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ORIGINAL PAPER

Parent, Teacher, and Youth Reports on Measures of Reactive and Proactive Aggression

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Abstract

Background More research is needed to improve measurement selection and to better understand informant differences in reports of reactive and proactive aggression.

Objective Toward this goal, the current study evaluated the psychometrics (i.e., reliability, factor structure, and validity) and correlates of two measures of reactive and proactive aggression (i.e., Dodge & Coie, in J Pers Soc Psychol 53:1146, 1987; Raine et al. in Aggress Behav 32:15–171, 2006) across three informants (i.e., parent, teacher, and youth).

Method Parent, teacher and youth reports of measures were collected in a community recruited sample of 9–12 year-old youth ($M = 10.44$; 56% male).

Results Both measures demonstrated adequate to good internal consistency by parent- and teacher-report, and borderline to adequate internal consistency by youth-report. Additionally, aggression subscales were correlated within and across measures and informants, and an appropriate 2-factor structure was identified for both measures across informants. Consistent with prior research, reactive aggression was more robustly associated with depression symptoms and effortful control than proactive aggression across measures, but there were some links with proactive aggression.

Conclusions Overall findings suggest that both measures are psychometrically appropriate to use with parents, teachers, and youth. However, there were distinctions between the two measures, and relying solely on youth reports in this age group is not recommended. Further, there are unique associations evident with various informants, supporting the need for multiple informants when assessing functions of aggression in youth.

Keywords Proactive aggression · Reactive aggression · Informant differences · Child

Introduction

Aggression, or acts intended to injure or harm another individual, is a major concern among youth and is associated with serious consequences for both the aggressor and their victim (e.g., Fite et al., 2016b). However, the difficulties associated with aggression

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oftentimes depend on the motivation behind the behavior, suggesting the need to distinguish between reactive and proactive functions of aggression (e.g., Fite et al., 2016b). Current research and clinical practice include the use of various aggression measures with various informants providing the responses, which may help to explain inconsistent findings in the aggression literature. Unfortunately, little research has evaluated the psychometric properties of measures of reactive and proactive aggression across informants, and limited research has examined associations between measures of reactive and proactive aggression within and across informants. These are notable omissions in the literature, as this information will help us better understand the best way to assess the functions of aggression, better understand informant differences in the reporting on these functions of aggression, and to better understand their links with adjustment difficulties. The current study addresses these gaps by evaluating the psychometrics (i.e., reliability, factor structure, and validity) and correlates of two measures of reactive and proactive aggression (i.e., Dodge & Coie, 1987; Raine et al., 2006) across three informants (i.e., parent, teacher, and youth) in a sample of late childhood age youth (i.e., 9–12 years old).

Reactive and Proactive Functions of Aggression

Aggression is commonly subtyped by the function or motivation of the aggressive act, specifically proactive versus reactive aggression (Card & Little, 2006; Fite et al., 2016b). Although strongly correlated and often co-occurring (Fite et al., 2023), these functions of aggression are distinct. Reactive aggression is emotionful, impulsive, and often retaliatory in nature and is understood through the frustration-aggression model (Berkowitz, 1993). Proactive aggression, in contrast, is planful and goal-oriented (Dodge & Coie, 1987) and is understood through social learning theory (Bandura, 1973). Consistent with this theory, individuals learn through modeling and reinforcement. Both types of aggression are related to different maladaptive social information processing steps (SIP; Crick & Dodge, 1994, 1996), such that reactive aggression is related to encoding and interpreting hostility in others (hostile attribution bias) which occurs in the early steps, wherein proactive aggression is related to evaluating aggressive responses positively which occurs in the later steps.

Measurement of Functions of Aggression Across Informants

Collecting data from multiple informants increases the validity and clinical utility of psychological measurements (for a review see De Los Reyes et al., 2015; Mildrum Chana et al., 2020); however, researchers often struggle with selecting measures that are both valid and concise. Teacher-, parent-, and youth-reports consistently demonstrate informant discrepancies across a variety of domains (e.g., conduct problems, mood; De Los Reyes et al., 2015; Mildrum Chana et al., 2020). However, researchers have struggled to conceptualize informant discrepancies—often leading to inconsistent conclusions and researchers using measurement error and informant biases to explain findings (De Los Reyes et al., 2015). Findings are typically considered more robust when informant reports correspond and draw consistent conclusions, and when informants differ, clinicians and researchers tend to draw conclusions by valuing one informant's report over another's (e.g., a parent's report over a youth's; De Los Reyes et al., 2015). However, De Los Reyes et al. (2015) highlights that the multi-informant approach is valuable *because* informants have unique

and valid perceptions. The Operations Triad Model (OTM; De Los Reyes et al., 2013) states that informants tend to differ from one another in predictable ways, and, when informants differ, they differ for meaningful reasons, such as context, covertness, and/or measurement characteristics (De Los Reyes et al., 2015).

Informant discrepancies across youth, teachers, and parents are evident with aggressive behavior (De Los Reyes & Kazdin, 2005; Jensen et al., 1999); however, the reasons for these discrepancies are not well understood. Existing research indicates that the aggression function assessed (i.e., proactive or reactive) impacts informant discrepancies for youth in middle to late childhood (Midrum Chana et al., 2021; Barhight et al., 2017). When comparing youth-reports to parent/teacher reports, youth-reports of reactive aggression correspond—albeit modestly—with teacher- and parent-reports; however, youth self-reports on proactive aggression do not correspond with teacher or parent reports (Midrum Chana et al., 2021; Fite et al., 2016a; Barhight et al., 2017). This may be because proactive aggression is more covert or because youth have different perceptions of the cognitive motivations for their behavior (Barnes et al., 2012; Cross et al., 2009; De Los Reyes et al., 2015; Rieffe et al., 2016). Alternatively, work evaluating discrepancies across aggression functions for non-youth informants (e.g., parents vs. teachers) is mixed. Ollendick et al. (2009) found that parent and teacher reports of aggression modestly corresponded for both reactive ($r=0.38$) and proactive ($r=0.32$) functions, while Barhight et al. (2017) found parent and teacher reports of reactive aggression were modestly correlated ($r=0.26$) but reports of proactive aggression were not (nonsignificant). Teachers' and parents' reports may differ because youth behave differently at school and home (De Loys Reyes, 2015); however, further research is needed to understand why correlations with reactive aggression are modest and findings regarding proactive aggression are mixed. While Ollendick et al. (2009) and Barhight et al. (2017) used nearly identical measures for teachers and parents within their studies, the measures differed between studies. Measurement characteristics can substantially impact informant discrepancies (De Los Reyes et al., 2015) and therefore may play an important role in explaining these mixed findings. We were unable to identify any research that compared teacher and parent reports of aggression functions with multiple measures; therefore, it is unclear how measurement characteristics influence teacher and parent reports of aggression.

Late childhood (i.e., 9–12 years old) is an ideal developmental period in which to explore discrepancies in aggression reports because (1) it marks the biggest spike in aggressive behavior since toddlerhood (for a review see Fite et al., 2023), (2) youth can insightfully report on their own behavior (Mildrum Chana et al., 2020), and (3) while youth have increased independence, they are still in settings where their behavior is easily observed by adults. From a statistical perspective, the higher base rate of aggressive behavior in late childhood youth is valuable for discrepancy research because it increases the variability of participants engaging in aggression, allowing for more robust statistical analyses and better exploration of the driving forces (e.g., correlates) behind discrepancies with reporters. Additionally, youth insight on their own behavior is important because youth and adults may have genuinely different perceptions of youth aggression (De Los Reyes et al., 2015; Kupersmidt & Patterson, 1991; Tomada & Schneider, 1997). Youth-reports of aggression in middle to late childhood are lower than teacher/parent reports (Epkins, 1993; Johnson & Hannon, 2014; Ledingham et al., 1982). It is possible that this is due to social desirability bias from youth; however, this discrepancy may also occur because youth view their aggressive behavior as more developmentally normative (and therefore less severe) than adults because aggression is so common at this age (Fite et al., 2023). Alternatively, parents and teachers may bring their own biases into reporting based on how they view

aggression compared to their other children, the youth's behavior at a younger age, or classroom dynamics (De Los Reyes et al, 2015). Finally, late childhood youth are often still closely observed by parents and teachers at home and at school and therefore they can provide valuable information on how youth behave. However, reports across informants are more similar for younger children than older ones (De Los Reyes et al., 2015) and further work is needed to understand why non-youth informants are more discrepant as youth age.

Unfortunately, there has been remarkably little research on why discrepancies occur across informants for aggression. An essential first step in understanding differences in informant reports is a thorough evaluation of the psychometric properties of aggression measures. A better understanding of the validity of aggression measures across informants would help researchers determine whether some informants are more "valid" reporters of aggression or whether informants are equally valid, with discrepancies merely representing different perspectives. Further, a better understanding of how construct and concurrent validity differs across different measures would aide researchers in both measurement selection and the meaning of informant discrepancies, as this would provide insight into which measures are most appropriate for specific informants (De Los Reyes et al., 2015, 2022). However, evaluating these differences requires research utilizing a multi-informant and multi-measurement approach for youth.

Two commonly used (and psychometrically sound) measurements for teacher-, parent-, and youth-report of aggression functions are Dodge and Coie's (1987) Proactive and Reactive Aggression Measure (referred to as D&C) and Raine et al. (2006) Reactive-Proactive Aggression Questionnaire (referred to as Raine). The Dodge &Coie (1987) has 6 items and was originally developed as a teacher-report measure; meanwhile, Raine et al., (2006) has 23 items and was originally developed as a youth-report measure. While both measures have demonstrated sufficient reliability and validity in prior studies, each measure offers unique advantages: the D&C is substantially more concise; however, Raine has stronger internal consistencies across parent, teacher, and youth informants (Abel et al., 2020; Baker et al., 2008; Fite et al., 2009, 2012; McAuliffe et al., 2006; Rathert et al., 2011). However, neither measure has been evaluated using parent-, teacher-, and youth-report simultaneously. An evaluation of the psychometric properties and correlates of D&C and Raine measures across parent, teacher, and youth informants would provide valuable insight into informant discrepancies and guidance on selecting concise and valid measurements in multi-informant work.

Correlates of Reactive and Proactive Aggression

Consistent with different theoretical frameworks, research supports distinct correlates for reactive and proactive functions of aggression (Fite, et al., 2016b, Fite et al., 2023). When evaluating associations across informants it is important to examine both internalizing and externalizing adjustment correlates to determine what types of behaviors are distinguished between proactive and reactive aggression for various informants. In late childhood, symptoms of depression and effortful control are salient concerns for youth. Both symptoms of depression and effortful control have been uniquely linked with proactive and reactive aggression, likely as a result of self-regulation underpinnings (Fite et al., 2023). However, associations may depend on the informant (Abel et al., 2020; Fite et al., 2012; Rathert et al., 2011; Sontag et al., 2011). It is generally accepted that depression is more strongly linked to reactive aggression than proactive aggression, perhaps because reactive

aggression is characterized by emotion dysregulation (Fite et al., 2016b). Indeed, studies that utilized teacher-reports of aggression found that depression symptoms were associated with reactive, but not proactive, aggression (Fite et al., 2012; Preddy et al., 2014; Vitaro et al., 2002). When studies use youth-report, however, links between aggression functions are mixed: while Fite et al. (2009) found that only reactive aggression was associated with negative affect, Abel et al. (2020) found that only proactive aggression was associated with depression symptoms. Additionally, multiple studies have found that youth-reported proactive and reactive aggression were both linked with depression (Bilgiç et al., 2017; Rieffe et al., 2016). Surprisingly few studies have examined associations of depression with parent-reported aggression; however, White et al. (2013) found that parent-reported reactive, but not proactive, aggression was associated with internalizing problems in youth. Thus, while reactive aggression is robustly linked to depression symptoms, proactive aggression may be more strongly associated with depression than previously thought. Thus, there is a need for further research to understand how associations between aggression and depression vary by informant and by measure.

Similarly, links between effortful control and aggression functions may depend on the informant. Effortful control refers to the ability to manage emotions, behaviors, and attention via inhibiting impulsive responses (Rueda, 2012). Researchers have argued that reactive aggression is linked to low effortful control because it is characterized by poor emotion regulation and response inhibition, while proactive aggression is linked to high effortful control because it is planful (Frick & Morris, 2004; Rathert et al., 2011). Consistent with this view, Rathert et al. (2011) found that parent-reported effortful control was negatively associated with teacher-reported reactive, but not proactive, aggression in late childhood. However, additional research in middle to late childhood using parent-, teacher—and youth-report found that low effortful control was associated with both proactive and reactive aggression (González-Peña et al., 2013; Sontag et al., 2011; Xu et al., 2009). Findings may indicate that both functions of aggression are characterized by difficulties inhibiting aggressive behavior. Additional research utilizing multi-informant and multiple assessment tools is needed to clarify associations.

Current Study

Aggression is a common concern among youth; however, our understanding of how to accurately assess reactive and proactive functions of aggression and their associations with other difficulties is limited. The current study advances the aggression literature by evaluating the psychometrics (i.e., reliability, factor structure, and validity) and associations between two measures of reactive and proactive aggression (i.e., Dodge & Coie, 1987; Raine et al., 2006) across three informants (i.e., parent, teacher, and youth) in late childhood, an age in which many youth experience difficulties.

Based on prior research and theory, it was anticipated that all three informants across both measures would produce adequate to good internal consistencies and provide acceptable fit to a correlated 2-factor model of aggression (i.e., proactive and reactive aggression). However, given that the Raine measure has more items, the internal consistencies and factor structure model fit of this measure were expected to be slightly better than the D&C measure. We also anticipated that proactive and reactive aggression would be strongly correlated within and across measures, particularly within informant, given that these aggression subtypes commonly co-occur (Fite et al., 2016b). Agreement across informants was

expected to be strongest between youth and other informants given that youth perspectives would overlap more with parents and teachers than teachers and parents would overlap with one another. Reactive aggression was expected be more robustly associated with depression symptoms and low effortful control than proactive aggression across informants (Fite et al., 2016b); however, some associations between proactive aggression and these correlates of aggression are expected given the high overlap in proactive and reactive aggression.

Method

Participants

Participants included 89 children (male: $N=50$, female: $N=39$) aged 9–12 ($M=10.44$; $SD=1.14$) and their primary parents (85% mothers) recruited from the community via flyers at daycares, recreation centers, pediatricians' offices, and local restaurants across different neighborhoods known to represent different socioeconomic statuses, in the Southeastern United States. Participants completed a preliminary telephone-based screening with a research assistant to ensure eligibility requirements were met (e.g., English speaking and no known developmental delays). The demographics of the children were as follows: White (74%), African American (20.5%), biracial or "other" racial/ethnic group (5.5.%). Participants attended > 25 schools across the community and reported an annual income between $5,600 and 240,000 (median = $50,000), and 27% of the sample reported receiving public assistance.

Teacher-report data were also obtained ($N=69$). Of the 89, 6 were homeschooled, and 1 refused to sign a release of information (ROI) for the researchers to contact their schoolteacher, leaving 82 teachers who were contacted. Of these, 69 teachers returned the study materials. We compared those with and without teacher data and these individuals did not differ on gender or race ($X^2=0.00$, $p=0.98$, and $X^2=0.81$, $p=0.37$) nor age, income, depression, or effortful control ($ts=$ -1.50, 0.96, 0.04, 0.94, $ps>0.07$) respectively, suggesting that the subsample of those with teacher data is representative of the entire sample.

Procedure

Parental consent and child assent were obtained for all participants, and the study was approved by the researchers' institutional review board. Children and their parents attended separate but simultaneous data collection sessions (~ 1.5 h.) at the university laboratory. After consent/assent procedures, the study staff administered all questionnaires interview-style to children and parents and recorded their responses to ensure comprehension and reduce missing data or careless responding. Both the D&C and the Raine measures have been previously used in a similar interview format across community (Baker et al., 2008; Fite et al., 2008) and clinical populations (Connor et al., 2004; Pechorro et al., 2017). Children also completed computerized tasks that were not relevant to the current investigation. At this appointment, parents signed a release of information (ROI) to contact teachers. Teacher packets were mailed to respective schools with a copy of the ROI and a consent form for participation. Parents were compensated $45, teachers a $10 gift card, and children were given a small prize (~ $5 in value). This study was not preregistered. Study materials and data are available upon request to the first author.

Measures

Aggression

Proactive and reactive aggression were assessed using youth, parent, and teacher reports across the following two scales. Internal consistencies of these aggression scales in the current sample are reported in the results.

The Proactive and Reactive Aggression Questionnaire (Dodge & Coie, 1987; referred to in the current investigation as the "D&C" scales for clarity) is a reliable and valid measure that was originally created as a teacher report for elementary aged children and includes six items. Three items assess each aggression subtype. Across reporters, the items are the same (e.g., "When I have been teased or threatened, I get angry easily and strike back (youth), "When my child has been teased…" (parent), and "When _____ has been teased…" (teacher). The measure is on a five-point Likert scale (1 = *never*, 5 = *almost always*). Higher scores indicate higher levels of aggressive behavior.

Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006; referred to in the current investigation as the "Raine" scales) has 23 total items, 12 measuring proactive aggression (e.g., "Taken things from other students"), and 11 measuring reactive aggression (e.g., "Yelled at others when they have annoyed you."). The RPQ was originally created and validated for teenagers, though has been found to be reliable and valid across other age ranges (Fung et al., 2009). Across reporters, the items are the same. The RPQ is on a three-point Likert scale (1 = *never*, 2 = *sometimes*, 3 = *often*). Note, the teacher measure was originally scored 0–2 but was recoded to 1–3 for the current study to be consistent with the D&C scales. Higher scores indicate higher levels of aggressive behavior.

Depression

Children's depression symptoms were assessed using the youth-report of the 27-item Children's Depression Inventory (CDI; Kovacs, 1985). The CDI displays three sentences per item. Children must select one sentence that best fits their experience in the last six months, and scores are coded (0–2), with higher scores indicating higher levels of depression. Average raw scores, rather than T-scores, were computed and used in analyses to provide increased variability (Achenbach 1991). Internal consistency for the current sample was good ($\alpha = 0.86$).

Parents also reported on their child's depression symptoms using the eight-item "Withdrawn Depression" subscale of the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1991). The CBCL asks parents to reflect on their child's behavior in the last six months and provides three response options (1 = *Not True*, 2 = *Somewhat/Sometimes True*, and 3 = *Very or Often True*), with higher scores indicating higher levels of depression. Per recommendations, the raw mean score, rather than T-scores, were used in analyses (Achenbach & Rescorla, 2001). Internal consistency for the current sample was adequate ($\alpha = 0.74$).

Effortful Control

Children's effortful control was assessed using parent and teacher reports on the 39-item Effortful Control scale of the Child Behavior Questionnaire (Rothbart et al., 2001). The

scale is comprised of three subscales, including inhibitory control (e.g., "Is usually able to resist temptation when told s/he is not supposed to do something"), attention focusing (e.g., "Is easily distracted when listening to a story") and attentional shifting (e.g., "Has a hard time shifting from one activity to another"). Parents and teachers responded using a 7-point Likert scale (1 = *Extremely untrue*, to 7 = *Extremely true*) to rate how untrue/true each statement was. Mean scores were computed and used for analyses, with higher scores indicating higher levels of effortful control. Internal consistencies for both parent and teacher reports in the current sample were adequate ($\alpha = 0.75$ and 0.71 respectively).

Analytic Plan

First, we examined distributional and reliability characteristics of the data, with particular attention to proactive and reactive aggression scales across measures and informants (Y = Youth; P = Parent; T = Teacher). Reliability was considered via three metrics: (a) Cronbach's alpha, for traditional internal consistency, interpreted following Mash and Hunsley's (2008) rubric; (b) McDonald's omega, which is comparable to but recommended over alpha because it does not assume tau equivalence (McNeish, 2018); and (c) mean inter-item correlations, which, unlike alpha and omega, are not biased by the number of items in a scale, and values greater than approximately 0.30 are considered good (Streiner et al., 2015). The univariate characteristics of the data at the scale-level and item-level revealed some features of the data (e.g., items with limited variance) that would need to be addressed in subsequent models.

Second, bivariate correlations were examined to understand patterns of aggression associations across scales and informants. Given the varied distributional properties of the data, we examined correlations as both Pearson's *r* and Spearman's rho coefficients. Results are interpreted with an emphasis on effect size, with thresholds of 0.10, 0.30, and 0.50 corresponding to small, medium, and large correlations, respectively (Cohen, 1988a, 1988b). We used 95% confidence intervals (CIs) around correlations for inferences and $p < 0.05$ for significance.

Third, confirmatory factor analysis (CFA) models were estimated for both aggression measures per all three informants; these analyses are described in detail in the following section. Finally, associations with depression and effortful control were examined through within-informant correlations. Factor analyses were conducted in Mplus Version 8 and all other analyses in SPSS Version 27. Regarding missingness, data availability (see Table 1; out of $N = 89$) was lowest for teachers (70–78%), near perfect for youths (97–100%), and perfect for parents (100%). Full information maximum likelihood estimation was used to handle missingness in CFAs except for those estimated with WLSMV, which uses a pairwise approach (Asparouhov and Muthen, 2010). Listwise approaches were used in descriptive analyses.

Factor Analyses

A series of CFA models were estimated—not with the goal of evaluating and changing these scales' established measurement structure, but to descriptively evaluate the fit of the proactive–reactive structure of the measures in this particular sample. We selected estimators appropriate for the characteristics of the measures and the data: robust maximum likelihood (MLR) for the 5-point Likert scale of Dodge and Coie (1987), and robust weighted least squares (WLSMV) for the 3-point ordinal scale of the Raine et al. (2006) and for

Table 1 Proactive/reactive aggression scale reliability results

Scale and Informant	*N*	Items	Cronbach's α	McDonald's ω	*M* Inter-Item *r*
Dodge & Coie Measure					
Parent proactive	89	3	0.87	0.89	0.69
Parent reactive	89	3	0.79	0.79	0.57
Youth proactive	88	3	0.61	0.66	0.43
Youth reactive	89	3	0.66	0.70	0.39
Teacher proactive	69	3	0.94	0.94	0.84
Teacher reactive	69	3	0.91	0.91	0.78
Raine et al. *Measure*					
Parent proactive	89	12	0.78[a]	0.80[b]	0.25[a]
Parent reactive	89	11	0.87	0.88	0.38
Youth proactive	87	12	0.69	0.68	0.18
Youth reactive	86	11	0.78	0.77	0.25
Teacher proactive	62	12	0.84[c]	0.85[c]	0.38[c]
Teacher reactive	62	11	0.94	0.94	0.59

[a]Based on 11/12 items; estimated after item 9 dropped due to zero variance. [b]Based on 10/12 items; estimated after dropping items 9 (zero variance) and 18 (negative scale correlations). [c]Based on 10/12 items; estimated after dropping items 9 and 21, both due to zero variance

dichotomized items. Both estimators are at least moderately robust to non-normality. We examined the correlated 2-factor model fit overall, relative to a 1-factor model, and after any needed adjustments. Due to the small sample size, item-level characteristics of the data, and differences between scales, some modifications were needed. To do this we adopted an overall modeling strategy that aimed to adhere to the original measure properties, follow characteristics of the data, and promote comparability of models across informants. For example, some non-convergence issues were handled by dropping items with low variance and by dichotomizing (floor vs. non-floor) item responses to simplify the estimation. These particular details are reported in the results where relevant.

Model fit was evaluated following standard approximate guidelines (not as strict cutoffs): CFI and TLI considered good at ≥ 0.95 and acceptable at ≥ 0.90; and RSMEA and SRMR considered good at ≤ 0.05 and acceptable at ≤ 0.10 (Browne & Cudeck, 1992; Kline, 2023; Little, 2013; Shi et al., 2018). Little (2013) emphasizes the need for flexibility in real data applications in that not all indices have to fall above all cutoffs, e.g., CFI and TLI values around 0.85–0.90 are considered "mediocre fit" (Little, 2013). Further, RMSEA has been shown to be biased toward poorer fit when *N* and *df* are low (Kenny et al., 2015). We interpret RMSEA using its 90% confidence interval as a test of whether to reject the null hypothesis of "good" or "acceptable" fit (Little, 2013). For instance, a model with a high RMSEA (estimate > 0.10) can be interpreted as "failing to reject the assumption of good fit" if its 90% CI lower bound crosses below 0.05. Tests of invariance across informants could not be estimated without a high rate of nonconvergence and inadmissible solutions, given the sample size. Chi-square tests to compare nested models (1 vs. 2 factor) were made using the Satorra-Bentler adjustment for MLR models and DIFFTEST command for WLSMV models (Muthen and Muthen, 2017).

Individual parameter estimates were interpreted primarily through standardized estimates and correlations. Effects-coded unstandardized estimates are reported in the

supplement. When any model fit indicator fell below the guidelines for "good" and "acceptable" as described above, we reviewed all modification indices to identify local sources of misfit and possible re-specifications. Specifically, we inspected modification indices > 10, a conservative threshold selected by Muthen and Muthen (2017) as the Mplus default for consideration of specific changes. Model respecification decisions were guided by rational considerations (Kline et al., 2023), with an eye toward retaining the established measure structure and comparability across informants when possible.

Results

Descriptive Statistics and Scale Reliability

Scale reliabilities for aggression measures are presented in Table 1. Descriptive statistics reported at the scale level in Table 2 and at the item level in Table 3. Consistently across informants and measures, proactive aggression showed a kurtotic right-skewed distribution (skewness = 2.05 to 4.15, kurtosis = 3.67 to 21.72) whereas reactive aggression more closely approximated a normal distribution (skewness = 0.24–1.61; kurtosis = − 0.55–1.71). Mean and median values for all scales consistently fell near or at the measure's floor. Average levels of reactive aggression averages were always higher than average levels of proactive aggression, consistently across all informants and scales; these differences were significant with medium to very large effect sizes (paired sample *t*s = 5.78–19.60, *p*s < 0.001, *d*s = 0.70–2.08).

This result suggests that reactive aggression is somewhat more common, and more commonly observed across settings, than proactive aggression. Item-level response distributions were similar (see Table 3). A few items on the Raine proactive scales were found to have limited variance in the response distribution, with two showing 100% of responses falling at the scale floor (1 = *Never*) per parent-report (item 9) and teacher-report (items 9 and 21); these are addressed in subsequent analyses. In contrast to univariate distribution differences related to scales (proactive vs. reactive) and measures (Raine vs. D&C), there were very few differences related to informant (parent, youth, and teacher).

Internal consistency estimates (see Table 1) were good to excellent for all teacher-rated scales (alphas = 0.84–0.94), adequate to good for parent-rated scales (alphas = 0.78–0.87), and borderline to adequate for youth-report (alphas = 0.61–0.78), with youth-report D&C reactive being the only scale falling below 0.65 (alpha = 0.61). These results were similar across scales and when using omega. However, on *M* inter-item correlations, the D&C scales, with just 3 items per scale, show consistently good reliability (*M* Inter-Item *r* range = 0.39–0.78) whereas the Raine measure varied: higher for parent reactive and both teacher scales (*M* inter-item *r*s = 0.38–0.59) and lower for parent proactive and both youth scales (*r*s = 0.18–0.25). This suggests that some Raine items are weakly correlated with the scale construct, but this was less of a problem for D&C (see corrected item-total correlations in Tables S1 and S2). Regarding the lower alpha values for youth-report, in most cases the removal of any single item would lead to negligible change (within alpha ± 0.05 points) or reduced internal consistency. The one exception was youth-report D&C item 5 (uses force), which was dragging down the alpha for the youth reactive scale (Table S1); however, removing this item would be inadvisable for reasons including changing an established scale, reduced precision of a 2- versus 3-item scale, and losing the parallel content across informants. To summarize, Raine and D&C both showed acceptable internal

Table 2 Characteristics of proactive/reactive aggression data across 3 informants and 2 measures

	1	2	3	4	5	6	7	8	9	10	11	12
1. D&C parent pro	–	.42**	.24*	.18	.18	.12	.57**	.57**	.13	.34**	.27*	.15
2. D&C parent rea	.56**	–	.18	.25*	.35**	.32**	.61**	.74**	.15	.44**	.40**	.32**
3. D&C youth pro	.08	-.03	–	.24*	.38**	.17	.14	.24*	.50**	.36**	.22	.24*
4. D&C youth rea	.17	.24*	.36**	–	.25*	.22	.28**	.28**	.56**	.60**	.25*	.28*
5. D&C teacher pro	.15	.41**	.20	.25*	–	.73**	.30*	.28*	.38**	.24	.81**	.69**
6. D&C teacher rea	.21	.42**	.18	.31**	.79**	–	.21	.21	.19	.14	.73**	.75**
7. Raine parent pro	.82**	.69**	.00	.25*	.36**	.36**	–	.66**	.13	.36**	.32**	.25*
8. Raine parent rea	.59**	.78**	.09	.29**	.34**	.34**	.70**	–	.18	.49**	.35**	.32**
9. Raine youth pro	.10	.07	.70**	.59**	.37**	.29*	.08	.17	–	.59**	.31**	.26*
10. Raine youth rea	.30**	.43**	.29**	.59**	.21	.20	.29**	.49**	.55**	–	.21	.26*
11. Raine teacher pro	.21	.42**	.08	.16	.92**	.71**	.38**	.35**	.29*	.17	–	.73**
12. Raine teacher rea	.20	.42**	.14	.31*	.81**	.88**	.38**	.39**	.31**	.28*	.76**	–
N	89	89	89	89	69	69	89	89	89	89	69	69
Mdn	1.00	2.00	1.00	1.67	1.00	1.67	1.00	1.64	1.08	1.64	1.00	1.10
M	1.22	2.10	1.11	1.79	1.42	1.99	1.11	1.73	1.12	1.66	1.11	1.34
SD	0.58	0.92	0.32	0.68	0.83	1.10	0.18	0.39	0.17	0.33	0.22	0.47
Possible range	1–5	1–5	1–5	1–5	1–5	1–5	1–3	1–3	1–3	1–3	1–3	1–3
Observed range	1–5	1–5	1–3.00	1–3.67	1–4.00	1–5	1–2.08	1–2.73	1–1.83	1–2.64	1–1.92	1–2.67
Skewness	4.15	0.79	4.01	0.61	2.13	1.15	2.64	0.61	2.05	0.24	2.38	1.61
Kurtosis	21.72	0.23	18.14	−0.55	3.67	0.30	9.64	−0.16	4.69	-0.35	4.93	1.71

Pearson's *r* correlations are reported below the diagonal, Spearman's ρ correlations above. See supplemental files for all coefficients with 95% confidence intervals and p-values. D&C = Dodge and Coie's (1987) measure, with 6 items rated on a 5-point scale. Raine = Raine et al.'s (2006) 23-item measure, with 23 items rated on a 3-point scale, pro = proactive aggression, rea = reactive aggression. Both measures are parallel across informants. Results are based on standard scoring, with mean scores computed from all items in each scale. $^{*}p < .05$, $^{**}p < .01$

Table 3 Item content and item-level distributions

	Measure and Item	Scale	Parent	Youth	Teacher	
Dodge & Coie (percentages endorsing: 1 Never—2 Very Rarely—3 Sometimes—4 Often—5 Almost Always)						
1	When my child has been teased or threatened, he/she gets angry easily and strikes back	Reactive	37-36-20-3-3	26-45-22-4-2	39-35-10-10-6	
2	My child always claims that other children are to blame in a fight and feels that they started the trouble	Reactive	27-16-33-16-9	49-20-26-4-0	46-20-14-12-7	
3	When someone accidentally hurts my child (such as bumping into him/her), s/he assumes that the peer meant to do it and then reacts with anger/fighting	Reactive	62-17-16-4-1	73-18-6-3-0	57-23-10-9-1	
4	My child gets other kids to gang up on somebody that s/he does not like	Proactive	88-9-2-1-0	97-2-1-0-0	74-17-4-4-0	
5	My child uses physical force (or threatens to use physical force) in order to dominate other kids	Proactive	85-7-4-2-1	90-7-3-0-0	77-13-1-6-3	
6	My child threatens or bullies others in order to get his/her own way	Proactive	85-10-3-0-1	90-8-1-1-0	77-10-7-6-0	
Raine et al. *(percentages endorsing: 1 Never—2 Sometimes—3 Often)*						
1	Yelled at others when they have annoyed them	Reactive	8-70-22	17-64-19	54-37-9	
3	Reacted angrily when provoked by others	Reactive	18-66-16	38-52-10	59-30-10	
5	Gotten angry when frustrated	Reactive	11-65-24	15-64-21	58-33-9	
7	Had temper tantrums	Reactive	48-38-13	40-46-13	84-7-9	
8	Damaged things because he/she felt mad	Reactive	76-18-6	71-29-0	93-6-1	X
11	Became angry or mad when they didn't get their way	Reactive	20-62-18	33-61-6	68-22-10	
13	Gotten angry or mad when they lost a game	Reactive	26-61-13	44-49-7	74-22-4	
14	Gotten angry when others threatened him/her	Reactive	37-53-10	27-52-20	67-28-6	
16	Felt better after hitting or yelling at someone	Reactive	78-21-1	84-11-4	87-10-3	
19	Hit others to defend him or herself	Reactive	55-42-3	52-38-10	84-13-3	
22	Gotten angry or mad or hit others when teased	Reactive	52-44-4	67-30-2	71-22-7	
2	Had fights with others to show who was on top	Proactive	75-22-2	71-22-7	85-10-4	
4	Taken things from other students	Proactive	91-7-2	92-8-0	82-16-1	X
6	Vandalized something for fun	Proactive	96-3-1	93-6-1	96-3-1	
9	Had a gang fight to be cool	Proactive	100-0-0	97-3-0	100-0-0	X
10	Hurt others to win a game	Proactive	96-4-0	93-6-1	96-4-0	X
12	Used physical force to get others to do what they want	Proactive	84-13-2	85-15-0	87-13-0	X
15	Used force to obtain money or things from others	Proactive	97-3-0	98-2-0	97-3-0	X

Table 3 (continued)

	Measure and Item	Scale	Parent	Youth	Teacher	
17	Threatened and bullied someone	Proactive	78-21-1	82-17-1	78-20-1	
18	Made obscene phone calls for fun	Proactive	97-3-0	81-17-2	98-2-0	X
20	Gotten others to gang up on someone else	Proactive	98-2-0	93-7-0	91-7-1	X
21	Carried a weapon to use in a fight	Proactive	98-2-0	99-1-0	100-0-0	X
23	Yelled at others so they would do things for him/her	Proactive	71-24-6	83-16-1	84-14-1	

Estimates are based on the valid percent responding within each response bin for each item. X = dropped in 14-item Raine models

consistency, with variations across informants (T > P > Y) more than constructs (proactive vs. reactive), and performance on different reliability metrics varying by scale length (Raine 11–12 items vs. D&C 3 items per scale).

Bivariate Correlations

Correlations were inspected with attention to patterns across different measures (D&C, Raine), different informants (P, Y, T), and specific scales (proactive, reactive) present on both measures and thought to be corresponding across measures and informants. The overall pattern was largely similar for Pearson's and Spearman's rho correlations, so we focus on Pearson's for simplicity and for consistency with much of the literature. Correlations are reported in Table 2, with full 95% CIs and p-values reported in the supplement (Table S3).

Within the *same informant, same measure,* correlations between proactive and reactive aggression scales varied from 0.36 to 0.79, all $p < 0.001$. In other words, scales measuring reactive aggression shared about 13–62% of their variance with scales measuring proactive aggression—at least according to the same informant and same measure. Across informants, this pattern was such that proactive and reactive aggression were most highly correlated when rated by teachers, followed by parents, and moderately correlated when rated by youth; based on 95% CIs: T ≥ P > Y > 0 (specifically, D&C: T > P > Y > 0; Raine T = P > Y > 0; where '>' and '=' are used to denote significant and nonsignificant differences, respectively).

Within the *same informant, different measure, and corresponding scales* (e.g., D&C parent reactive aggression and Raine parent reactive aggression) correlations were uniformly high, rs = 0.59 to 0.92, ps < 0.01. This suggests that the Raine and D&C measures overlap with approximately 35% to 85% shared variance, assuming same informant and corresponding scale. Here too, correlations followed the same pattern of relative magnitudes across informants: T > P > Y > 0 (same for both D&C and for Raine).

Finally, to better understand patterns of interrater agreement, we looked at correlations for the *same measure, same scale, and different informants*. Results showed modest to medium agreement for all informant pairs (parent, youth, teacher): $r_{P,Y} = 0.08$ to 0.49, $r_{P,T} = 0.15$ to 0.42, and $r_{Y,T} = 0.20$ to 0.31, which suggests roughly < 1–24% shared variance between any given informant pair. There was a tendency for higher interrater agreement on reactive than proactive, but this only reached significance for P–Y agreement on the Raine measure and for P–T agreement on D&C measures; the informant pairs on the other 4 of 6 subscales showed relatively comparable interrater agreement based on 95% CIs.

CFA Models

Results of these models are summarized here. A full reporting of the parameter estimates (model fit, model comparisons, loadings, covariances, r-squares, standard errors) can be found in Tables S4-S7 of the supplement.

D&C Models

Parent- and teacher-report models converged successfully on the first attempt. The parent-report D&C model showed adequate toto good fit (χ^2 (8) = 10.76, $p = 0.216$, CFI = 0.990, TLI = 0.981, RMSEA = 0.062 [90% CI: 0.000, 0.148], SRMR = 0.038). The teacher-report D&C model showed fit that was marginal to adequate (χ^2 (8) = 21.65, $p = 0.006$,

CFI = 0.941, TLI = 0.890, RMSEA = 0.157 [0.079, 0.239], SRMR = 0.031). For the youth-report D&C models, the initial model returned a non-positive definite solution with error warnings indicating unreliable results, which were not resolved by troubleshooting (e.g., increasing starts, re-specifications). As an alternative, we dichotomized the item-level data ("never" = 0; "very rarely" or higher = 1) and re-estimated it using WLSMV (similar to the Raine models below). This binary youth D&C CFA model converged with no issues, with results being within marginal to adequate (χ^2 (8) = 16.48, p = 0.036, CFI = 0.936, TLI = 0.880, RMSEA = 0.122 [0.030, 0.206], SRMR = 0.108). Across all three final D&C informant models (see Table S5), standardized loadings were consistently high (0.61-0.99), latent proactive and reactive aggression factors were highly correlated (rs = 0.62-0.85), and there were no modification indices flagged as being greater than 10.

Raine Models

Given this measure's length, limited item-level variance, and the small samples, some modifications were necessary for estimation. Thus, the Raine model was specified in two ways. In the first approach, we attempted to maintain fidelity to the original measure by using as many items as possible, allowing informant models to differ and dichotomizing items to support estimation. This led to estimating Raine models for parent, teacher, and youth data with 22, 20, and 23 items, respectively. As shown in Table S4, the binary Raine models showed poor fit for both parent-report data ($\chi^2(208) = 300.88$, $p < 0.001$, CFI = 0.745, TLI = 0.716, RMSEA = 0.071 [0.052, 0.088], SRMR = 0.192) and youth-report data ($\chi^2(229) = 325.77$, $p < 0.001$, CFI = 0.794, TLI = 0.773, RMSEA = 0.069 [0.051, 0.085], SRMR = 0.194). In contrast, the teacher-report Raine model showed good fit to the data from the outset $\chi^2(169) = 198.79$, $p = 0.058$, CFI = 0.983, TLI = 0.981, RMSEA = 0.051 [0.000, 0.077], SRMR = 0.135). These first models showed wide variability in standardized loadings (0.20-0.99), and the proactive–reactive correlation was medium for teacher-report ($r = 0.45$) and higher for parent- ($r = 0.67$) and youth- ($r = 0.86$) reports (see Table S6). Modification indices on these models suggested that fit could be improved by allowing cross-loadings for specific items specific to each informant model: parent-report (items 1 and 8), teacher-report (item 18), and youth-report (items 16 and 21). Most of these items are the same ones noted previously as having little or no variance (Table 3). We elected not to re-specify the models with these cross-loadings as that would deviate from the established measure and from the goal of consistency across informants. Rather, we dropped the first approach here and instead pursued the second approach.

In the second approach, we attempted to maintain fidelity to the Raine's original 3-point ordinal response scale and promote parallel items across all three informants. To accomplish this, we dropped items that had at least one informant with *zero variance* (i.e., items 9 and 21, where all respondents selected "never") or *limited variance* (i.e., items 4, 9, 10, 12, 15, 18, and 20, where no respondents selected "often") as shown in Table 3 (note that these were also the same items that were flagged by software as causing estimation problems). This process left the Raine models with 14 items, 10 for reactive and 4 for proactive. As shown in Table S4, this Raine-14 model fit the data well for parent-report ($\chi^2(76) = 87.60$, $p = 0.171$, CFI = 0.991, TLI = 0.989, RMSEA = 0.041 [0.000, 0.076], SRMR = 0.083) as well as for teacher-report ($\chi^2(76) = 118.45$, $p = 0.001$, CFI = 0.989, TLI = 0.987, RMSEA = 0.090 [0.057, 0.120], SRMR = 0.090). The youth Raine-14 model fit marginally well ($\chi^2(76) = 114.91$, p = 0.003, CFI = 0.898, TLI = 0.877, RMSEA = 0.076 [0.045, 0.103], SRMR = 0.128). None of these Raine-14 models produced any modification

indices greater than 10. And unlike the binary models, these models were consistent in showing high proactive–reactive factor correlations (0.89-0.94) and standardized loadings (0.46-0.99) across all informants (Table S6).

One Versus Two Factors

Having arrived at the best-fitting models for all three informants' data on both scales, we next considered whether these models fit better with the two proactive and reactive aggression factors as compared to a single-factor aggression model. As reported in Table S7, on D&C, the two-factor model showed improved fit relative to the one-factor model: for all informants $\Delta\chi^2(1) = 4.99–35.67$, $ps = 0.025$ to < 0.001. In contrast, the Raine-14 measure showed only marginal improvement for a two-factor model (relative to a single factor) for parents and teachers ($ps = 0.078$—0.087). There was no difference for youth-report ($p = 0.631$). These results were corroborated by the model fit indices for the one-factor models (Table S4). For D&C, the one-factor model showed poor fit across all informants (CFIs = 0.721-0.890, TLIs = 0.535-0.817, RMSEAs = 0.151-0.323, SRMRs = 0.055-0.149), while the two-factor results were better as summarized above. For Raine-14, however, a single-factor model showed mostly acceptable to good fit to the data across all informants (CFIs = 0.902–0.989, TLIs = 0.885–0.987, RMSEAs = 0.045–0.090, SRMR = 0.088–0.129), comparable to the results for the two-factor model. These results suggest that the Raine-14 approach captured a single aggression dimension whereas the D&C measure captured two correlated proactive and reactive aggression dimensions. However, it is important to reiterate that this was only a supplemental analysis of a highly modified 14-item version of the measure within this specific sample, not a true test of the Raine measure.

Relations to Depression and Effortful Control

All six aggression scales were examined for their associations with depression symptoms (parent, youth) and effortful control (parent, teacher). Due to the small sample and wide confidence intervals (averaging around r [95% CI] = estimate $\pm$ 0.20), we focus on descriptive comparisons of correlations rather than tests comparing their relative magnitude.

As shown in Table 4, reactive aggression was associated with depression symptoms, within-informant for both the D&C and Raine measures. Proactive aggression showed similar associations but with slightly lower coefficients. Teacher reports of reactive aggression were associated with youth-reported but not parent-reported depression symptoms, with reactive aggression scales more strongly linked than proactive aggression scales across measures. Effortful control, rated by parents, was highly negatively associated with parent reports of proactive and reactive aggression on both the Raine and the D&C measures. Further, teacher reports of reactive aggression on both measures were negatively associated with parent reported effortful control. For teacher-rated effortful control, significant or near-significant small correlations ($rs = -0.16$ to -0.27) with proactive and reactive aggression as rated by teachers on both measures were evident. There was only one association evident when examining youth reports of aggression, with youth reports of reactive aggression on D&C scale negatively associated with teacher reports of effortful control ($r = -0.24$).

Table 4 Correlations of measures of aggression with measures of depression and effortful control

	Pearson's *r* Correlations				Spearman's ρ Correlations			
	1	2	3	4	1	2	3	4
1. p_dep	–				–			
2. y_dep	.23*	–			.24*	–		
3. p_effcon	−.29**	-.23*	–		−.18	−.07	–	
4. t_effcon	.08	.04	.00	–	.15	−.01	.11	–
5. pd_pro	.39**	.16	−.56**	.13	.36**	.24*	−.36**	.02
6. pd_rea	**.46****	.22*	**−.49****	−.08	**.41****	.29**	**−.34****	−.11
7. yd_pro	.01	.23*	−.07	.03	.10	.20	−.06	−.11
8. yd_rea	.19	**.27***	−.09	−.24*	.17	**.35****	.05	−.23
9. td_pro	.06	.24*	−.19	−.27*	−.11	.30*	-.14	−.24*
10. td_rea	.06	.35**	−.36**	**−.16**	-.05	.33**	−.27*	**−.05**
11. pr_pro	.39**	.09	−.51**	.00	.29**	.18	−.26*	−.08
12. pr_rea	**.44****	.14	**−.44****	−.04	**.37****	.23*	**−.28****	−.04
13. yr_pro	.03	.34**	−.07	−.08	−.02	.38**	−.04	−.12
14. yr_rea	.29**	**.37****	−.16	−.12	.20	**.46****	−.11	−.08
15. tr_pro	.05	.17	−.19	−.22	−.10	.29*	−.21	−.24*
16. tr_rea	.05	.25*	−.30*	**−.19**	−.08	.19	−.20	**−.13**

Boldface denotes the hypothesized within-informant associations of interest. Prefixes: p = parent, y = youth, t = teacher, d = Dodge and Coie's (1987) measure, r = Raine et al.'s (2006) measure. Suffixes: dep = depressive symptoms, effcon = effortful control, pro = proactive aggression, rea = reactive aggression. See supplement for all coefficients with 95% confidence intervals and p-values. *$p < .05$, **$p < .01$

Discussion

The current study examined two measures of reactive and proactive aggression across three informants (i.e., parent, teacher, and youth) in order to better understand the assessment of aggression in late childhood. The overall pattern of results is consistent with the view that both measures—Dodge and Coie (1987) and Raine et al. (2006)—are psychometrically appropriate to use with parents, teachers, and youth. Findings support internal consistency, reliability, and validity, and suggest that there is knowledge gained by assessing both functions of aggression across multiple informants. However, findings also highlight potential limitations of both measures and point to important topics for further research.

More specifically, these results suggest that both the D&C and Raine measures show adequate to good internal consistency by parent and teacher report, and borderline to adequate internal consistency by youth-report. This is somewhat consistent with prior research but also in contrast to prior research indicating higher internal consistencies on the Raine measure relative to the D&C measure, which has been attributed to the inclusion of more items (Abel et al., 2020; Baker et al., 2008; Fite et al., 2009, 2012; McAuliffe et al., 2006; Rathert et al., 2011). Findings suggest that informants are reliable reporters on both measures, but that youth reports are not as consistent across items relative to parents and teachers.

Across measures and informants, proactive and reactive aggression are moderately to highly correlated with one another, which is consistent with our understanding that that many youth exhibit both functions of aggression (Fite et al., 2016b; Fite et al., 2023). These high correlations are usually not considered problematic, as other analyses demonstrate the

differential correlates and validity of each function of aggression. Further, proactive aggression demonstrated lower average levels and greater departures from normality (kurtosis and right skew) than reactive aggression across both measures and all informants. These findings suggest that reactive aggression is the more common function of aggression, which is consistent with extant literature and findings indicated that proactive aggression in the absence of reactive aggression is relatively uncommon (~ 10%; Fite et al., 2016b; Fite et al., 2023).

Ratings collected from the same informant (i.e., P, T, or Y, rating different types of aggression, or on corresponding types of aggression via different measures) tended to be highly correlated with one another (roughly 0.4–0.9 within informant type), which is consistent with prior meta-analytic estimates (Card & Little, 2006; Polmon et al., 2007). In contrast, ratings collected from different informants on corresponding scales measures consistently showed minimal to medium associations (roughly 0.1–0.4 between informants). This pattern of results indicates that individuals consistently reported levels of aggression across both measures and support the research indicating that reactive and proactive aggression commonly co-occur and share a large proportion of their variance (Fite et al., 2016b). Further, findings are consistent with the OTM viewpoint that a multi-informant approach is valuable *because* informants have unique and valid perceptions of children (De Los Reyes et al., 2013) and they differ in ratings for meaningful reasons (De Los Reyes et al., 2015). For example, we found that the correlates of proactive and reactive aggression with different reports of depression and effortful control were neither entirely consistent across all informants, nor were they entirely absent per any one informant. Thus, it is empirically *not* the case that multiple informants were contributing nothing more than measurement error, or that any one informant was simply not useful.

Moreover, there was a general pattern for higher interrater agreement on reactive rather than proactive aggression, but this was not uniformly found. Perhaps given that reactive aggression is more impulsive in nature it may be viewed and identified more readily across informants rather than proactive aggression that is more planful in nature and may be more covert in nature (Barnes et al., 2012; Cross et al., 2009; De Los Reyes et al., 2015; Rieffe et al., 2016). Additionally, findings may suggest that youth who are proactively aggressive only engage in aggression in contexts where it is conducive with their goals (e.g., at school or at home), whereas youth who are reactively aggressive engage in aggression across contexts because of universal difficulties with self-regulation.

Despite the challenges that small samples pose for factor analysis, our CFAs yielded at least one proactive–reactive aggression model showed roughly adequate or better fit for all 6 measure x informant pairings. These correlated two-factor models fit the data significantly better than a single-factor aggression model for all informants on D&C and marginally so for parent and teacher on Raine-14. TThese results support the two distinct but related functions of aggression across informants and instruments. However, due to sample characteristics, the Raine measure required significant modifications, making our CFA conclusions more specifically tied to our modified Raine-14 version and hard to draw with respect to the full established scale. Fit was better after excluding items with little or no variance, particularly, specifically those that pull for proactively aggressive behaviors that are less common in general and in younger children (e.g., Had a gang fight to be cool, Used force to obtain money or things from others, Carried a weapon to use in a fight). This suggests that these items are not as relevant for late childhood samples as they were for adolescents, the age group for which was the measure was originally intended (Raine et al., 2006). Relatedly, model fit was poorest for the youth-reported Raine-14 model, which is also where the data showed better fit to a single-factor aggression model. Factor dimensions can be less robust and more diffuse when estimated from youth-report data at ages where overall levels of problem behaviors may be more apparent than nuanced distinctions

underlying those behaviors. Thus, as children get younger, greater emphasis (especially on the two dimensions) might be placed on parent and teacher reports. When considering the small sample, age range, and data peculiarities requiring model adjustments, it appears that the D&C measure can be used to assess proactive and reactive aggression according to parent, teacher, and youth report, and the Raine for at least parent and teacher.

Overall, both the D&C and Raine measures demonstrated the expected correlations within-informant with multi-informant measures of depression symptoms and effortful control. Regarding depression symptoms, reactive aggression was more strongly linked to depression symptoms than proactive aggression across informants and measures, but this was particularly true for the D& C measure across informants and youth reports of depression symptoms. Reactive aggression has been robustly linked to depression symptoms across studies (Fite et al., 2016b). Note, however, that across measures and informants, there were several instances of a link between proactive aggression and depression symptoms, which has been found with youth reports of aggression (e.g., Abel, 2020). There may be something about aggression in general that links both proactive and reactive aggression to depression symptoms (Bilgiç et al., 2017; Rieffe et al., 2016). Alternatively, this may be reflective of the strong overlap and shared variance in proactive and reactive aggression (Fite et al., 2016b) and that correlation analyses did not control for this statistical overlap. Thus, it appears that both measures across all three informants can be used to better understand associations with depression symptoms, particularly for reactive aggression, with youth reports of depression symptoms producing the most consistent results.

With regard to effortful control, minimal associations were found with teacher reports of effortful control. In contrast, both parent and teacher reports of reactive aggression on both measures were negatively associated with effortful control, which is consistent with prior research (Rathert et al., 2011) and the field's conceptualization of reactive aggression (Frick & Morris, 2004; Rathert et al., 2011). However, youth reports of reactive aggression were not as strongly linked to effortful control, with this association only evident in one of four analyses. Thus, youth reports may not be the best to utilize when wanting to understand associations between aggression and effortful control. There was also some evidence of proactive aggression being negatively linked with effortful control in same informant analyses, which is consistent with prior research (González-Peña et al., 2013; Sontag et al., 2011; Xu et al., 2009). Findings may indicate that both functions of aggression are characterized by difficulties inhibiting aggressive behavior. Again, however, this may be a reflection of the overlap in proactive and reactive aggression, as it is rare for an individual to demonstrate only proactive aggression (Fite et al., 2016b).

The study's findings should be considered in light of its limitations. First, the sample size was relatively small and only included 9 to 12-year-old youth. The smaller sample size and younger sample likely contributed to item variance characteristics for a few items on the Raine proactive aggression scales demonstrating floor effects, which necessitated adjustments in model specification. These aspects of the data limit generalizability and precluded tests of invariance and tests of the "true" Raine model, involving all 23-items; thus, we advise caution not to draw strong conclusions concerning the full Raine measure or with regard to comparisons across informants on either measure. Robust tests of invariance across informants and other groups (e.g., by gender and age) remain an important direction for future research. Further, while filling a necessary gap in the literature with this age range, future research on multi-informant measure comparisons would do well to include larger sample sizes and broader age ranges. A larger sample size would also allow for the examination of potential demographic differences (e.g., gender, race, and ethnicity), as demographic differences in rates of aggression have been found (e.g., Fite ey al., 2023).

In addition, the current sample was community recruited, which resulted in limited levels of aggression, depression, and effortful control. The current findings may be more pronounced in clinical or aggressive samples. Another potential methodological limitation of this study is the potential for social desirability bias. Children and parents were required to respond verbally to items about behaviors they may wish to avoid disclosing (e.g., themselves or their child being aggressive). Although this approach is common in various sample types, future research should consider using computer-assisted reading of measures (e.g., ACASI) as well as other types of measures (observation and sociometric ratings). Moreover, the current measures do not readily differentiate the forms (i.e., physical, relational, cyber) of aggression, and only two correlates (depression and effortful control) of aggression were examined in the current study. Additional work examining informant differences in both forms and functions of aggression and their associations with additional adjustment correlates will be an important next step in this line of research.

Despite these limitations, current findings have direct implications for how to assess aggression in late childhood. We emphasize that these findings do not support making modifications to either measure, but instead provide support for both measures and point to settings and samples in which one may be more appropriate than the other. Although the Raine measure includes some items that may not be as relevant for late childhood as they are for adolescence, the measure is psychometrically sound and associated with the D&C measure within the current sample. As such, both measures appear to be suitable for assessing reactive and proactive aggression within this age range, allowing for some choice based on the characteristics of each measure. The D&C's unique strengths including its brevity, and the 5-point variability across response options, and useful with younger children in different contexts. The Raine measure is longer but with the benefit of capturing more behaviors with greater severity and heterogeneity that may be especially relevant to work with adolescents. Findings suggest that youth reports of aggression are adequate, but parent and teacher reports on both measures were more reliable and are more consistently associated with effortful control. Thus, while all three informants appear to provide valuable information regarding aggression, it may be beneficial to not rely solely on youth reports of aggression within this age group.

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Data availability Data are available upon request; the first and second authors take responsibility for the integrity of the data and accuracy of data analyses.

Declarations

Conflicts of interest The authors have no relevant financial or non-financial interests to disclose.

Consent to Participate Consent was obtained for all participants.

Consent for Publication The authors provide consent for publication.

Ethics Approval All procedures were approved by the Institutional Review Board and follow APA ethical guidelines.

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