Callous-Unemotional Traits, Behavior Disorders, and the Student–Teacher Relationship in Elementary School Students

Kathleen I. Crum, MS1, Daniel A. Waschbusch, PhD1,2, and Michael T. Willoughby, PhD3

Abstract
Mental health research demonstrates that children with conduct problems (CP) and callous-unemotional (CU) traits differ in important ways from children with CP alone, including differences in primary caregiver attachment quality. This research suggests CU may also influence the quality of attachment between children with CP and their teachers. This study compared children with CP alone (CP), CU alone (CU), both CP and CU (CPCU), and neither CP nor CU (comparison) on measures of the student–teacher relationship (STR). Participants were 1,554 students from seven elementary schools. Teachers completed ratings of STR, behavior (CP, CU, attention-deficit/hyperactivity disorder [ADHD]), and impairment approximately 4 to 6 weeks after the start of the school year, and again 4 to 6 weeks before the school year’s end. Random intercept hierarchical linear models (HLMs) showed that (a) children with CPCU had the highest conflict and lowest closeness with teachers at the start of the school year and the greatest end-of-year impairment, (b) higher conflict and lower closeness with teachers at the school year’s start were associated with greater end-of-the-year impairment, (c) there was no interaction between group (CP, CU, CPCU, or comparison) and STR in predicting end-of-the-year outcomes, and (d) ADHD was robustly associated with end-of-the-year impairment.

Keywords
student–teacher relationship, callous-unemotional traits, conduct problems

A pattern of hostile, negativistic, rule-breaking behavior known as conduct problems (CP) comprises one of the most commonly observed difficulties among elementary school students (e.g., August, Realmuto, MacDonald, Nugent, & Crosby, 1996). These behavior problems are associated with significant teacher stress and classroom disturbance (e.g., Boyle, Borg, Falzon, & Baglioni, 1995; Friedman-Krauss, Raver, Morris, & Jones, 2014; Spilt, Koomen, & Thijs, 2011), as well as negative short- and long-term outcomes for children struggling with CP. For example, children with CP are involved in frequent disciplinary encounters with school staff and administration, and are often the target of intervention services (Wilson, Gottfredson, & Najaka, 2001). Over the course of their lives and educational careers, these children are at risk of unfavorable life events and outcomes (Moffitt, Caspi, Dickson, Silva, & Stanton, 1996), including low academic achievement (Mattison, Spitznagel, & Felix, 1998; Nelson, Benner, Lane, & Smith, 2004), difficulty finishing school (Sutherland & Wehby, 2001), and employment and relationship instability (Loebel, Burke, Lahey, Winters, & Zera, 2000). Children with CP are also at risk of involvement with the criminal justice system, as shown in a nationally representative longitudinal study that found emotionally disturbed children with serious behavior problems had higher rates of arrests, police contacts, jail time, and probation or parole later in development (Newman et al., 2011). Given the significant burden placed on students with CP and their educators, understanding these problems in the school context is critically important.

Although the relationship between student CP and negative long-term outcomes is well-established, extensive research documents the existence of significant heterogeneity among children with CP. CP takes on several forms, not all of which are recognized by the current educational services system. Distinguishing different forms of CP by etiology and presentation may be important in understanding

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and providing services for these students. One factor that has proven useful in this regard is callous-unemotional (CU) traits (Frick, Ray, Thornton, & Kahn, 2014).

Prototypically, children with CU show a lack of remorse or guilt after misbehavior, a lack of empathy or concern for others, indifference about performance in developmentally important areas, and a shallow or deficient affective style (Frick & Ellis, 1999). Affecting roughly one third of youth with behavior problems (Christian, Frick, Hill, Tyler, & Frazer, 1997), CU traits are associated with significant social and behavioral impairment (Fontaine, McCrory, Boivin, Moffitt, & Viding, 2011; Waschbusch, Carrey, Willoughby, King, & Andrade, 2007). Notably, CU traits remain stable throughout childhood and adolescence (Frick, Kimonis, Dandreaux, & Farell, 2003; Obradovic, Pardini, Long, & Loebner, 2007), with a subset of adolescents continuing to exhibit these traits in adulthood (Lynam, Caspi, Moffitt, Loebner, & Stouthamer-Loebner, 2007). This stability appears to be largely due to genetic effects, and although CP and CU are moderately to highly associated, there are unique genetic contributions to each of these constructs, suggesting distinguishable developmental pathways (Frick et al., 2014). Importantly, there is now consistent, replicated evidence from mental health studies that CP children with CU traits (CPCU) differ in key ways from CP children without CU traits (CP-only). For example, as compared with children with CP-only, children with CPCU exhibit antisocial behavior that is more severe, stable, and varied in nature (Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick & Dantagnan, 2005; Frick & Ellis, 1999); show dampened sensitivity to punishment and heightened sensitivity to reward cues (O’Brien & Frick, 1996); and may be less amenable to behavioral treatment (Hawes & Dadds, 2005; Waschbusch et al., 2007). Children with CPCU are also deficient in cognitive and affective empathy (Anastassiou-Hadjicharalambous & Warden, 2008; Dadds et al., 2009) in comparison with CP-only counterparts, including on brain imaging studies completed during affective and empathy-related tasks (e.g., Sebastian et al., 2012), and display higher levels of both reactive (lashing out in response to perceived provocation) and proactive (calculated, goal-directed aggression in the absence of anger; Dodge & Coie, 1987) aggression than children with CP-only (Frick, Cornell, et al., 2003; Frick & Ellis, 1999; Waschbusch et al., 2004).

Based on these and many other studies (see Frick et al., 2014, for a review), CU traits have recently gained formal acceptance into current psychiatric taxonomies of CP in children, as evidenced by the introduction of the “limited prosocial emotions” specifier into the recently released fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013). In contrast, educational service classification systems have yet to acknowledge distinctions between children with CPCU and CP-only. This is likely due, in part, to the fact that almost no research has examined whether the differences between CPCU and CP-only children extend into the educational domain, or whether taking CU into account when considering CP in youth offers incremental benefit to educational professionals who are responsible for service assessment and implementation.

The student–teacher relationship (STR) is one educationally relevant domain where it may be important to examine the role of CU traits. Numerous studies over the past few decades have demonstrated the importance of the STR on child development. Above and beyond the influence of concurrent behavioral difficulties, relationship quality between teachers and students predicts long-term outcomes, including subsequent aggression (Hughes, Cavell, & Jackson, 1999), academic success and work habits (Hamre & Pianta, 2001; Howes et al., 2008), and conduct infractions (Hamre & Pianta, 2001). STRs characterized by high levels of closeness and low levels of conflict are associated with successful school adjustment (Baker, Grant, & Morlock, 2008; Pianta, Steinberg, & Rollins, 1995) and higher levels of academic achievement (Howes et al., 2008). Furthermore, high-quality STRs appear most predictive and beneficial for children at high risk of poor long-term outcomes due to existing behavior problems (Hamre & Pianta, 2001), developmental vulnerabilities (Baker, 2006), and parent–child attachment difficulties (Hughes et al., 1999). That is, among children with behavior problems, conflicted STRs and the negative interaction patterns that perpetuate them (Ladd & Burgess, 1999; Sutherland & Oswald, 2005) are associated with reduced classroom engagement and academic achievement (Hamre & Pianta, 2001; Stipek & Miles, 2008), decreased prosocial behavior (Birch & Ladd, 1998), and other negative behavioral outcomes (Hamre & Pianta, 2001).

Despite the potential for unique benefits of a positive STR in this population, children with behavior problems are likely to experience frequent negative interactions with teachers by virtue of their antisocial behavior (e.g., Gunter & Coutinho, 1997), and thus are at risk of a strained STR. Children with behavior problems receive little positive attention for appropriate behavior (e.g., Shores et al., 1993; Wehby, Lane, & Falk, 2003)—in fact, research suggests that in contrast to children at mid-risk of aggression, children at high-risk of aggression may not receive consistent praise for correct academic responding (Van Acker, Grant, & Henry, 1996). Children displaying behavior problems and who are at risk of aggression are also given fewer opportunities to respond to academic requests (e.g., Van Acker et al., 1996; Wehby, Symons, & Shores, 1995), and are more likely than non-disruptive classmates to receive reprimands rather than redirection following inappropriate behavior (Nelson & Roberts, 2000). These negative interaction patterns both contribute to and are influenced by the quality of student–teacher interactions and relationships (Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008;
Sutherland & Oswald, 2005). STRs remain moderately stable across the school year, as well as multiple years of schooling (e.g., Ladd & Burgess, 1999). However, without intervention, children with externalizing behavior problems experience gradual increases in STR conflict (Split, Hughes, Wu, & Kwok, 2012), signaling the importance of examining factors that affect these relationships and their association with student outcomes. Given the influential role played by the STR in understanding CP in school settings, combined with the fact that CU traits have proven valuable to understanding CP in the mental health field, it seems logical to examine the role of CU traits in STRs. However, no research (that we are aware of) has yet done so.

More specifically, there are several reasons why children with CP and CU traits may have especially impaired relationships with their teachers. First, there is consistent and replicated evidence that children with CPCU are prone to exhibiting antisocial behavior that is particularly frequent and severe (e.g., Frick, Cornell, et al., 2003; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005). As such, children with CPCU are likely to have more frequent conflicts and require more frequent disciplining—as well as receive less frequent praise—from teachers, which in turn is associated with lower quality STRs (Henricsson & Rydell, 2004).

Second, children with CPCU may be less likely to develop positive relationships by virtue of their temperamental characteristics. That is, interpersonal callousness is a defining feature of CU traits and has been shown to interfere with positive relationship development (Frick, 2004). Indeed, children with CPCU are less likely to form positive, secure attachments with their primary caregivers (Pasalich, Dadds, Hawes, & Brennan, 2012), and their caregivers often withdraw in response to what they perceive as a lack of affection (Kimonis, Cross, Howard, & Donoghue, 2013) and remorse (Muñoz, Pakalniskiene, & Frick, 2011) exhibited by their children. To the extent that these results generalize from parent–child relationships to STRs, they suggest that children with CPCU lack close, positive relationships with their teachers—but this hypothesis has not been tested empirically.

Third, there is evidence that, despite potential difficulties in establishing meaningful social relationships, high-quality interactions with an adult authority figure appear highly beneficial to children with CPCU when they do develop (Pardini, Lochman, & Powell, 2007; Pasalich, Dadds, Hawes, & Brennan, 2011). A body of research suggests that children with CPCU have varying susceptibility to socialization efforts, and that children with CPCU who share the most warm and caring relationships with their parents have the lowest rates of antisocial behavior (see Waller, Gardner, & Hyde, 2013, for a review).

In summary, existing research suggests that the STR may be especially impaired among children with CPCU, though the presence of CU traits along with behavior problems typical of CP is not yet recognized in the educational setting. At the same time, the STR may be especially influential in determining their behavioral and other educational outcomes, suggesting it holds high promise as a target for school-based interventions for children with CPCU. Importantly, these conclusions are inferred from studies that examined parent–child relationships; no research that we are aware of has examined the quality of the STR in children with and without CU traits.

As in any research, it is important to consider and account for possible confounding factors. In the present study, one such factor is attention-deficit/hyperactivity disorder (ADHD). There are several reasons why ADHD may play a critical role in understanding CP, CU, and STRs. First, ADHD and CP commonly co-occur and do so asymmetrically. That is, about one half of children with ADHD have CP, whereas the vast majority—up to 90% in some studies—of children with CP have ADHD (Hinshaw, 1987; Loeb & Keenan, 1994). Second, there is strong evidence that the co-occurrence of ADHD and CP results in more severely impaired cognitive and social functioning compared with either condition alone (Waschbusch, 2002). Importantly, this extends to the quality of relationships with adult caregivers (e.g., Podolski & Nigg, 2001). Of note, teachers report that children with ADHD are generally more stressful to teach than classmates without ADHD, but this is especially true for those with ADHD and CP (Greene, Besztercsey, Katzenstein, Park, & Goring, 2002). Third, research shows that ADHD is important to consider when examining CU traits in children with CP. For example, Waschbusch and Willoughby (2008a) found that both ADHD and CU moderated the association between CP and school outcomes (e.g., academics, classroom behavior) such that higher CP was associated with worse outcomes on these measures, but this was especially true when CP co-occurred with ADHD, CU, or both. In summary, research clearly shows that ADHD has significant associations with STRs, CP, and CU, and it is therefore important to take ADHD into account when examining these constructs.

The purpose of this study was to examine the role of CU traits in understanding the quality of STRs in elementary school-age children with and without CP. To do so, we first compared STRs measured near the start of the school year in children with CP alone (CP-only), CU traits alone (CU-only), both conditions (CPCU), and neither condition (comparison). We hypothesized that students with CPCU, CP-only, and CU-only would each have greater conflict and less closeness with their teachers as compared with comparison students, with the lowest quality STRs for children with CPCU. We then examined whether STR quality or group status (comparison, CP-only, CU-only, CPCU) at the start of the school year was associated with functional impairment at the end of the school year, and whether group status and STR quality interacted to predict end-of-the-
impairment. We hypothesized that STR quality and group status would interact such that each would predict end-of-the-year impairment—that is, students with CPCU and students with low-quality STRs at the start of the year would be more impaired at the end of the year—but impairment would be especially high for CPCU children with poor STRs.

Method

Participants

Participants were 1,554 children who were students in one of seven elementary schools, representing 66 classes/teachers in a single school district of eastern Canada. The participating school district included 58 elementary schools that served approximately 13,000 elementary school students (Nova Scotia Department of Education, 2003). The participants ranged in age from 5 to 12 years (M = 8.13, SD = 1.93) and included 809 boys (52%) and 745 girls (48%). Estimated Hollingshead (1975) four-factor socioeconomic status (SES) scores ranged from 14 to 66 (M = 36, SD = 13), which indicates the sample was mostly in the middle class (e.g., clerical, sales, skilled employees). Ethnic and racial information of the participants was not collected (at the request of the participating school district) but the schools served communities that were over 95% Caucasian (Nova Scotia Department of Finance, 2003). For purposes of this study, children were grouped into one of four mutually exclusive groups: comparison (n = 1,536), CU-only (n = 56), CP-only (n = 58), or CPCU (n = 95) based on teacher ratings of CP and CU using procedures and measures described below. Table 1 provides descriptive statistics for all predictors and outcomes for the total sample, as well as separately by group.

Procedure

Data were collected as part of the Behavior Education Support and Treatment (BEST) school intervention program (Waschbusch, Pelham, Massetti, & Northern Partners in Action for Children and Youth, 2005). The BEST project was designed to prevent and treat disruptive behavior in elementary school settings using behavioral strategies delivered at universal, targeted, and clinical levels. All procedures and measures were approved by a university Human Ethics Review Board and by the participating schools and school district, and informed consent was obtained from parents and teachers. Schools were recruited by contacting principals and providing them information about the project through presentations and written materials. Principals then met with their staff and subsequently contacted the project coordinator if their school wished to participate. Within the school district, seven schools volunteered to participate. Three of these seven schools were randomly assigned to the intervention condition and the remaining four participated as controls.

The present study uses teacher ratings collected as part of that study. Teacher ratings were collected approximately 4 to 6 weeks after the start of the school year, but before the start of the intervention. Teachers in participating schools were asked to complete a packet of rating scales, including

<table>
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<tr>
<th>Table 1. Descriptive Statistics.</th>
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<tbody>
<tr>
<td>Variable</td>
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<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>IOWA oppositional/defiant</td>
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<tr>
<td>IOWA inattentive/overactive</td>
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<td>STRS Conflict</td>
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<td>STRS Closeness</td>
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<td>Age (years)</td>
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Percent

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<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Treatment</td>
</tr>
<tr>
<td>T2 oppositional defiant</td>
</tr>
<tr>
<td>T2 impairment (classroom)</td>
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<tr>
<td>T2 impairment (teacher)</td>
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<tr>
<td>T2 impairment (peer relations)</td>
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<td>T2 impairment (academic)</td>
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</table>

Note. All variables were measured at the start of the year unless noted as Time 2 (T2, end-of-the-year); IOWA = IOWA Connors Rating Scale (Loney & Milich, 1982); STRS = Student–Teacher Relationship Scale (Pianta, 2001); Time 1 variables Ns = 1532–1535; Time 2 variables Ns = 1418–1431. CU = callous-unemotional; CP = conduct problems; CPCU = conduct problems with callous-unemotional traits.
those used in this study. All raters were told that completing the ratings was voluntary and that their responses would be confidential. Homeroom teachers were given the option of taking an in-service day to complete ratings on students in their homeroom classrooms, and all teachers \((n = 66)\) elected to do so. Therefore, ratings by homeroom teachers were completed for nearly all students in participating schools. These procedures were repeated at the end of the school year, approximately 7 months later. As mentioned above, initial teacher ratings were conducted prior to the start of the intervention, precluding any intervention-related effects in testing our first, cross-sectional hypothesis. To avoid a potential confound, intervention status was treated as a covariate in the longitudinal analyses.

**Measures**

**Assessment of Disruptive Symptoms—DSM-IV Version (ADS-IV).** The ADS-IV is a 29-item measure of *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; APA, 1994) symptoms of ADHD and oppositional defiant disorder (ODD; Waschbusch, Sparkes, & Northern Region Partners in Action for Children and Youth, 2003). Items are rated using Likert-type scales that range from 0 to 4, where lower ratings indicate the child exhibits the symptom less than other children, and higher ratings indicate the child exhibits the symptom more than other children. This study used the ODD scale completed at the end of the school year (Cronbach’s \(\alpha = .98\)) as an outcome measure.

**Nova Scotia Modified IOWA Conners (NSIC).** The NSIC (Waschbusch et al., 2004) is a measure of disruptive behavior consisting of 25 teacher-rated items, each of which is rated using Likert-type scales that range from 0 (not at all) to 3 (very much). The ADHD, CP, and CU scales completed at the start of the school year were used in this study. The ADHD and CP scales each consist of five items that measure, respectively, inattentive-impulsive-hyperactive behavior \((\alpha = .89)\) and oppositional-defiant behavior \((\alpha = .90)\). These scales have well-established reliability and validity in previous research (e.g., Waschbusch & Willoughby, 2008b). The CU scale \((\alpha = .93)\) consists of three items: “seems to enjoy being mean,” “is cold and uncaring,” and “lacks remorse for misbehavior.” These items were averaged to compute the CU score. The CU scale was developed specifically for the larger intervention study as a CU screening tool because other measures of CU, such as the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004), were not yet published. The reliability and validity of this scale have been supported in previous research. For example, the scale is significantly associated \((r_s \geq .48)\) with the CU scale from the APSD in samples of elementary school students recruited from regular classroom settings \((n = 208;\) Waschbusch & Willoughby, 2008a) and from clinical settings \((n = 160;\) Waschbusch et al., 2007).

**Student–Teacher Relationship Scale (STRS).** The STRS (Pianta, 2001) is a measure of teacher-rated perceptions of the quality of their relationships with students. The STRS consists of 28 items rated on Likert-type scales that range from 1 (definitely does not apply) to 5 (definitely applies). Items were summed to compute three subscale scores: Conflict, Closeness, and Dependency. The Conflict \((\alpha = .88)\) and Closeness \((\alpha = .84)\) subscales measure negativity versus warmth and openness, respectively. Dependency was not included because it was not theoretically relevant to our objectives, the internal consistency was somewhat low \((.61)\), and the convergent and discriminant validity of this subscale remains unclear (Doumen et al., 2009). Previous research has demonstrated the internal consistency reliability (Pianta, 2001) and concurrent and predictive validity (Birch & Ladd, 1998; Hamre & Pianta, 2001; Pianta et al., 1995) of the Conflict and Closeness subscales.

**Impairment Rating Scale (IRS).** The IRS (Fabiano et al., 2006) is a six-item measure of children’s impairment in developmentally important areas. Four of the six teacher-rated items were used in this study: peer relationships, getting along with teachers, academic progress, and classroom behavior. An item measuring self-esteem was not used because it was not relevant to the study aims, and an item measuring overall impairment was not used because it overlaps with other items. For purposes of this study, items were rated using Likert-type scales that ranged from 0 (no need for treatment) to 4 (very severe need for treatment). Each item represents a specific domain of impairment, allowing assessment of functioning using individual items. Because each area of impairment is evaluated with a single item, it is not possible to compute internal consistency reliability. However, the test–retest reliability and convergent and discriminant validity of the individual impairment domains assessed in this measure have been supported in several samples, including the present sample (see Fabiano et al., 2006, for details).

**Participant Grouping**

Reflecting the normative nature of the sample, CP and CU scores were highly skewed. As a result, CP and CU were examined categorically by sorting children into four mutually exclusive groups (see Table 1): (a) comparison—neither high CU nor high CP, (b) CU-only—high CU but average or low CP, (c) CP-only—high CP but average or low CU, (d) CPCU—high CU and high CP. Children were identified as high CU if they had scores above zero on the CU scale of the NSIC. This grouping procedure follows earlier research and has good agreement compared with groups.
formed using the CU scale from the APSD (Waschbusch, Graziano, Willoughby, & Pelham, 2014). Children were identified as high CP if they had scores above the 90th percentile on the CP scale of the NSIC. The 90th percentile cutoff has been used in earlier research on this scale (Waschbusch & Willoughby, 2008b) and corresponds to the cutoff used in several other studies of disruptive behavior (e.g., Hack et al., 2004; Nigg, Willcutt, Doyle, & Sonuga-Barke, 2005; Shaw, Owens, Giovanelli, & Winslow, 2001).

Analytic Strategy

Group differences in initial STR quality. To accommodate the nested data structure (children nested in teachers), two random intercept hierarchical linear models (HLMs), one each for STRS Conflict and Closeness subscales, were estimated. Both models included the same set of predictors, including group membership (comparison, CU-only, CP-only, CPCU), which was of primary interest, and child gender, age, and ADHD symptomatology as covariates. ADHD symptomatology was controlled for in each model because evidence suggests ADHD affects CP, CU, and the STR, as described earlier. In addition, age and gender have been shown to affect the nature and severity of CP (e.g., Lahey, Schwab-Stone, Goodman, & Waldman, 2000; Saft & Pianta, 2001), and were entered as covariates in each statistical model. Children were nested in teachers, but teachers were not nested in schools because there were too few schools (seven) available to obtain a reliable estimate of school-level variation (Maas & Hox, 2005). The three-degree-of-freedom test for group membership provided an omnibus test of group differences; significant group effects were probed using all pairwise comparisons that included an initial model because evidence suggests ADHD affects CP, CU, and the STR, as described earlier. All pairwise comparisons were statistically significant, they were removed from the model and the model was re-estimated to include main effects.

Results

Group Differences in Initial STR Quality

Conflict. An unconditional random intercept HLM was estimated to characterize the dependence of the data. Both the random intercept (τ = .38, p < .0001) and residual variance (ε = .38, p < .0001) were significant, resulting in an intra-class correlation (ICC) of 0.17. This model was extended to include predictors. Group membership, F(1, 1461) = 302, p < .0001; gender, F(1, 1461) = 6.5, p = .01; and ADHD, F(1, 1461) = 286, p < .0001, were significant predictors, but age, F(1, 1461) = 0.4, p = .52, was not. The least-square means were −0.20, 0.64, 1.00, and 1.77 for the comparison, CU-only, CP-only, and CPCU groups, respectively (higher scores indicate greater conflict). All pairwise comparisons were statistically significant (all ps < .0001, except CU versus CP, which was p = .007). Given the standardization of outcomes, this...
Table 2. Prediction of End-of-the-Year Impairment.

<table>
<thead>
<tr>
<th>Variable</th>
<th>ODD OR (95% CI)</th>
<th>Classroom OR (95% CI)</th>
<th>Teacher OR (95% CI)</th>
<th>Peer OR (95% CI)</th>
<th>Academic OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closeness</td>
<td>1.38 [1.04, 1.82]**</td>
<td>0.87 [0.71, 1.08]</td>
<td>0.74 [0.59, 0.95]**</td>
<td>0.90 [0.68, 1.19]</td>
<td>0.72 [0.56, 0.91]**</td>
</tr>
<tr>
<td>Conflict</td>
<td>1.98 [1.22, 2.75]***</td>
<td>1.74 [1.31, 2.32]***</td>
<td>1.85 [1.45, 2.36]***</td>
<td>1.61 [1.17, 2.21]**</td>
<td>0.83 [0.59, 1.19]</td>
</tr>
<tr>
<td>CPCU</td>
<td>7.26 [3.38, 15.59]***</td>
<td>1.84 [0.86, 3.93]</td>
<td>1.63 [0.78, 3.37]</td>
<td>3.20 [1.38, 7.44]**</td>
<td>0.92 [0.37, 2.26]</td>
</tr>
<tr>
<td>CP</td>
<td>1.65 [0.69, 3.97]</td>
<td>0.74 [0.39, 1.40]</td>
<td>1.36 [0.61, 3.03]</td>
<td>0.87 [0.29, 2.62]</td>
<td>0.78 [0.27, 2.21]</td>
</tr>
<tr>
<td>CU</td>
<td>1.74 [0.56, 5.41]</td>
<td>2.11 [0.98, 4.56]</td>
<td>1.14 [0.44, 2.93]</td>
<td>1.52 [0.58, 3.99]</td>
<td>1.88 [0.84, 4.22]</td>
</tr>
<tr>
<td>Male</td>
<td>0.96 [0.66, 1.42]</td>
<td>1.07 [0.64, 1.79]</td>
<td>0.97 [0.61, 1.55]</td>
<td>1.32 [0.88, 1.97]</td>
<td>0.80 [0.52, 1.25]</td>
</tr>
<tr>
<td>Tx</td>
<td>1.41 [0.74, 2.69]</td>
<td>1.17 [0.60, 2.28]</td>
<td>1.11 [0.55, 2.27]</td>
<td>1.07 [0.54, 2.14]</td>
<td>1.04 [0.62, 1.77]</td>
</tr>
<tr>
<td>Age</td>
<td>1.30 [0.94, 1.79]</td>
<td>0.88 [0.65, 1.19]</td>
<td>1.08 [0.78, 1.50]</td>
<td>1.28 [0.96, 1.70]</td>
<td>1.09 [0.78, 1.50]</td>
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<td>ADHD</td>
<td>1.54 [1.24, 1.92]***</td>
<td>2.77 [2.22, 3.45]***</td>
<td>1.62 [1.30, 2.00]***</td>
<td>1.77 [1.39, 2.26]***</td>
<td>2.95 [2.37, 3.69]***</td>
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<tr>
<td>N</td>
<td>1.429</td>
<td>1.420</td>
<td>1.425</td>
<td>1.424</td>
<td>1.421</td>
</tr>
<tr>
<td>CPCU/CP</td>
<td>4.40 [2.12, 9.12]***</td>
<td>2.49 [1.20, 5.18]**</td>
<td>1.20 [0.60, 2.38]</td>
<td>3.70 [1.67, 8.19]**</td>
<td>1.18 [0.36, 3.91]</td>
</tr>
<tr>
<td>CPCU/CU</td>
<td>4.18 [1.52, 11.46]**</td>
<td>0.87 [0.36, 2.14]</td>
<td>1.42 [0.56, 3.67]</td>
<td>2.10 [0.81, 5.45]</td>
<td>0.49 [0.18, 1.33]</td>
</tr>
</tbody>
</table>

Note. ODD = oppositional-defiant disorder; OR = odds ratio; CI = confidence interval; CPCU = conduct problems with callous-unemotional traits; CP = conduct problems without callous-unemotional traits; CU = callous-unemotional traits without conduct problems; Tx = treatment versus control school; ADHD = attention-deficit/hyperactivity disorder.

*p < .05, **p < .01, ***p < .001.

indicated large-sized group differences for all disruptive groups relative to comparison youth (Cohen ds = 0.84–1.97), as well as large-sized group differences for CPCU youth relative to CU-only and CP-only youth (Cohen ds = 0.77–1.13).

Closeness. An unconditional random intercept HLM was estimated to characterize the variance structure of the data. Both the random intercept (τ = .16, p < .0001) and residual variance (ε = .30, p < .0001) were significant, resulting in an ICC of 0.34. This model was extended to include predictors. Group, $F_{(3, 1461)} = 27.6, p < .0001$; gender, $F_{(1, 1461)} = 24.7, p < .0001$; age, $F_{(1, 1461)} = 11.3, p = .0008$; and ADHD, $F_{(1, 1461)} = 47.2, p < .0001$, were all statistically significant. The least-square means were 0.11, −0.55, −0.23, and −0.60 for the comparison, CU-only, CP-only, and CPCU groups, respectively (lower scores indicate less closeness). Pairwise comparisons indicated that all three disruptive groups (CU-only, CP-only, CPCU) differed from comparison youth (ps < .01). However, comparisons among the disruptive groups indicated that the CU-only group did not differ from the CP-only (p = .12) or CPCU (p = .99) group, and the CPCU group differed from the CP-only group (p = .02). Given the standardization of outcomes, this indicated medium-sized group differences for all CU, CP, and CPCU groups relative to comparison youth (Cohen ds = 0.34–0.70) and small-sized group differences among disruptive groups (Cohen ds = 0.05–0.36).

Prediction of End-of-the-Year Impairment

ODD. An initial model did not provide any evidence that the magnitude of the associations between initial STR quality and later risk of ODD differed across groups, Group × Closeness, $\chi^2_{(3)} = 4.6, p = .21$; Group × Conflict, $\chi^2_{(3)} = 0.7, p = .87$. A main effects model indicated that increased levels of teacher–student closeness (odds ratio [OR] = 1.38, p = .02) and conflict (OR = 1.98, p < .0001) were both positively associated with risk of ODD, as were membership in the CPCU group (OR = 7.26, p < .0001) and ADHD behaviors (OR = 1.54, p < .0001). The effect for CPCU used children in the comparison group as a reference category. Two additional contrasts indicated that children in the CPCU group were also at markedly increased risk of ODD relative to CP-only (OR = 4.40, p < .0001) and CU-only (OR = 4.18, p = .006) youth (see Table 2 for all coefficients and 95% confidence intervals [CI]). As summarized in Table 2, none of the other predictors were statistically significant.

Classroom impairment. An initial model did not provide any evidence that the magnitude of the associations between initial STR quality and later risk of classroom impairment differed across groups, Group × Closeness, $\chi^2_{(3)} = 4.9, p = .18$; Group × Conflict, $\chi^2_{(3)} = 2.8, p = .42$. A main effects model indicated that increased levels of teacher–student conflict (OR = 1.74, p = .0001), but not closeness (OR = 1.38, p = .22), were associated with increased risk of classroom impairment. As summarized in Table 2, with the exception of ADHD behaviors (OR = 2.77, p < .0001), none of the other predictors were statistically significant.

Teacher impairment. An initial model did not provide any evidence that the magnitude of the associations between initial STR quality and later risk of teacher impairment differed across groups, Group × Closeness, $\chi^2_{(3)} = 0.5, p = .93$; Group × Conflict, $\chi^2_{(3)} = 1.8, p = .62$. A main effects model...
indicated that whereas increased levels of teacher–student conflict (OR = 1.85, \( p < .0001 \)) increased risk of later teacher impairment, increased levels of teacher–student closeness (OR = 0.74, \( p = .02 \)) decreased risk of later teacher impairment. As summarized in Table 2, with the exception of ADHD behaviors (OR = 1.62, \( p < .0001 \)), none of the other predictors were statistically significant.

**Peer impairment.** An initial model did not provide any evidence that the magnitude of the associations between initial STR quality and later risk of teacher impairment differed across groups, Group × Closeness, \( \chi^2(3) = 1.6, p = .67 \); Group × Conflict, \( \chi^2(3) = 3.7, p = .30 \). A main effects model indicated that although teacher–student closeness was not related to later risk of peer impairments (OR = 0.90, \( p = .46 \)), increased levels of teacher–student conflict (OR = 1.61, \( p = .004 \)) were associated with increased risk of peer impairment. In addition, children in the CPCU group exhibited additional increased risk (OR = 3.2, \( p = .007 \)) for peer impairment. Children in the CPCU group were also at increased risk of peer impairment relative to CP-only (OR = 3.7, \( p = .001 \)) but not CU-only (OR = 2.1, \( p = .13 \)) youth. As summarized in Table 2, with the exception of ADHD behaviors (OR = 1.77, \( p < .0001 \)), none of the other predictors were statistically significant.

**Academic impairment.** An initial model did not provide any evidence that the magnitude of the associations between initial STR quality and later risk of teacher impairment differed across groups, Group × Closeness, \( \chi^2(3) = 4.8, p = .19 \); Group × Conflict, \( \chi^2(3) = 6.6, p = .09 \). A main effects model indicated that although teacher–student conflict was not related to later risk of academic impairments (OR = 0.83, \( p = .32 \)), increased levels of teacher–student closeness (OR = 0.72, \( p = .007 \)) were associated with decreased risk of academic impairment. As summarized in Table 2, with the exception of ADHD behaviors (OR = 2.95, \( p < .0001 \)), none of the other predictors were statistically significant.

**Discussion**

This study examined the role of CU traits in understanding the quality of STRs in elementary school children with and without CP. To our knowledge, this is the first study to do so. Consistent with previous studies, children with CP had STRs that were characterized by less closeness and more conflict relative to peers. This was especially true for children characterized by high levels of both CP and CU. In addition, poor-quality STRs at the start of the school year, especially relationships with high levels of conflict, were associated with greater functional impairment and higher levels of ODD symptomatology at the end of the school year. Furthermore, children with CPCU at the start of the school year were at increased risk of classroom behavior impairment and peer impairment at the end of the year, even after controlling for several factors (age, sex, ADHD, intervention condition, and start-of-year STRs). These findings will be discussed in turn.

The first set of analyses examined whether groups with behavior problems (CP-only, CU-only, CPCU) differed from each other and from typically developing students (comparison) in the quality of the STR at the start of the school year. Children with any type of behavior problem (CP-only, CU-only, CPCU) had relationships with their teachers that were characterized by more conflict and less closeness as compared with typically developing peers, consistent with previous research demonstrating an elevated risk of negative STRs in children with classroom behavior problems (e.g., Baker et al., 2008; Birch & Ladd, 1998). Our study adds to these past findings by demonstrating that combined CP and CU appear to play an especially important role in this association. Indeed, our findings (see Table 1) showed that children with CPCU had significantly more conflicted relationships than either CP-only or CU-only children, and had less close relationships than children with CP-only. Past research has shown that children with CPCU, whose parents often withdraw in response to perceived callousness in their child (Kimonis et al., 2013; Muñoz et al., 2011), have a pre-dilection toward negative relationships with caregivers. Our results indicate similar trends may be apparent in their relationships with teachers, aligning with research that suggests the STR is susceptible to transactional forces (Sutherland & Oswald, 2005). Although the present study did not examine factors that explained this pattern, one can speculate that children with CPCU exhibit both heightened rates of antisocial behavior and a general predisposition to lack closeness with others, and this in turn confers a particularly high risk of developing poor-quality relationships with teachers. In response to chronic misbehavior, teachers may limit their interactions with these children—including academic instruction and positive attention for appropriate behavior (e.g., Nelson & Roberts, 2000; Van Acker et al., 1996). Although this explanation is speculative and in need of empirical study, our results clearly suggest that the STR is seriously impaired in children with CPCU—even more so than other children with behavior problems. Thus, it appears important to consider CU when examining the STR in children with CP, arguably including children classified as having emotional and behavioral disorders due to misbehavior.

The second set of analyses examined whether STR (conflict, closeness), group (comparison, CU-only, CP-only, CPCU), or their interaction measured at the start of the school year was associated with impairment measured at the end of the year. Several interesting findings emerged from these analyses. First, results showed that STR quality at the start of the year was significantly associated with impairment outcomes at the end of the school year in
expected directions: High closeness and low conflict at the start of the year generally served as a buffer against poor end-of-the-year outcomes, whereas low closeness and high conflict at the start of the year generally served as a risk for poor end-of-the-year outcomes. These associations emerged after controlling for several other factors, including behavior problems in the child. These results replicate other studies showing similar results (Hamre & Pianta, 2001; Howes et al., 2008; Hughes et al., 1999), but extend them to show that STRs also explain significant and unique variance in important student outcomes after controlling for CU traits.

Notably, conflict with teachers early in the year was significantly associated with peer relationships at the end of the school year (see Table 2). It has been established that teachers’ emotional support of students facilitates peer relationship development (Gest, Madill, Zadzora, Miller, & Rodkin, 2014; Gest & Rodkin, 2011; Luckner & Pianta, 2011). Conflict with teachers may hinder their ability to provide this support, thereby impairing the student’s peer relationships. Indeed, research suggests that teachers find aggressive, mean-spirited student behavior more concerning than friendship-related difficulties and are more likely to intervene with the former, perhaps at the expense of addressing the latter—potentially withholding valuable social support associated with positive academic and peer-bonding outcomes (Gest et al., 2014). Studies also show that teachers respond to high rates of negative behavior with reduced positive interaction even when the student begins to display appropriate behavior (Wehby et al., 2003). Furthermore, teachers’ interactions with specific students may establish social standards for acceptable classroom behavior, affecting peer perceptions of these students (Farmer, Mcauliffe Lines, & Hamm, 2011). Thus, early school year conflict with teachers may alter the teacher’s behavior toward the student, in turn negatively influencing how classmates view the student.

However, our results also showed—somewhat surprisingly—that increased levels of student–teacher closeness at the start of the year were significantly associated with increased ODD and more impaired relationships with teachers at the end of the year. There may be several explanations for these seemingly contradictory results. It is possible that initial closeness between students and teachers gives some students implicit confidence that challenging the teacher’s authority will not permanently harm their connection with the teacher, just as a healthy parent–child attachment early in development helps children develop independent behaviors later in development. In turn, this independence may produce defiance. If so, then students with an initially close STR may begin to assert their independence later by challenging the teacher’s authority. An alternative explanation is that initial closeness between students and teachers may translate into more frequent interaction, increasing the likelihood of eventual conflict and oppositional behavior. Whether these findings can be replicated, and if so what factors best explain the process, are interesting questions for future studies.

Second, results predicting end-of-the-year impairment also found that youth with CPCU at the start of the year exhibited greater ODD behavior, and more classroom and peer impairment, at the end of the school year relative to comparison and CP-only youth. Importantly, these differences emerged even after controlling for intervention condition and demographic and behavioral confounds, as well as STRs. Consistent with previous research showing that children with CPCU tend to exhibit elevated rates of antisocial behavior (Frick, Kimonis, et al., 2003), we found that children with CPCU had higher rates of classroom behavior impairment and ODD at the end of the year. Of particular relevance to the goals of the current study, our results show this pattern extends into educational domains. Also of interest were results showing that elevated peer problems at the start of the school year were associated specifically with CPCU. Previous studies suggest that children who struggle to form a positive STR also struggle with positive peer relationships (e.g., Hughes & Chen, 2011). The current study is consistent with this finding in that children with CPCU apparently struggled to form relationships with teachers at the start of the year (see Table 1), and with peers at the end of the year (see Table 2). More generally, our findings are consistent with studies showing that children with antisocial behavior experience a host of negative outcomes in school settings (e.g., Fergusson, Horwood, & Ridder, 2005), but our study adds to these by suggesting this may be especially or specifically true for antisocial children with CU traits (i.e., the CPCU group).

Third, results examining end-of-the-year outcomes found no evidence that STRs and group membership interacted to predict end-of-the-school-year impairment. In other words, the association between STRs at the start of the year and outcomes at the end of the year did not differ across groups, nor did group outcomes differ as a function of STRs. This suggests the importance of the STR to student functioning, regardless of group membership. It is important to emphasize, however, that results indicate that both STR quality (particularly Conflict) and CPCU at the start of the year are significant predictors of outcomes after taking each other—and other important variables—into account. Thus, our findings suggest that each construct is important to consider when evaluating student outcomes.

Overall, the results of this study stress the importance of taking CU traits into account when examining school functioning in general, especially when examining the school functioning of children with CP. As summarized in Tables 1 and 2, children with CPCU had the highest levels of conflict and among the lowest levels of closeness with teachers at the start of the year, and had the highest rates of negative
outcomes at the end of the school year on nearly every mea-
sure—rates 2 to 3 times higher than children with CP-only
and CU-only, and much higher than those of typically
developing students. Furthermore, the negative outcomes of
children with CPCU appear to be relatively specific to
behavioral and interpersonal domains, as they differed from
CP-only and CU-only in those areas (e.g., ODD, peer rela-
tionships) but not in other areas (e.g., academic functioning).
These results—that children with CPCU develop
particularly poor relationships with their teachers and peers,
and are at the greatest risk of negative outcomes at the end
of the school year—argue that early identification of, and
intervention with, this behavior problem group may be
especially valuable.

Our findings also suggest that intervening in the STR
may be important and beneficial to all students, as STR
quality—especially conflict—affects the likelihood of neg-
ative outcomes in the span of only one academic year, and
is able to make this contribution regardless of behavior
problem group status. It is clear from previous research that
the STR and accompanying child outcomes are amenable to
intervention in children at risk of CP (Driscoll & Pianta,
2010), signaling the potential of this relationship as a point
of entry for treatment of children with CP and/or CU. It is
likely, however, that children with CPCU will need addi-
tional interventions beyond those aimed at lowering their
conflict and raising their closeness with teachers, as evi-
denced by the fact that CPCU predicted negative outcomes
even after controlling for early-year STR measures.

Finally, it is worth noting the sizeable contribution of
ADHD observed in the results. ADHD at the start of the
school year was a significant predictor of every outcome
measure (see Table 2), even after controlling for all other
measures. These results are consistent with hundreds of oth-
ers in demonstrating the importance of considering ADHD
when examining children’s classroom and school function-
ing (e.g., Pelham & Waschbusch, 2004). Results also high-
light that research and intervention efforts—including
school-based efforts—for children with CP should always
take ADHD into account to avoid producing confounded,
confusing results (e.g., Waschbusch, 2002; Waschbusch &
Willoughby, 2008a).

These results are subject to several limitations that
should be addressed in future studies. First, teacher ratings
of relationships and child behavior, rather than combined
parent–teacher or child–teacher ratings, were used to assess
the variability of the STR and its association with child out-
comes. In light of this, method variance may have contrib-
uted to observed results. However, differential effects across
individual IRS items, rather than a pattern of “elevated on
everything” that might suggest informant bias, increase our
confidence in these findings. Even so, future studies should
supplement teacher rating scale measures with ratings from
multiple informants, as well as observational measures of
child outcomes. Second, this school-based data set is a nor-
mative sample, hence the infrequent nature of significant
behavior problems and end-of-the-year impairments. Replication of this study in samples enriched with disrup-
tive children would be informative. Third, although racial
and ethnic information were not collected at the request of
the participating school district, the schools involved in the
current study served a primarily Caucasian community
(Nova Scotia Department of Finance, 2003). The homoge-
nity of this sample may limit generalization of findings.
Future studies would do well to investigate the associations
between CP, CU, and the STR in a more ethnically diverse
sample, as well as collect supplemental demographic infor-
mation to provide a clearer view of sample characteristics.
Fourth, the brief measure of CU was appropriate for this
study, in which teachers were evaluating several constructs
on a large number of children, but using a more well-estab-
lished measure would be advantageous. It is impressive,
however, that meaningful and sizeable differences emerged
between CPCU children and other children, considering
that CU was measured with just three items that required
about 20 to 30 s to complete on each student. This suggests
that it is entirely feasible for researchers, school profession-
als, and others interested in disruptive child behavior to
screen for CU traits with very little time or cost. Fifth, chil-
dren were nested in teachers in our statistical models, but
teachers were not nested in schools because there were too
few schools (seven) available to obtain a reliable estimate
of school-level variation (Maas & Hox, 2005). Finally, our
observational design does not permit causal inference. We
cannot state unambiguously that it is the STR, per se, that
serves as a protective or risk factor because the STR was not
directly manipulated.

Despite these limitations, this study is one of the first to
examine the role of CU traits in an educational context and
the very first (that we are aware of) to examine the role of
CU in the STR. Current educational taxonomies do not take
CU into account when examining behavior disorders in
children, yet there is now consensus of the value of doing so
in psychiatric taxonomies, as research has clearly demon-
strated the importance of CU traits when seeking to under-
stand the etiology, behavioral presentation, and life
outcomes of children with CP (Frick et al., 2014). By apply-
ning this rationale to the school setting, the current study pro-
vides initial evidence of the value of distinguishing between
groups of students with CP based on CU features. This has
implications for educational staff, including school psy-
chologists, counselors, administrators, and teachers serving
children with behavior problems. Acknowledging the sig-
nificance of CU when identifying children in need of
school-based services—and providing these services—may
grant children with CPCU access to important resources,
and help schools select specific, individualized interventions
for students.
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