive behavior are also more likely to experience depression and internalizing problems, both concurrently and prospectively (Campbell et al. 2006; Coie et al. 1995; Panak and Garber 1992), even into adulthood (Loth et al. 2014). But poor outcomes are not universal. Many youths show aggressive behavior, especially early in childhood when this is normative (Fite et al. 2016), and these behaviors and their negative sequelae desist over time (Moffitt 2008). Thus, youth aggression is a complex phenomenon, perhaps best understood within a developmental psychopathology framework (Cicchetti and Rogosch 2002): involving an interplay between typical and atypical development, and reflecting a pattern of multifinality with both heterotypic and homotypic outcomes. In the present study, we adopt such a framework to investigate variations in the developmental trajectories and outcomes of aggressive behavior in youth.

Developmental models often attempt to answer these key questions by classifying children—implicitly or explicitly—into two or more categories (e.g., aggressive or not; life-course persistent, adolescent-limited, and non-offenders) and then investigating associations among variables. For example, Patterson's failure model (Patterson and Capaldi 1990; Patterson and Stoolmiller 1991) posited that young children who are more aggressive than their peers are at-risk for "failures" in peer and academic domains, which in turn may represent dual pathways to later depression and delinquency. (Non-aggressive children would not follow these same pathways.) The failure model is useful in part because it incorporates multiple documented outcomes of child aggression. But despite its utility and evidence supporting the model's individual bivariate associations (e.g., Brennan et al. 2012; Campbell et al. 2006; Chen et al. 2010; Day et al. 1992; Gooren et al. 2011; McCarty et al. 2008; Morrow et al. 2006) evidence in support of the model *as a whole* is mixed (Obradović et al. 2010; van Lier et al. 2012), including in our own research involving a prior subset of the present sample (Evans and Fite 2019). Given that results for the overall model are inconsistent with evidence for its components, a different approach is needed to understand these developmental pathways better.

One limitation of most prior studies is that they have relied on variable-centered models involving cross-sectional or lagged designs investigating associations between variables at 2+ occasions. Such models focus on covariation in variables, sometimes longitudinally, but they fail to identify relevant subgroups of individuals and their characteristics in relation to those variables, which often is a more accurate representation of the questions researchers wish to answer (Lanza and Cooper 2016). Another limitation is that prior studies have tended to neglect the different functions of aggressive behavior (Fite et al. 2016). Accordingly, we adopt two strategies that seem especially promising for advancing the literature: *person-centered approaches*, to identify key subgroups on a variable of interest; and *multidimensional approaches*, parsing that phenomenon of interest to better reflect its heterogeneity.

Person-Centered and Multidimensional Conceptualizations

The failure model, and many other developmental models of antisocial behavior, are predicated upon person-centered ideas. That is, these models assert that youth who follow an antisocial pathway are to some extent different from their typically developing peers; and that among aggressive youths, there exist subgroups that differ from one another, which help account for diverging outcomes (Frick and Viding 2009; Moffitt 2008). These subgroups may not reflect true variance in the population, but they can be favored in part because *categorical models are useful* (Coghill and Sonuga-Barke 2012) for purposes like identifying aggressive youth, assigning diagnoses, and selecting interventions. To model such groups, aggression researchers have used median splits or cutoffs to define high vs. low levels on aggression variables. These manual splitting methods have generally fallen out of favor, replaced by dimensional approaches that capture the full variance of aggression and its subtypes (Fite et al. 2016). More modern techniques allow researchers to model person-centered subgroups from dimensional data (Jung and Wickrama 2008; Nagin and Tremblay 1999). Such approaches have been used extensively to model latent trajectories, contributing to advances in our developmental understanding of aggression and antisocial behavior (Bevilacqua et al. 2018; Côté et al. 2007; Givens and Reid 2019; Joussemet et al. 2008; Moffitt 2008; Shaw et al. 2003). However, most studies examine growth only on one variable, failing to capture aggression's heterogeneity. Incorporating multidimensional variables may lead to further progress.

Thus, a second useful strategy for advancing research in this area involves delineating the proactive and reactive functions of aggression (Fite et al. 2016; Hubbard et al. 2010). *Proactive aggression* is instrumental and goal-oriented, often conceptualized from a social learning perspective (Bandura 1978). *Reactive aggression* is emotionally dysregulated and motivated by perceived threat, often understood from the frustration-aggression hypothesis (Berkowitz 1989). Proactive aggression is linked to outcomes such as delinquency whereas reactive aggression is linked to internalizing, academic, and peer problems (Card and Little 2006; Fite et al. 2010, 2016; Hubbard et al. 2010). Recently, latent growth curve methods have been used to model trajectories of proactive and reactive aggression, offering insight into their associations with antecedents and outcomes (Fite et al. 2008; Ojanen and Kiefer 2013). However, these studies do not identify classes of trajectories, as implied by theory and needed for practice. Group-based modeling may be particularly useful in this area given that proactive and reactive aggression are highly but asymmetrically correlated with one another and with correlates (Card and Little 2006). That is, reactive aggression often occurs in the absence of proactive, but not vice versa (Fite et al. 2016), with the potential for known associations with correlates to be overshadowed in variable-centered models due to their shared variance (Evans and Fite 2019).

Three studies have examined longitudinal latent classes of proactive-reactive aggression in youth. First, Barker et al. (2006) estimated joint trajectories of aggression functions in boys ages 13–17, finding a three-class solution (high peaking, moderate desisting, never) for both proactive and reactive trajectories, with high correspondence between functions and membership in the high-peaking class doubling one's risk for gang affiliation; however, their analysis was limited to males and to adolescents. Second, Cui et al. (2016) examined distinct and parallel-process trajectories of proactive and reactive aggression among children from ages 7–12, finding evidence for a six-class solution: low-stable, dual moderate, moderate-decreasing, dual high-increasing, high-stable, and dual low-increasing trajectories. Third, Girard et al. (2019) estimated trajectories of form-by-function aggression subtypes from ages 6–13 and found evidence for five classes: non-aggressors, low-stable, moderate-engagers, high-desisting, and high-chronic. Although these last two studies advanced our understanding of trajectories and antecedent predictors of proactive-reactive aggression trajectory membership, further investigation is needed to understand better the developmental profiles of aggression in youth. In particular, little is known about developmental outcomes of proactive-reactive aggression class trajectories.

To our knowledge, no studies have examined person-centered trajectories and outcomes of proactive-reactive aggression among school-age youth. Further, knowledge of *ecological* outcomes—such as school grades, attendance, and disciplinary actions—is particularly limited, despite their relevance to families, schools, and policymakers. The present study contributes to the literature by examining these variables, along with peer problems and depressive symptoms, all measured via multiple methods, as outcomes of proactive-reactive aggression trajectories.

Associations with Social-Emotional and School Outcomes

A large literature (briefly summarized here) has examined aggression's links with depression, peer problems, and school outcomes. However, evidence remains more limited regarding person-centered approaches and proactive-reactive aggression subtypes.

The link between childhood aggression and subsequent depression has been established (e.g., Lee and Bukowski 2012; Wang et al. 2018). Functions of aggression appear to be an important factor in this association, with several studies indicating that reactive, not proactive, aggression is linked to depressive symptoms in childhood (Card and Little 2006; Fite et al. 2016). Aggression trajectories appear to play a role. Youth with high-stable aggression from ages 2–9 showed greater internalizing problems by age 12, but those with high-desisting aggression did not experience later internalizing problems (Campbell et al. 2006).

Similarly, early aggression predicts peer rejection, victimization, and social skills deficits later in childhood (Campbell et al. 2006; Gooren et al. 2011; van Lier et al. 2012), although this association may depend on the type of aggression (Card and Little 2006; Frey and Strong 2018). Campbell et al. (2006) found that low, moderate, or high levels of aggressive symptoms between ages 2 and 9 predict greater social skills deficits and peer problems by age 12. When type of aggression is considered, only reactive aggression predicts later peer rejection (Evans and Fite 2019; Frey and Strong 2018). In fact, proactive aggression is often linked to *decreased* peer victimization later in childhood (Card and Little 2006; Frey and Strong 2018).

Aggressive behavior has been linked consistently to poor academic performance in youth (Day et al. 1992; Loveland et al. 2007). However, these studies mainly focus on general aggression or forms (i.e., physical vs. relational) but not functions of aggression. Limited research has examined the unique associations of proactive and reactive aggression with academic performance (e.g., Day et al. 1992; Evans and Fite 2019). Fite et al. (2013) found that only reactive aggression was linked to poorer academic performance in school-age youth. Proactive aggression seems to be uncorrelated or even positively correlated with academic performance (Evans and Fite 2019). These diverging findings could be explained by cognitive and self-regulatory abilities, which are associated negatively with reactive aggression and either positively or

not associated with proactive (Fite et al. 2016; White et al. 2013). As such, reactive aggression likely better accounts for the negative aggression-academics link.

Achievement, however, is not the only index of school success. Research and practice point to school discipline and absenteeism as important concerns among aggressive youth. Theoretically, absences and discipline could operate as what Moffitt (2008) referred to as "snares"—acute psychosocial challenges hindering development. Proactive and reactive aggression may both be associated with behaviors that could warrant school discipline (e.g., fighting, stealing, destroying property; Barker et al. 2006; Vitaro et al. 2002), a finding which is in line with their distinct correlations with delinquency (Card and Little 2006). Further, aggression predicts school absences and dropouts (Farmer et al. 2003; Lounsbury et al. 2004; Schwartz et al. 2006), problems that have far-reaching implications including ethnic minority achievement gaps and the school-to-prison pipeline (Basch 2011; French and Conrad 2001; Wald and Losen 2003). Such studies have generally targeted adolescence, but prevention and intervention efforts may be served better at younger ages. Thus, the current sample spans early childhood (e.g., 0–8 years) to early adolescence (e.g., 10–19 years; per World Health Organization 2019).

The Present Study

We used an accelerated-longitudinal, person-centered design to investigate trajectories of aggression functions in childhood and their outcomes in early adolescence. A large sample was assessed every semester over 6 school years. Parallel process growth mixture models were estimated to differentiate latent trajectories of teacher-rated proactive and reactive aggression. Next, these classes were examined as predictors of social-emotional and school outcomes assessed via multiple methods in grades 3–5. In light of our exploratory modeling techniques, firm quantitative hypotheses were not appropriate; still, we had some general expectations. There are a preponderance of 3- to 5-class solutions in the aggression trajectories literature (e.g., Barker et al. 2006; Brame et al. 2001; Côté et al. 2007; Girard et al. 2019; Joussemet et al. 2008; Schaeffer et al. 2003; Wildeboer et al. 2015), so we hypothesized as many would emerge from our data, with the largest being low or non-aggressive youth (Fanti and Henrich 2010; Nagin and Tremblay 1999; Reinke et al. 2012; Silver et al. 2010). We expected that the smaller classes might include a reactive-only group and a proactive-reactive group, given evidence that proactive aggression occurs at lower levels than, and is typically accompanied by, reactive aggression, but not vice versa (Barker et al. 2006; Cui et al. 2016; Girard et al. 2019; Fite et al. 2016). Prior trajectories studies cited above also led us to expect low-stable, high-stable, declining, and possibly increasing patterns, with specific details contingent on number of classes. Based on the literature reviewed here,

aggressive youth were expected to have lower GPAs and more disciplinary actions and absences, and the reactive-only class was expected to show greater depressive symptoms, relative to the low-aggression class. All hypotheses were embedded within developmental psychopathology's tenets of equifinality-multifinality and typicality-atypicality.

Method

Participants and Procedures

Participants were students in kindergarten through 5th grade at an elementary school in the U.S. Midwest from 2012 to 2018 (12 semesters over 6 school years). Teacher-report, youth-report, and school records data were collected every semester, with a few exceptions for specific measures, informants, and semesters (see Table 1). Children (52% boys, 48% girls) were ages 5 to 12 years over their time in elementary school, with 5th grade spring data collected at about age 11 (M_{age} = 10.76 years, SD = 0.51). Race and ethnicity data were not collected at the person-level, but school-level records show that 79% of students were White and 21% identified any racial minority background (9% Black, 6% Hawaiian/Pacific Islander, 4% Native American, 2% Asian/Asian American); 5% identified their ethnicity as Hispanic. About 35% of students were eligible for free or reduced-cost lunch. Town census records from 2012 show a similar racial and ethnic composition and a median household income of $65,197.

Teacher-report data were collected in the last 2 months of each semester via Qualtrics, with teachers completing brief surveys regarding their students, with compensation once surveys were completed. Youth self-report data were collected in grades 3–5, occurring in the same window as teacher-report data collection. Trained undergraduate and graduate research assistants read measures aloud in groups while students followed along with paper and pencil. School records were provided to the research team by the district's data specialist, with approval from the administrators. Records included students' grades, days absent, and disciplinary actions each semester during the study. Data were deidentified and assigned study IDs prior to research use. All procedures were approved by the IRB at the University of Kansas and by the school's administrators. For each round of data collection, informed consent (parents, teachers) and assent (students) were collected as appropriate. Specifically, the school provided parents with advance written information about the study, including the opportunity to give written consent for their child to complete self-report surveys. Children whose parents had provided consent were later given the opportunity to participate during in-person assessments or to decline. Teachers gave consent regarding their own participation in rating their classroom students.

Table 1 Longitudinal accelerated design data structure

Cohort	Grade level and semester												Total N
	Kindergarten		1st		2nd		3rd		4th		5th		
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	
A	–	–	–	–	–	–	–	–	12F[a]	13S[b]	13F	14S	158
B	–	–	–	–	–	–	12F[a]	13S[b]	13F	14S	14F	15S	136
C	–	–	–	–	12F[a]	13S[b]	13F	14S	14F	15S	15F	16S	150
D	–	–	12F[a]	13S[b]	13F	14S	14F	15S	15F	16S	16F	17S	180
E	12F[a]	13S[b]	13F	14S	14F	15S	15F	16S	16F	17S	17F	18S[c]	162
F	13F	14S	14F	15S	15F	16S	16F	17S	17F	18S[c]	–	–	188
G	14F	15S	15F	16S	16F	17S	17F	18S[c]	–	–	–	–	150
H	15F	16S	16F	17S	17F	18S[c]	–	–	–	–	–	–	169
I	16F	17S	17F	18S[c]	–	–	–	–	–	–	–	–	130
Teacher report N	519	394	732	527	755	457	768	519	764	492	650	508	1418
Child report N							506	498	491	480	497	486	831
School records N							775	768	792	779	653	637	1018
Total N	519	394	732	527	755	457	775	768	792	779	653	637	1420

Measurement occasions are listed in body of table as calendar year followed by semester (e.g., 12F = fall 2012). Cells containing dashes were treated as planned missing data in analysis, whereas italics indicate measurements not intended for analysis. All data were collected at all occasions with only the following exceptions: [a] Child-reported peer problems, child-reported depression, and teacher-reported depression not collected in 12F. [b] No teacher- or child-report data were collected in 13S. [c] No teacher-report data were collected in 18S

The overall participation rate for teachers was about 94%, ranging by wave from 91% (Spring 2015) to 100% (Spring 2017, Fall 2017). For youth self-report, participation was about 76%, with wave-specific estimates ranging from 60% (Fall 2012) to 81% (Fall 2015). Raw school records data captured the entire enrolled student population, and deidentified records data were retained for analysis if they could be matched to a child for whom teacher- and/or self-report data were collected on at least one occasion. For this analysis, an initial total sample of $N = 1660$ unique students in 11 grade cohorts was assessed on at least one occasion while in grades K-5 during the data collection window. Considering our planned missing data (Table 1) and that 2 observations are required to estimate a linear slope (Grimm et al. 2016), we restricted the sample to cohorts for whom teacher-report data were collected on ≥2 occasions (a common practice; Campbell et al. 2006; Fanti and Henrich 2010; Girard et al. 2019). Consequently, students who were in 5th grade at the study's beginning ($n = 104$) or in kindergarten at the end ($n = 124$) were dropped, leaving a sample of 1432. Next, participants whose grade cohort membership changed (e.g., suggesting that they were retained a grade level, $n = 9$) were also removed, reducing the sample to 1423. At this point, three participants had missing data on all variables of interest, resulting in a final sample of $N = 1420$ for analysis.

Measures

Aggression measures were collected across grades K-5; all other measures were collected in grades 3–5 (Table 1). Mean scores were used for all rating scale data.

Proactive and Reactive Aggression Aggression was assessed via teacher-report using Dodge and Coie's (1987) six-item scale. This measure has three items for proactive (e.g., gets other kids to gang up on somebody they do not like) and three for reactive (e.g., gets angry easily when teased or threatened), each rated on a scale from 1 (*never*) to 5 (*almost always*). Evidence supports the PRA's two-factor (proactive vs. reactive) measurement structure and its validity in terms of social-emotional correlates (e.g., Dodge and Coie 1987; Hubbard et al. 2010). Internal consistency was good for both proactive ($\alpha = 0.83$–0.87, $Mdn = 0.85$) and reactive ($\alpha = 0.93$–0.95, $Mdn = 0.94$) aggression at all occasions.

Peer Problems Peer problems were measured using four items from the Teacher Report Form and Youth Self Report (TRF/YSR; Achenbach and Rescorla 2001), assessing four facets of peer functioning (difficulty getting along with peers; feeling like others are out to get them; being teased; not being liked). Items were rated on a three-point scale, from 1 (*not true*) to 3

(*very or often true*). The teacher and student versions have shown evidence of convergent, divergent, and criterion-related validity with measures of social functioning and other relevant constructs, such as academic, internalizing, and disruptive behavior problems in school-age populations (Evans et al. 2016, 2019). Internal consistency was good for teacher-report ($\alpha = 0.70$–0.86; $Mdn = 0.77$) and generally acceptable for youth-report ($\alpha = 0.65$–0.74 except for T2 at $\alpha = 0.57$; $Mdn = 0.72$).

Depressive Symptoms Teachers completed the eight-item TRF Withdrawn-Depressed scale (Achenbach and Rescorla 2001). This scale measures symptoms of depression (e.g., unhappiness, low energy) and social withdrawal (e.g., desire to be alone), rated on the same 1–3 scale as peer problems. There is substantial evidence for its reliability and validity, including strong correlations with other categorical and dimensional measures of youth depression (Achenbach and Rescorla 2001). As a converging self-report measure, the 13-item Short Mood and Feelings Questionnaire (SMFQ; Angold et al. 1995) was administered to students. Items reflect cognitive-behavioral (e.g., nobody really loves me, cry a lot) indicators of depression over the past 2 weeks, rated on a scale from 1 (*not true*) to 3 (*true*). Previous research supports the factor structure and convergent, predictive, and criterion validity of the SMFQ with diagnostic interviews and inventories for depression among children as young as 6 years old (Angold et al. 1995; Kuo et al. 2005). Internal consistency for depression measures was good for both teachers ($\alpha = 0.86$–0.91, $Mdn = 0.88$) and youths ($\alpha = 0.87$–0.91; $Mdn = 0.88$).

Grade-Point Average (GPA) Overall semester GPAs were calculated from school records. Students' subject-specific quarter grades in core classes (science, social sciences, math, reading, language arts) were binned ($\geq 97.0\% = $ A+; 93.0–$96.9\% = $ A; 90.0–$92.9\% = $ A−; etc.), converted to a standard 4-point GPA scale (A+ = 4.30; A = 4.00; A− = 3.70; etc.), and averaged to form an overall GPA indicator of their performance each semester. A standard 4-point "plus-minus" scale was used. Thus, the resultant GPA variable ranged from 0.00 (F) to 4.30 (A+).

School Absenteeism Using school records, students' absenteeism was coded as the total number of days a student was absent each semester. "Absent" was operationalized at the child level as not being present on a day when they were enrolled and classes were in session. The school recorded absences in terms of whole and half days. For the present analysis, each student's total absences per semester was calculated by summing these values and rounding up to the nearest whole integer, as appropriate for count data. In this sample, 83–90% of the students at each semester in 3rd-5th grade missed at least one day, with the medians falling at 2–3 days; however, maximum values reached as high as 18–32 days absent.

Disciplinary Actions Discipline data were tallied to generate a sum count of the disciplinary actions for each student in each semester. Examples include dress code violations, bullying, and cursing. If a student's records showed no indication of a disciplinary occurrence in a given semester but did indicate that they were enrolled, a score of 0 disciplinary actions was imputed. Most students (61–74% per semester) did not have any disciplinary actions, with the median being 0 for each semester; however, maximum values reached as high as 17–90, with a small minority of students accounting for the majority of the disciplinary actions.

Overview of Analytic Approach

Analyses were carried out in two phases, summarized below and detailed in Supplement 1. All models were estimated in Mplus Version 8 (Muthén & Muthén 1998-2017) with robust maximum likelihood (MLR) estimation to accommodate missing data and moderate nonnormality. First, a series of latent class growth models (LCGMs; Nagin 1999) were estimated to identify the best-fitting parallel-process model of proactive and reactive aggression over time. This process included inspection of observed means; estimation of 1- to 7-class solutions for proactive and reactive aggression, both separately and together; and consideration of models with varying terms for polynomials (intercept, linear, quadratic, cubic) and seasonality (a latent intercept for the spring semester). Cohort effects were explored and, if detected at $p < 0.10$, were controlled for in the final model. Model evaluation included holistic consideration of relative fit indices (AIC, BIC, sample-adjusted BIC), entropy, likelihood ratio tests, classification probabilities, group sizes, over-extraction, and class interpretability and distinctiveness. Second, we examined LCGM class membership as predictors of outcomes assessed each semester from grades 3 to 5. These models were specified separately for each outcome, using standard MLR regression for semi-normally distributed continuous outcomes (e.g., GPA, peer problems) and MLR negative binomial models for count-distributed outcomes (discipline, days absent). These growth models were estimated unconditionally first, then with class membership as a categorical predictor of the linear slope and intercept set at the spring of 5th grade, controlling for gender. Outcome models were specified thusly to determine whether class membership predicted outcome variables' *levels* at the end of 5th grade and *rates of change* over grades 3–5.

Results

Distributional characteristics of the data were in line with expectations. Aggression levels peaked around 1st grade and were slightly higher in spring than fall semesters (Table S1). Further, reactive aggression was consistently higher than

proactive, and the proactive-reactive correlation ranged from 0.66–0.76, supporting the appropriateness of parallel-process LCGM to help tease them apart. Outcome variables generally showed distributional characteristics and correlations as expected, with associations being higher when from the same informant, the same variable, or occurring closer in time in an absolute or seasonal sense (Tables S2-S3).

Latent Trajectories of Proactive and Reactive Aggression

Class Enumeration In estimating LCGMs for 2–7 classes, models generally converged successfully, with high entropy (above 0.87) indicating good separation in all models (see Table S4 for model statistics). The AIC and BIC indices showed the most precipitous improvements in models with 2–4 classes, suggesting a 2- to 4-class solution may fit well (despite continued incremental improvement with more complex models). The LRT indices were significant for the 2-class solution and marginal ($p = 0.08$) for the 4-class solution; all others were nonsignificant. The BLRT was consistently significant, reflecting the possibility of over-extracting classes, given that K classes always fit better than K-1 classes. However, the BLRTs for classes 5–7 did not replicate the best loglikelihood, suggesting that the results may not be trustworthy. Further, models with 5–7 classes began to show sub-optimal minimum classification probabilities (75% or less), as compared to prior models with 2–4 classes (85% or higher); and the classes became quite small (<4%) and did not appear theoretically meaningful. The 4-class model appeared substantively meaningful and fit the data well. It was therefore retained as the preferred model.

When cohort effects were added, the 4-class model again converged and the best log-likelihood value was replicated. The distribution of youths across the four classes showed minor shifts from the prior model without covariates,[1] suggesting that controlling for cohort had a small effect on class formation. In the final model, entropy (0.92), latent class probabilities (0.88–0.98, $Mdn = 0.92$), and classification probabilities (0.85–0.98, $Mdn = 0.90$) all remained high, indicating a very "clean" class separation.[2]

An omnibus chi square test showed that class membership was not associated with cohort $\chi^2(df = 24) = 20.38$, $p = 0.68$.[3]

Class Interpretation Model-estimated and observed trajectories for all four classes are plotted in Fig. 1, with parameter estimates and observed gender distributions reported in Table 2. Class 1 captured the large majority (77%) of youths, reflecting a normative pattern hereafter labeled "*Low Aggression*." Despite having statistically significant or marginal terms (Table 2), these effects do not appear meaningful (Fig. 1). Proactive aggression consistently fell near the scale's floor, and reactive aggression was within rounding error of the floor. Gender (47% boys, 53% girls) was roughly evenly distributed, skewing slightly female relative to the full sample. Class 2 (5% of the sample) showed "*High Proactive-Reactive Aggression*," with high-stable reactive aggression and high-increasing proactive aggression. There was a pronounced seasonal effect for both aggression types, with the transition from fall to spring predicting upticks in reactive and proactive aggression. Youth in this class were 63% boys. Class 3 captured 5% of the sample and can be identified as "*Declining Aggression*." They had the highest levels of both types of aggression at baseline, but this decreased steadily over time, resembling the Low Aggression Class by 5th grade. These long-term patterns were sharp and significant, but seasonal variability was not. Two-thirds (66%) of this group were boys. Finally, Class 4 (14%) showed a pattern of "*Predominantly Reactive Aggression*," where reactive aggression started and remained high, with no significant change patterns. In contrast, proactive aggression remained relatively low, but significantly above the scale's floor and with a slight seasonal and long-term increases. Three-fourths (75%) of this group were boys. Evidence for the validity of these groups can be explored in terms of their bivariate correlations with outcomes (Tables S5-S6).[4]

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[1] Class 1 shifted from 73% to 77%; Class 4 from 18% to 14%; and Classes 2 and 3 both changed by about 1%, each capturing about 5% of the sample in the final model.

[2] To further investigate the cleanness and stability of the final solution, we examined individuals' probabilities of class membership (a continuous value, 0–1) and most likely class memberships (binary, 0 or 1) in terms of their correlations with observed outcome variables (Tables S5-S6). Point-biserial correlations for assigned classes were attenuated by an average of 0.01 points (range 0.00 to 0.05) relative to their corresponding Pearson's r correlations for class probabilities. Only 4 of 192 (2%) associations attenuated from significant to nonsignificant. Thus, our method of exporting youths' most likely class memberships had negligible effect on associations with outcomes.

[3] Within each cohort, for example, Class 1 always captured 73–81% of youth. Results were similarly consistent for Class 2 (2–7%), Class 3 (2–8%), and Class 4 (12–16%), supporting the robustness of the four-class solution across cohorts and occasions.

[4] As an example of evidence for validity, membership in the Low Aggression Class correlated favorably with peer, depression, academic, and disciplinary variables at all occasions, whereas the three elevated-aggression classes were correlated with poorer outcomes on these variables. Further, among the three aggressive classes, the two classes characterized by *persistent* aggression (Proactive-Reactive and Reactive) showed correlations with peer and discipline problems that were largely consistent across grades 3–5, whereas those in the *Declining* class showed similar correlations at earlier occasions but not in 5th grade (Tables S5-S6).
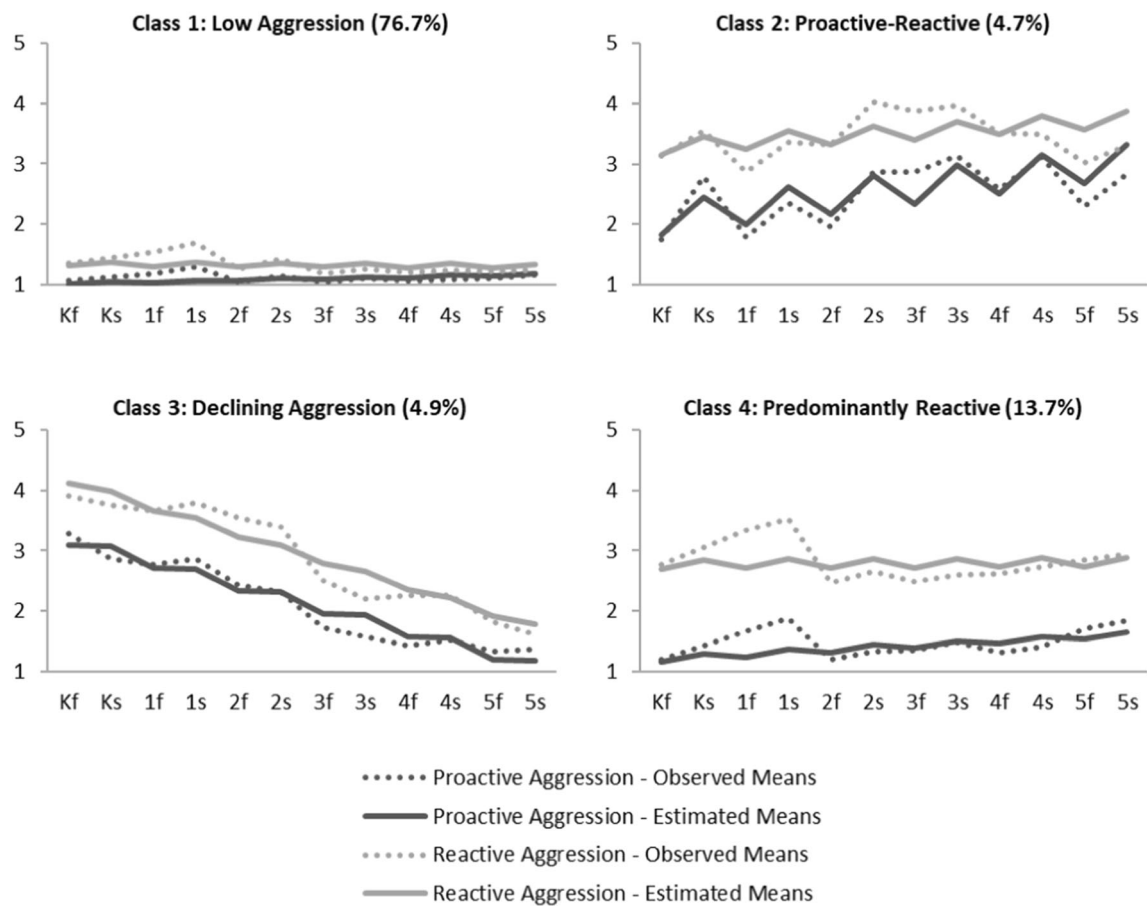
Fig. 1 Trajectories of proactive-reactive aggression latent classes from Kindergarten to 5th Grade. *Note.* Both aggression variables were measured on a scale from 1 (*Never*) to 5 (*Almost Always*). Development over time is represented on the x-axis by grade level (Kindergarten to 5th) and semester (f = fall, s = spring) for all panels. See Table 2 for parameter estimates. Models control for cohort effects.

Table 2 Latent growth terms for final proactive-reactive aggression classes

	Class 1: Low aggression (76.7%)			Class 2: Proactive-reactive (4.7%)			Class 3: Declining (4.9%)			Class 4: Reactive (13.7%)		
	Est	SE	*p*	Est	SE	*p*	Est	SE	*p*	Est	SE	*p*
Proactive aggression												
Intercept	1.09	0.02	<0.001	1.92	0.08	<0.001	3.18	0.18	<0.001	1.24	0.05	<0.001
Linear	−0.01	0.01	0.064	0.12	0.04	0.001	−0.42	0.04	<0.001	0.04	0.02	0.054
Spring	0.06	0.01	<0.001	0.59	0.12	<0.001	0.19	0.13	0.146	0.11	0.05	0.022
Reactive aggression												
Intercept	1.40	0.04	<0.001	3.28	0.23	<0.001	4.20	0.18	<0.001	2.78	0.12	<0.001
Linear	−0.05	0.01	<0.001	0.01	0.08	0.898	−0.49	0.05	<0.001	−0.03	0.04	0.355
Spring	0.09	0.02	<0.001	0.30	0.11	0.010	0.11	0.15	0.476	0.16	0.10	0.103
% Male	46.7			63.1			65.7			75.3		

Values are unstandardized, thus reflecting the original metrics for the measure (1–5) and for time (fall of kindergarten is the intercept, 1-year is the unit of linear change, and average fall-to-spring change is the unit for the spring effect). Because this scale does not include a true zero, *p*-values for the baseline intercept were adjusted to reflect a significant difference from 1 (the measure's floor)

Aggression Trajectories Predicting Psychosocial Outcomes

Figure 2 plots all outcome variable trajectories for a hypothetical average boy in each of the four classes. Table 3 reports the statistical effects of class membership on these trajectories.

Peer Problems As shown in Fig. 2 (Panels a and b), trajectories of peer problems for each class showed similar patterns by child and teacher report. There were differences that might be attributable to informant perspectives, such as teachers reporting uniformly lower peer problems than students. Children in the Low Aggression Class had low levels of peer problems per both informants, with youth-reported peer problems declining slightly over time. Youth in the Proactive-Reactive Class exhibited teacher-reported peer problems that declined slightly and were elevated in 5th grade, and self-reported peer problems increased marginally and were also elevated in 5th grade. Relative to the Low Aggression Class, the Declining Class showed peer problems in 5th grade that were significantly elevated by teacher report, following significant decline, and marginally elevated by youth report, following a normative decline. Finally, the Reactive Class showed stable peer problems by youth report and increasing peer problems by teacher report, both of which were significantly elevated in 5th grade. Interestingly, teacher ratings increased for the Reactive Class but decreased for Proactive-Reactive Class—patterns running opposite to
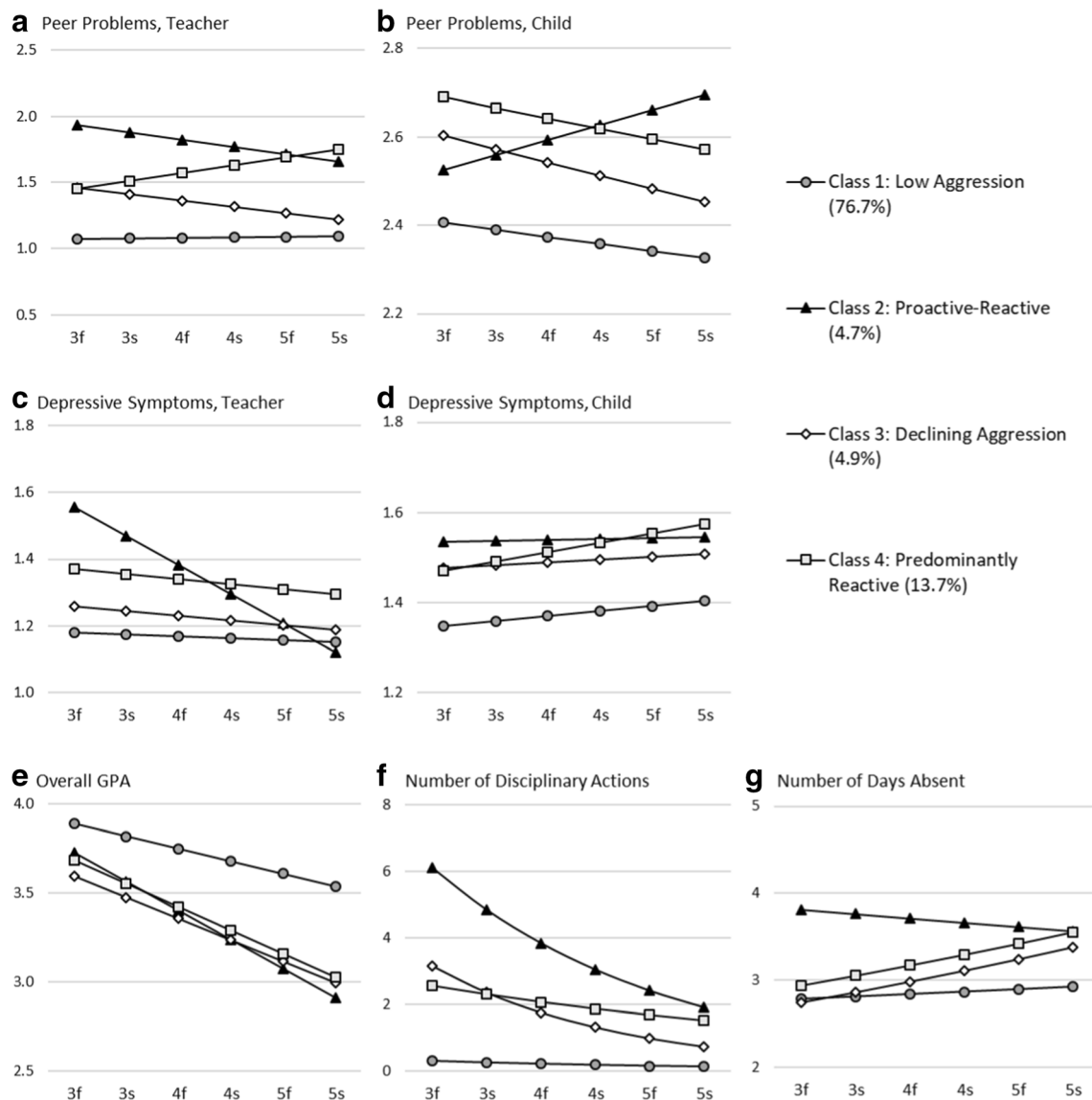
Fig. 2 Social-emotional and school outcomes for youth in each latent aggression trajectory class. *Note.* Dependent variable units are represented on the y-axis, for peer problems (Panels **a** and **b**), depressive symptoms (Panels **c** and **d**), and school outcomes (Panels **e**–

g). Development over time is represented on the x-axis by grade level (3rd to 5th) and semester (f = fall, s = spring) for all panels. See Table 3 for parameter estimates and comparison of aggression (Classes 2–4) to normative (Class 1) trajectories.

Table 3 Class membership predicting social-emotional and school outcomes in 3rd-5th grade

	Peer problems		Depressive symptoms		School records		
	Teacher report	Child report	Teacher report	Child report	Overall GPA	Discipline	Days absent
Latent intercept set at spring of 5th grade							
Reference group (intercept)	1.09 (0.02)***	1.31 (0.03)***	1.19 (0.02)***	1.36 (0.03)***	3.46 (0.04)***	−1.23 (0.15)***	1.01 (0.05)***
Class 2: Proactive-reactive	0.57 (0.12)***	0.37 (0.14)**	−0.04 (0.06)	0.16 (0.15)	−0.61 (0.15)***	2.42 (0.34)***	0.22 (0.15)
Class 3: Declining	0.13 (0.05)*	0.13 (0.08)+	0.03 (0.05)	0.12 (0.10)	−0.52 (0.11)***	1.42 (0.25)***	0.17 (0.15)
Class 4: Reactive	0.66 (0.06)***	0.26 (0.06)***	0.13 (0.04)**	0.19 (0.06)**	−0.47 (0.07)***	2.00 (0.21)***	0.23 (0.09)*
Female (covariate)	0.00 (0.02)	0.04 (0.03)	−0.07 (0.02)**	0.08 (0.04)*	−0.14 (0.04)**	−1.45 (0.18)***	0.12 (0.06)+
Latent linear slope across grades 3–5							
Reference group (intercept)	0.01 (0.01)	−0.03 (0.02)*	−0.01 (0.01)	0.01 (0.02)	−0.16 (0.01)***	−0.21 (0.08)**	0.00 (0.03)
Class 2: Proactive-reactive	−0.12 (0.07)+	0.10 (0.06)+	−0.16 (0.05)***	−0.01 (0.06)	−0.18 (0.07)*	−0.15 (0.19)	−0.04 (0.08)
Class 3: Declining	−0.10 (0.04)*	−0.03 (0.05)	−0.02 (0.03)	0.00 (0.04)	−0.09 (0.05)+	−0.28 (0.13)*	0.07 (0.08)
Class 4: Reactive	0.11 (0.03)**	−0.02 (0.03)	−0.02 (0.02)	0.03 (0.04)	−0.11 (0.03)***	0.07 (0.10)	0.07 (0.04)
Female (covariate)	0.00 (0.01)	0.00 (0.02)	−0.01 (0.01)	0.03 (0.02)	0.04 (0.02)*	−0.25 (0.09)**	0.03 (0.03)

All cells are Est (SE). Reference group is boys in Class 1 (low aggression); all other terms (class and gender effects) indicate the extent to which these variables differ from the reference group. [a] Discipline and days absent data were both count variables analyzed with a negative binomial model; results can be interpreted such that the estimated values of Y reported above represents the log(count), which can be reverse-transformed for interpretability. For example, a boy in Class 1 in the spring semester of their 5th grade year received an estimated average of exp.(−1.23) = 0.29 disciplinary actions. [+] $p < 0.10$, [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$

youth-report. It is possible that teachers are less aware of proactive than reactive aggression. Further, this gap may widen as children get older and proactive aggression becomes more controlled whereas reactive aggression remains uncontrolled.

Depressive Symptoms Teacher- and youth-reported depressive symptoms followed somewhat different growth patterns, possibly due to different scales (see Measures) or occasions (see Table 1). Thus, results are interpreted separately (Fig. 2, Panels c and d). First, teacher-rated depressive symptoms for the Low Aggression Class started and remained low. The Declining Class was not significantly different from this pattern. In contrast, the Proactive-Reactive Class started with high teacher-rated depressive symptoms in 3rd grade, but these declined and by 5th grade did not differ from the Low Aggression Class. Only the Reactive Class started and remained significantly higher in teacher-rated depressive symptoms over 3rd to 5th grade. Regarding self-report, there was a pattern of depressive symptoms starting low and increasing slightly but significantly over time. Relative to this trend, youth in the Proactive-Reactive and Declining Classes were not significantly different in any way. But the Reactive Class showed depressive symptoms that were consistently significantly elevated.

School Outcomes As shown in Fig. 2 (Panels e–g), the Low Aggression Class stood out with high GPAs that declined somewhat over grades 3–5. Relative to this trajectory, youth in the aggressive classes had significantly lower GPAs that

dropped more sharply (although, only marginally so for the Declining Class). In practical terms, this translated to about a half-point lower GPA in 5th grade. Similar intercept results were observed for teacher-rated academic performance (see Supplement 2). The Low Aggression Class had about 0.29 disciplinary actions and 2.73 absences in spring of 5th grade, and only showed a significant slope for discipline, decreasing from 3rd to 5th grade. Relative to these patterns, Reactive and Proactive-Reactive youths showed similar trajectories for disciplinary actions but averaged about two more incidents in their final semester. The Declining Class showed a pattern of decreasing disciplinary actions, ending 5th grade with less than one incident per semester, though still higher than their Low-Aggression peers. Lastly, only the Reactive Class had significantly more absences than the Low Aggression Class. The slope for absences was flat and unrelated to class.

Discussion

Operating from a developmental psychopathology perspective, the present study used a person-centered, multidimensional approach to investigate aggressive behavior in childhood. The results obtained offer several unique contributions to the literature. This is the first study to our knowledge to model trajectories of proactive-reactive aggression in middle childhood *and* their outcomes (prior studies have focused on general aggression, other ages, and antecedents). We identified four latent class trajectories, the properties of which

contribute meaningfully to the developmental psychopathology literature—for example, disentangling typical from atypical, and elucidating the homotypic and heterotypic multifinality of youth aggression. Unlike many prior studies, outcomes were assessed via repeated, multimethod (teacher, youth, records) data, offering a full picture of the peer, affective, and school domains implicated by prior research and theory. Finally, this study provides a new picture of how subgroups of children may follow different trajectories from Kindergarten to 5th grade, including unique findings on aggression's seasonal variations, long-term growth, and outcomes during the pivotal developmental period of early-adolescence. We discuss these results in more detail below, first overall, then for each class, and concluding with implications.

One in four students fell into a trajectory of elevated aggression, with three variations: *Proactive-Reactive* (5%), *Declining* (5%), and *Reactive* (14%). Our four-class solution resonates with the externalizing literature generally, where four-class solutions have been common (e.g., Côté et al. 2007; Givens and Reid 2019; Joussemet et al. 2008; Nagin and Tremblay 1999; Schaeffer et al. 2003; Shaw et al. 2003). There was high within-person correspondence between proactive and reactive, in line with between-person correlations from meta-analyses (e.g., Card and Little 2006; Polman et al. 2007). Also consistent with the literature (Fite et al. 2016), mean levels of reactive aggression were higher than proactive aggression in all classes at all occasions. Overall, results show a highly correlated but asymmetrical distribution of the proactive and reactive subtypes. Substantively, this means *all aggressive classes were reactively aggressive*, with classes distinguishing themselves from there based on the presence of proactive aggression and persistence over time. Notably, and in line with other proactive-reactive trajectory studies (Barker et al. 2006; Cui et al. 2016; Girard et al. 2019), we found no evidence of a proactive-only class. To our knowledge, proactive-only groups have been forced manually (e.g., through median splits or cutoffs; e.g., Day et al. 1992; Dodge and Coie 1987) but not found through more modern statistical methods. Methodologically, these data seem to support the LCGM approach used here, as they would likely violate the bivariate-normal assumptions of more traditional multivariate methods. Thus, this study provides more rigorous person-centered tests of associations that could be missed or distorted in variable-centered models (Evans and Fite 2019).

One intriguing finding was a clear "spring effect" in which aggressive behavior seems to increase in spring semesters relative to the fall. Although seasonality of aggression has been hinted at by prior data (e.g., Pellegrini and Long 2002; Schaeffer et al. 2003) and experience, short-term patterns are not typically specified in growth models concerned with long-term development (Bevilacqua et al. 2018; Moffitt 2008). The spring uptick was especially clear for proactive aggression, both as a variable (seen in most classes) and as a class (i.e.,

Proactive-Reactive). This finding is consistent with prevailing accounts of the proactive vs. reactive functions (Fite et al. 2016). That is, proactive aggression, conceptualized from social learning theory, would be expected to develop over time within a given social context. In contrast, reactive aggression, from a frustration-aggression or emotion regulation perspective, may be more dispositional or temperamental, and therefore less contingent on time of year. Another possibility is that teachers may become more attuned to students' behavior over the school year. Further research is needed to replicate and understand this finding. Whatever the explanation, it may carry implications for identifying children's aggressive behavior throughout the year.

Proactive-Reactive Trajectory Classes and their Outcomes

The large majority (77%) of youths followed a Low Aggression trajectory showing little to no aggressive behavior of either type over grades K-5. Our discovery of this majority is consistent with many prior studies (e.g., Fanti and Henrich 2010; Nagin and Tremblay 1999; Reinke et al. 2012; Silver et al. 2010); however, some studies have instead differentiated multiple subgroups at the low end of the continuum. For example, Girard et al. (2019) found both non-aggressors (34%) and low-stable (27%) groups from ages 6 to 13 based on teacher-rated aggression; and Joussemet et al. (2008) differentiated no-aggression (33%) and stable-low aggression (45%) trajectories. Perhaps when one measures *both* proactive and reactive aggression in *both* fall and spring, the distinction between low vs. no aggressive behavior dissipates. Prior research has been criticized for spurious over-extraction, given that LCGMs can differentiate groups based on trivial within-class variability (e.g., all zeros vs. mostly zeros). Our modeling sequence appears perhaps less vulnerable to this criticism. Class proportions more closely resembled lifetime prevalence of disruptive behavior disorders (Merikangas et al. 2010) than a pattern of splitting into a large number of small subgroups. In line with a developmental psychopathology perspective (Cicchetti and Rogosch 2002), the Low Aggression Class represents a normative group worthy of study and a reference point for examining the more aggressive classes (Cui et al. 2016). Indeed, outcomes for this class were consistently most favorable, with the highest GPAs and lowest problems with depression, peers, discipline, and absences.

Broadly, membership in any of the elevated aggression classes predicted poorer peer, academic, and disciplinary outcomes. Of these classes, the Declining group showed relatively more favorable outcomes by 5th grade, despite starting with the highest levels of reactive and proactive aggression in kindergarten. This finding contrasts with prior studies on trajectories of physical aggression, which have often found a small chronic group with the highest levels of aggression from early

childhood into adolescence; decliners (when they are found) are typically never more aggressive than this group (Broidy et al. 2003; Tremblay et al. 2018). In our results, standard errors of latent intercept terms suggest that this initial difference is significant, but it is not clear whether it is meaningful. One possibility is that this group could represent *slow-to-acclimate* youth, who are dysregulated and aggressive—even more so than the proactive-reactive group—initially upon starting school. Perhaps these children were acquiring self-regulation more gradually compared their peers. In this regard, their pattern could be viewed as a response to intervention, whether explicitly (i.e., some children may have been identified for special services) or implicitly (i.e., in that school represents an "intervention" supporting social-emotional and cognitive development). A related possibility is that this class could overrepresent younger ages relative to grade-mates, a characteristic that has been linked to higher rates of ADHD and relative immaturity (Karlstad et al. 2017). The data do not permit investigation of these questions for this Declining group, but they represent intriguing directions for future work. Still, these youths did face continuing difficulties with peer, academic, and school functioning; but they did not show greater depressive symptoms or absenteeism, and overall tended to draw closer to, not farther from, the Low Aggression reference group.

Youth in the Proactive-Reactive Class showed consistently elevated levels of both aggression types. Interestingly, only their proactive aggression showed significant increases in the long-term accompanied by short-term seasonal increases in both proactive and reactive aggression. The reason for this seasonal effect is an important question for future study, but some possible explanations arise. As noted above, this pattern could reflect the socialization of aggression (Bandura 1978), particularly proactive aggression, both within (spring effect) and across (linear slope) grade levels. These complexities are reflected in their outcomes. This class had higher levels of teacher- and child-rated peer problems, poorer academic performance, and the highest number of disciplinary actions; however, their depressive symptoms and absenteeism were not significantly higher than the Low Aggression Class. Perhaps these youths were not *globally* impaired, as they were not missing more school and were not more depressed than their peers; nonetheless, their outcomes were suboptimal, with peer, behavioral, and academic problems that could go undetected in variable-centered analyses. Over grades 3–5, youth (but not teacher) ratings showed increasing peer problems, and teacher (but not youth) ratings showed decreasing depressive symptoms. Thus, both informants may be needed to obtain a full picture.

The Reactive Class offers some of the clearest and potentially most important findings. Constituting 14% of the sample, these youths were never the most severe in terms of overall aggression. Rather, they began with elevated reactive aggression and limited proactive aggression—a pattern that persisted over 12 semesters. Reactive youths may be chronically emotionally dysregulated and susceptible to feeling frustrated or threatened, consistent with the frustration-aggression account (Berkowitz 1989). In terms of 5th grade outcomes, this Reactive Class showed greater peer problems and depressive symptoms per both informants; and their GPAs, discipline, and absenteeism were all significantly less favorable than the Low Aggression Class. These findings are consistent with literature linking reactive aggression to a host of social, emotional, and educational difficulties (e.g., Card and Little 2006; Fite et al. 2016; Hubbard et al. 2010), and it helps to advance this knowledge from a person-centered perspective. Results may hold broad implications for children who are reactively aggressive and dysregulated (White et al. 2013) being at increased risk for outcomes such as victimization, bullying, and depression. This highlights the need for research to consider aggression in relation to emotional/behavioral dysregulation and various social-emotional outcomes.

Finally, the observed gender distributions were interesting and warrant some comment. Reflecting the youth aggression literature, boys were the majority in all three aggressive classes (Table 2). The gender ratios for the elevated aggression classes roughly correspond to prevalence estimates for disruptive behavior disorders, all of which show male preponderances (Merikangas et al. 2010). We accounted for this by controlling for gender as a within-class covariate in outcome models, with some significant effects on outcomes reported for a full picture (Table 3).

Limitations and Implications

First, this was a school sample with limited diversity, underscoring the need for research in samples with greater racial, ethnic and socioeconomic diversity, as well as in other age ranges and in clinical or at-risk samples. Still, this study contributes to a literature that often has focused primarily on boys and on youth already exhibiting or at risk for aggressive behavior. Second, due to practical constraints, measures were brief and not always collected at occasions (see Table 1). This reflects the realities of our school-university partnership, carrying out the research in the face of funding challenges, teachers' busy workloads, and valuable classroom time. Here too, the multi-method approach is valuable for mitigating these concerns. Third, the accelerated design resulted in planned missing data where most cohorts were not assessed on all 12 K-5 occasions; rather, cohorts were assessed on 4–12 occasions for overlapping periods of 2–6 years, allowing us to maximize the developmental window, sample size, and resource efficiency. Lastly, because LCGM is exploratory, results are not definitive; rather, they offer a glimpse of the subgroups most evident in this sample. Our decision to treat

classes as stable predictors of outcomes ignores the probabilistic nature of class formation (Nylund-Gibson et al. 2019), but seemed appropriate given the high entropy, model complexity, and need for consistency of results across different outcomes—all in line with the pragmatic realities of categorical decision-making based on imperfect data.

Findings offer important implications for research, theory, and practice in developmental psychopathology. These results extend a rich developmental literature on antisocial behavior into the functions of aggression. Consistent with prior research, proactive and reactive aggression, though highly correlated, meaningfully identify youth with different patterns and outcomes. Across complex patterns of associations with outcomes, youths with high-stable reactive aggression may constitute a key at-risk group. A related theoretical implication is the importance of considering both long- and short-term patterns of behavior, as this seems to offer useful connections to theories underlying the etiology and maintenance of aggression. Considering how professionals must adopt a person-centered approach to conceptualization at the individual level (e.g., a student or a patient), these findings can help inform this conceptualization and decision-making. For example, rather than conducting comprehensive social-emotional assessments on only one occasion, schools might benefit from briefer, periodic screenings—including aggression subtype items—administered repeatedly over time (semesters and grade levels) to ensure behavior problems are appropriately identified and addressed. There also seem to be special implications for conducting and interpreting assessments toward the beginning versus toward the end of the school year. More broadly, results add to a growing body of evidence to inform policy and practice that not all aggressive youth are aggressive in the same way. Future research, prevention, and intervention efforts could benefit from adopting more person-centered approaches to youth aggression.

Data Availability   Not applicable.

Compliance with Ethical Standards

Conflict of Interest   The authors declare that they have no conflicts of interest.

Ethics Approval   Approved by the institutional review board at the University of Kansas.

Consent to Participate   Informed consent and assent were collected from participants.

Consent for Publication   All authors have reviewed the manuscript and consented to its publication.

Code Availability   Not applicable.

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