Incorporating Callous-Unemotional Behaviors into School-Based Research

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ABSTRACT

This study investigated the utility of including teacher-reported callous-unemotional (CU) behaviors in the assessment of disruptive behaviors in school-based research. Participants included 138 first- and second-grade children (68% male; 76% eligible for free or reduced-price lunch; 61% Black, 9% Latinx, 23% White, and 7% multiracial) who completed assessments during the baseline assessment of an intervention study. Results indicated that teachers could distinguish CU from traditional indicators of disruptive behavior, including attention deficit hyperactivity disorder (ADHD) behaviors and conduct problems (CP). When considered alone, there was mixed evidence for the utility of CU behaviors. Although higher levels of CU behaviors explained unique variation in teacher-reported social competence and global impairment, CU behaviors did not explain unique variation in disciplinary infractions, classroom behavior, or academic functioning after accounting for ADHD and CP behaviors. A different pattern of results was evident when CU was considered in conjunction with ADHD and CP behaviors. Latent profile analyses identified three subgroups of participants (i.e., a nondisruptive group, an ADHD group, and a comorbid group, who exhibited elevated levels of ADHD, CP, and CU). Compared to the nondisruptive group, the ADHD group exhibited higher rates of off-task classroom behavior and worse academic functioning. The comorbid group exhibited moderate to large differences from both groups on teacher-reported and objective outcomes. The implications of these results are discussed with respect to the potential value of incorporating CU behaviors, which are becoming prominent in clinical psychology and psychiatry, into school-based research and for school psychology practice.

Keywords: disruptive behaviors, conduct problems, ADHD, callous-unemotional, limited prosocial behaviors

IMPACT AND IMPLICATIONS

Callous-unemotional behaviors often co-occur with disruptive behaviors and contribute to profound impairment in interpersonal functioning. Consideration of callous-unemotional behaviors as a part of the assessment of disruptive behaviors may help to reduce heterogeneity among children who qualify for an emotional disturbance, per the Individuals with Disabilities Educational Act. Moreover, ongoing efforts among clinical scientists to develop innovative treatments and to personalize treatments for children with callous-unemotional behaviors may inform similar efforts by school psychologists.

Incorporating Callous-Unemotional Behaviors into School-Based Research

OVERVIEW

For much of the last four decades, researchers who study disruptive behaviors have focused on two broad domains, hyperactivity-impulsivity-inattention (HIA) and conduct problems (CP), which include oppositionality, noncompliance, and aggression (e.g., Campbell et al., 1986; Loeber et al., 1995; McGee et al., 1984; Patterson et al., 2000; Shaw et al., 2005). CP has long been understood to represent a heterogeneous category of behaviors. Efforts to reduce heterogeneity in CP have emphasized distinctions in the form (e.g., overt vs. covert), motivation (e.g., proactive vs. reactive), and age of onset (e.g., early vs. later starters) of CP behaviors (Card & Little, 2006; Fairchild et al., 2013; Loeber & Schmaling, 1985). The incorporation of callous-unemotional (CU) behaviors into assessments of disruptive behaviors has emerged as a useful way to reduce heterogeneity among children with elevated levels of CP (Frick et al., 2000; Frick et al., 1994). Specifically, a subset of children who exhibit high levels of CP have shallow interpersonal relationships, low fear, an insensitivity to punishment, and a lack of concern for the well-being of others. These attributes, which are collectively referred to as CU behaviors, exist along a continuum and are first identifiable in early and middle childhood. Whereas CU behaviors have received increasingly widespread attention in the clinical psychology, developmental psychopathology, and psychiatric literatures (Frick & Moffitt, 2010; Frick et al., 2014; Waller & Wagner, 2019; Waller et al., 2020), they have received surprisingly little attention in the school psychology and educational literatures. Below, we summarize current thinking about CU behaviors in children and consider their relevance for school psychologists and researchers.

Callous-Unemotional Behaviors: Development, Prevalence, Utility

Children who exhibit early-onset CP can be distinguished based on the presence or absence of CU behaviors (Frick & Morris, 2004; Frick & Viding, 2009). Frick and colleagues described two developmental pathways for children with early-onset CP. Children in the CP-only pathway primarily evidence problems with emotional regulation, which stem from a combination of temperamental styles (e.g., low frustration tolerance) and/or neurocognitive (e.g., executive function) deficits, often in combination with ineffective socialization experiences. Children in the CP+CU pathway primarily evidence affective problems (including atypical processing of emotion and punishment cues) that interfere with the development of empathy and prosocial behavior. Elevated levels of HIA behaviors are common for children in both pathways. Notably, these pathways are heuristic and are intended to stimulate basic research and intervention development.

Individual differences in CU behaviors emerge in early childhood, index developmental deviations in early-life experience, and are associated with the severity and persistence of CP in middle childhood. For example, Dadds and colleagues demonstrated that parents of young children could distinguish CU behaviors from more traditional indicators of HIA and CP and that CU behaviors uniquely predicted subsequent antisocial behavior (Dadds et al., 2005). This finding has been replicated in samples of preschool-age children with prediction of CP in elementary school (Hyde et al., 2013; Willoughby et al., 2014; Willoughby et al., 2011), and in school-age samples with prediction of criminality in adulthood (Pardini et al., 2018). Children, adolescents, and adults who exhibit elevated levels of CU behaviors are also more likely to have experienced harsh parenting, insecure and disorganized attachments, or abuse (Kimonis et al., 2013; Pasalich et al., 2012; Wagner et al., 2019; Wagner et al., 2015; Widom et al., 2020). Waller and Wagner (2019) recently proposed that the combination of "low affiliative reward"

(i.e., deficits in seeking out or deriving benefit from social bonding) and "low threat sensitivity" (i.e., diminished responsiveness to threat) in early childhood jointly increase the risk for subsequent CU behaviors. Hence, CU behaviors may index a combination of atypical early interactions with caregivers and unique temperamental or social-cognitive characteristics of children.

Because CU behaviors exist along a continuum, it is difficult to characterize the prevalence of CU. One of the most ambitious attempts involved a study of developmental changes in teacher-reported CP and CU behaviors across a large sample (> 9000) of twins 7–12 years of age in the United Kingdom (Fontaine et al., 2011). Notably, 75% of children were characterized by consistently low levels of CP and CU throughout childhood, and an additional 11% were characterized by decreasing CU and consistently low CP behaviors. The remaining 14% evidenced either consistently high CP and/or increasing CU behaviors from age 7–12 years, including 4% of children with high CP and CU. In a board survey of the literature, Frick and colleagues estimated that 20%–50% of all children with elevated CP also demonstrate elevated levels of CU behaviors (Frick et al., 2014). Hence, a substantial minority of children who exhibit elevated CP also exhibit elevated levels of CU behaviors.

Although all children with elevated CP benefit from treatment, there is mixed evidence about the responsiveness of CP+CU youth to traditional evidence-based treatments (Hawes et al., 2014; Wilkinson et al., 2016). Although CP and CU behaviors tend to improve with treatment, CP+CU youth typically begin and end treatment with more severe and diverse forms of antisocial behavior. It has been suggested that CP+CU youth may require adjunct services; however, the initial attempts to adapt or develop new interventions that are specifically tailored to neurocognitive and temperamental characteristics of CU youth have had limited to no success

(Byrd et al., 2018; Dadds et al., 2019; Waschbusch et al., 2020). More research is needed to determine how best to personalize treatments for children with elevated HIA, CP, and/or CU behaviors.

In clinical research and practice, attending to the co-occurrence of HIA, CP, and CU behaviors is becoming more routine. However, similar efforts have been slower to develop in educational research and practice. We are only aware of a few studies that have focused on CU behaviors in elementary or middle school settings. Waschbusch and Willoughby (2008) reported a complex pattern of associations between elevated levels of teacher rated HIA, CP, and CU and corresponding indicators of classroom, academic, and peer impairment in elementary grade children. Specifically, they demonstrated that HIA, CP, and CU behaviors each conveyed unique patterns of risk for school functioning and provided evidence that the effects of CP on school outcomes often depended on (were moderated by) co-occurring levels of HIA and CU behaviors. Waschbusch and colleagues have also documented that the co-occurrence of HIA, CP, and CU behaviors is uniquely and sometimes jointly associated with poorer classroom behavior and impairments in teacher–student relationship quality (Crum et al., 2016; Waschbusch et al., 2015). Allen and colleagues used qualitative methods to characterize teachers' impressions of children with elevated CU behaviors in middle school settings (Allen et al., 2018; Allen et al., 2016). Teachers perceived children with elevated CU behaviors as being less responsive to disciplinary strategies that involve punishment, less responsive to teachers' nonverbal cues of disapproved behavior, and less motivated to engage in academic work—all consistent with the defining features of CU behaviors.

Current Study

We aim to draw greater attention to CU behaviors in young, elementary school-aged children, with a focus on multiple indicators of school functioning. Initially, we tested whether teachers could reliably distinguish CU from HIA and CP behaviors in early elementary school-aged (first and second grades) children. If teachers view CU behaviors as distinct from HIA and CP behaviors, this may create opportunities to leverage insights into the etiology and treatment of CU behaviors from clinical research into school settings. Next, we tested whether HIA, CP, and CU behaviors uniquely and/or jointly explained variation in a range of criterion measures. We considered both variable-oriented (i.e., HIA, CP, and CU treated as continuous predictors) and person-oriented (i.e., children were distinguished based on their profile of HIA, CP, and CU behavior) strategies. Whereas variable-oriented approaches provide a way of testing the unique importance of CU (above and beyond contributions of HIA and CP), person-oriented approaches provide a more holistic approach by considering subgroups of children who differ with respect to HIA, CP, and CU behaviors. Given the emphasis on students, not variables, the person-oriented results may have greater appeal to school psychologists.

METHODS

Participants and Procedures

This study uses data that were collected at the baseline assessment for a school-based intervention study, which was approved by the University of North Carolina at Chapel Hill Institutional Review Board (study #15-0810). Details of the intervention are described elsewhere (Murray et al., In Press). Nine elementary schools were recruited near a medium-sized city in the southeast across two cohorts participating during the 2016–2017 and 2017–2018 school years. This included six schools in an urban district and three in rural counties. Schools were identified

based on principal interest following recommendation of district administrators. A two-phase process was used to identify first- and second-grade students to participate in an intervention for self-regulation difficulties. First, in the spring of the year prior to enrollment (i.e., kindergarten and first grade), teachers nominated all their students "with challenging behaviors or difficulties managing emotions, interacting with peers, and meeting behavioral expectations in the classroom." Permission forms were sent home to nominated children, and caregivers received a $5 gift card for returning them, regardless of their interest in participating. Written permission was obtained for 54% (n = 230) of 425 students who were nominated. Second, the student's new teacher completed surveys for children in the fall who returned to the same school, who had been nominated in the spring by a previous teacher, and whose parent had provided consent to participate in this study (screening sample; n = 208). Sixty percent of these students were rated by their teacher as above the "risk" threshold for current behavior problems (i.e., sum scores >12 on the Total Difficulties scale of the Strengths and Difficulties Questionnaire; Goodman, 1997) and were enrolled in the study (enrolled sample; n = 138). Children in the enrolled sample exhibited persistent behavior problems across two academic years that were evident to two different teachers. Students with autism spectrum disorder (by parent or school counselor report), full-time placement in special education classrooms, significant intellectual deficits, and nonproficiency in English (based upon school report) were excluded due to concerns that they would be unable to fully participate in treatment groups.

In the current study, we make limited use of data that were collected in the screening sample to investigate questions regarding whether teachers could differentiate CU from other domains of disruptive behavior. We used the screening sample for the first question because of the larger sample size. Subsequent analyses make use of the enrolled sample, for whom more

detailed outcomes were available (i.e., teacher questionnaires, child performance-based assessments, child report cards, and classroom observations that were obtained at the baseline assessment). Enrolled children were predominantly male (68%) and eligible for free or reduced-price lunch (FRPL; 75%). The enrolled sample was racially and ethnically diverse (61% Black, 9% Latinx, 23% White, and 7% multiracial), with a higher-than-expected number of African Americans and a lower-than-expected number of Latinx students, given the overall demographics of the schools from which students were recruited (42% African American and 30% Latinx). This may reflect potential teacher bias in overidentifying disruptive behavior in African American children in comparison to their white peers (Gregory et al., 2010; Skiba et al., 2014). The response rate of Latinx families may also be due to heightened concerns around immigration during the period of recruitment. Some Latinx students may have also been excluded due to the study requirement for students to be proficient in English. Per caregiver report (which was available for 72% of students), 29% of enrolled children had been diagnosed with an emotional, behavioral, or learning disorder (attention deficit hyperactivity disorder [ADHD] was the most common diagnosis) and 16% took medication for emotional or behavioral difficulties at some point during the school year in which these data were collected.

Measures

Predictor: CU Behaviors. CU behaviors were measured by 10 teacher-rated items (e.g., "Sometimes seems to completely lack the capability to feel guilt and remorse"; "Seldom expresses sympathy for others") on the Child Problematic Traits Inventory (CPTI). CPTI items are rated on a 4-point Likert-type scale ranging from 1 (*does not apply at all*) to 4 *(applies very much*), with higher values indicating greater CU behaviors. The CPTI was validated in two large (*N*s > 1100) samples of typically developing 3- to 5-year-olds, as well as a clinic-referred sample

of children ranging from 6 to 13 years old, which included parent and teacher reports (Colins et al., 2014; Colins et al., 2017; Colins et al., 2020). The CPTI CU scale has demonstrated good internal consistency and convergent validity, with parent and teacher rating of externalizing behavior, fearlessness, and prosocial peer interactions. We withhold reporting internal consistency for these items until they have been evaluated in a factor analysis (research question 1).

Predictor: ADHD and Oppositional Defiant Disorder Behaviors. ADHD and oppositional defiant disorder (ODD) symptoms were measured using the teacher version of the Strengths and Weaknesses of ADHD Symptoms and Normal Behavior (SWAN). Building on earlier efforts to use parent and teacher rating scales to index individual differences in ADHD behaviors, the SWAN assesses hyperactivity and impulsivity, inattention, and ODD symptoms (nine items each) consistent with the *Diagnostic and Statistical Manual of Mental Disorders* (Swanson et al., 2012). A distinguishing feature of the SWAN is the use of a seven-point Likert-type scale (i.e., from 3, *far below average* to -3, *far above average*) to capture a fuller range of ADHD and ODD behaviors than is typical of other categorically oriented rating scales (Arnett et al., 2013; Swanson et al., 2012). The SWAN has demonstrated strong internal consistency and construct validity in dozens of studies that have included preschool and school-aged children (reviewed by Brites et al., 2015). We withhold reporting internal consistency for these items until they have been evaluated in a factor analysis (research question 1).

Teacher Rated Outcome: Social Competence. The Walker-McConnell Scale (Walker & McConnell, 1995) includes the 17-item peer subscale, which assesses peer relations in social situations (e.g., “makes friends easily with other children”) and the 16-item teacher subscale, which measures sensitivity, empathy, cooperation, self-control, and maturity (e.g., “shows

sympathy for others"). Teachers responded on a 5-point Likert-type scale ranging from 1 (*never)* to 5 (*frequently*). Preliminary factor analysis in this sample did not support the distinction between peer and teacher subscales. Therefore, all items were combined to create an overall mean score of children's social competence (α = .85).

Teacher-Rated Outcome: Academic Productivity. Academic productivity was assessed by teacher report on the Academic Performance Rating Scale (APRS; DuPaul et al., 1991). Academic Productivity is a 12-item subscale that assesses percentage and accuracy of work that is assigned and completed relative to classmates. In prior work, the APRS demonstrated good internal consistency (.72–.95), stability (.88–.95), and criterion-related validity (DuPaul et al., 1991; Merriman et al., 2016). The internal consistency of the Academic Productivity subscale in this study was acceptable (α = .80).

Teacher-Rated Outcome: The Impairment Rating Scale (IRS). The IRS (Fabiano et al., 2006) is a 5-item teacher rating of a child's severity of impairment in peer relations, relationship with teacher, academic progress, classroom functioning, and self-esteem on a 5-point scale ranging from 0 *(no problem; definitely does not need intervention or special services)* to 4 *(extreme problem; definitely needs intervention or special services).* The IRS demonstrates temporal stability and construct validity with elementary samples (Fabiano et al., 2006; Girio-Herrera et al., 2015). Internal reliability in this study was high (α =.87).

Child Performance Outcome: Inhibitory Control. The *Happy-Sad Stroop* (HSS) task (Lagattuta et al., 2011) requires children to point to a happy face when the examiner says "sad" and vice versa in 20 trials following four teaching trials, with total number of errors scored (higher scores = worse performance). It is a widely used neurocognitive measure (Spreen & Strauss, 1991) sensitive to social-emotional interventions in early elementary students (Riggs et

al., 2006). The internal consistency of the total incorrect score was adequate (α = .70). Twenty percent of these assessments were double coded from videos to ensure administration fidelity (r = .89).

Child Performance Outcome: Academic Proficiency. Students' quarterly report card grades in reading, mathematics, and writing were scored as proficient or not based on a grade of "satisfactory" or at or above 75 as recommended by our district liaisons (0 = *not proficient*; 1 = *proficient*). A summary score was created to reflect the number of domains in which a student was proficient (range = 0–3). The pretest assessment reflected quarter 1 grades (prior to the start of the intervention). Report card grades are considered an ecologically valid measure of students' academic success (Perfect et al., 2014; Rasmussen & Laumann, 2013).

Office Discipline Referrals. Office discipline referrals were defined as occasions when a student was sent to the office for disciplinary action. An online entry site was created for this study to standardize definitions and methods across schools and districts, and a member of the school staff (e.g., counselor or data manager) was trained to enter discipline referrals monthly. We focus on the total number of incidents (M = 1.9, SD = 4.0, *Range* = 0–24). The most common reasons for referral were noncompliance and defiance (50%), disrupting class (33%), and physical aggression toward peers (32%). Office referrals were available from October through May of the school year.

Observational Outcome: Off-Task Classroom Behavior. Off-task classroom behavior was measured using the Revised Edition of the School Observation Coding System (Jacobs et al., 2001), based on two 10-minute observations conducted by trained observers during instructional time on different days. Off-task behavior was coded when the child did not attend to the expected classroom tasks or exhibited behaviors such as talking to a classmate or being out of

their seat. A percentage of time was calculated based on presence/absence for 10-second coding intervals divided by the total number of intervals. Off-task behavior was significantly correlated with inattention ($r = .29$, $p < .002$) in earlier work (Jacobs et al., 2001). Interrater reliability in the present study was good (intraclass correlation = .78).

Analytic Strategy

We used principal components and exploratory factor analyses to test whether early elementary teachers could distinguish CU behaviors from more traditional indicators of externalizing behavior, including inattention (IN), hyperactivity-impulsivity (HI), and ODD. Following best practice (Fabrigar et al., 1999), multiple indicators were used to determine the optimal number of factors to extract, including the Kaiser Criterion (i.e., determination of the number of eigenvalues > 1 in an unadjusted correlation matrix of items from a principal component analysis), a scree plot of eigenvalues from an adjusted correlation matrix using principal axis factoring, and parallel analysis. Factor analytic results informed the creation of mean scores that were used in all subsequent models.

We used latent profile analyses to characterize the co-occurrence of children's IN, HI, ODD, and CU behaviors. We relied on empirical (i.e., minimization of the Bayesian information criterion [BIC], Lo-Mendell-Rubin [LMR] test) and substantive (i.e., interpretability of results, class sizes) criteria to determine the best class solution (Nylund et al., 2008). We used posterior probabilities to assign children to groups for which their observed data were most similar.

We used hierarchical linear models to examine the contributions of IN, HI, ODD, and CU behaviors to school outcomes. Parallel models were estimated in which behaviors were represented as continuous scores or dummy variables that indexed profile membership. Child sex, grade, FRPL status, and English as a second language status were used as covariates in all

models. Given the relatively small sample sizes, especially for some latent profile groups, we considered both statistical significance and effect-size comparisons to inform substantive questions. We relied on graphical procedures to investigate distributional assumptions (no violations were evident) and to identify highly influential cases. Except for latent profile analyses (LPAs), which were estimated using Mplus version 8.4, all analyses were conducted using SAS version 9.3. Given the low rates of missing data for individual predictors and outcomes (≤ 5% each), we used listwise deletion methods for hierarchical linear models.

RESULTS

Structure and Organization of Teacher-Rated Disruptive Behaviors

The first research question tested the dimensionality of 37 items that were drawn from two instruments (i.e., CPT and SWAN) that included 10 CU items and 9 items each for IN, HI, and ODD. The Kaiser Criterion, scree plot, and parallel analysis results all indicated that a four-factor solution was preferable. The four-factor model with an oblique (promax) rotation resulted in a simple structure (see Figure 1). These results supported the creation of separate mean scores for IN, HI, ODD, and CU items. The internal consistency estimates for all four domains of behavior exceeded .93 (i.e., coefficient αs and ωs = .93 - .95 for IN, HI, ODD, and CU subscales).

To facilitate interpretation for behaviors that were rated on difference scales, we standardized mean scores for HI, IN, ODD, and CU, which were used as indicators in LPA models that varied from one to seven classes. The BIC criterion was minimized at a three-class solution (BIC = 1601.9, 1500.7, 1496.1, 1499.8, 1503.5, 1509.6, 1514.1 for 1-7 class solutions, respectively). Moreover, the LMR test from the four-class model did not reject the null hypothesis that a 3-class solution was sufficient, $p = .25$. A three-class solution was also deemed

useful based on substantive criteria (i.e., interpretability and size of classes). As summarized in Figure 1, 50% of children in the enrolled sample were characterized by comparatively low levels of IN, HI, ODD, and CU behaviors (n = 69; 61% male; 75% eligible for FRPL; 58% African American, 28% White, 4% multiracial, 10% Latinx). Note that the negative values for behaviors in Figure 1 convey standardized values that were less than the sample average of 0. In contrast, 14% of children were characterized by elevated IN and HI behaviors (n = 20; 80% male; 53% eligible for FRPL; 50% African American, 35% White, 10% multiracial, 5% Latinx). Finally, 36% were characterized by elevated IN, HI, ODD, and CU (n = 49; 69% male; 86% eligible for FRPL; 69% African American, 10% White, 10% multiracial, 10% Latinx). Three points are noteworthy. First, only approximately half of children who were nominated by two teachers across two school years as needing intervention services exhibited elevated IN, HI, ODD, and/or CU behaviors. Second, descriptively, the ADHD group was disproportionally male and evidenced the lowest rates of FRPL eligibility. Third, descriptively, the comorbid group was disproportionally African American and evidenced the highest rates of FRPL eligibility.

Contributions of CU Behaviors to School Functioning

Variable-Oriented Analyses. Bivariate correlations between the four focal predictors (IN, HI, ODD, CU) and criterion measures of school functioning at the pretest assessment are summarized in Table 2. Four points are noteworthy. First, the raw mean scores for the IN, HI, and ODD scales from the SWAN scale ranged from 1.2 to 1.5. Participating children were deemed by teachers to exhibit elevated (above-average) levels of disruptive behaviors, which is consistent with the sampling plan. Second, CU was strongly correlated with ODD (r = .60) but more modestly associated with IN and HI (rs = .23 and .35, respectively). HI was also strongly associated with ODD (r = .51) and IN (r = .59). Third, although all four focal predictors were

associated with impairment (i.e., IRS scale), CU and ODD were more strongly associated with social competence and discipline measures, while IN and HI were more strongly associated with academic functioning. Fourth, the four focal predictors were more strongly associated with other teacher-reported measures than they were objective indicators of school performance, likely due to shared method variance.

A series of two-level (138 children nested in 83 classrooms; *Mdn* = 1.0 and *M* = 1.7 children per classroom) unconditional hierarchical linear modeling (HLM) models indicated that children within classrooms were more similar than those across classrooms (mean intraclass correlation = .20, range = 0 to .57). Each two-level model was re-estimated to include the four focal predictors (IN, HI, ODD, CU) and demographic covariates (child sex, age, English as a second language status, and eligibility for FRPL). We standardized focal predictors (IN, HI, ODD, CU) and all outcomes (*M* = 0, *STD* = 1), which facilitated interpretation (effects are interpreted as standardized coefficients). These models provided a test of whether CU behaviors explained variation in multiple indicators of school functioning above and beyond traditional domains of disruptive behavior and demographic covariates.

As summarized in Table 3, except for the HSS task, at least one of the four focal predictors was uniquely associated with each criterion measure of school functioning. Higher levels of CU were uniquely associated with increased levels of teacher impairment and decreased levels of teacher-rated social competence. CU did not explain unique variation in any of the other criterion measure. Notably, HI was associated with multiple outcomes in the opposite direction of the other focal predictors (e.g., higher HI was associated with less impairment, more social competence, and better emotion recognition), which was indicative of regression suppression (e.g., compare the sign and direction of bivariate versus adjusted HI effects in Tables 2 and 3,

respectively). Regression suppression may have resulted from the strong correlations among focal predictors and provides indirect support for adopting a person-oriented approach. Finally, we estimated three additional models for each outcome, which tested whether the unique influence of CU on each outcome was conditional on (moderated by) IN, HI, or CP. These results were consistently null and are not reported. Notably, we omitted up to 2 influential cases from each outcome in Table 3 (cases were omitted if regression coefficients changed appreciably in magnitude, irrespective of the direction of change).

Person-Oriented Analyses. Children were classified according to the posterior probabilities from the three-class latent profile model (i.e., children were assigned the group for which their individual data were most consistent). In total, 69 children were assigned to the "reference" group, 20 children to the "ADHD" group, and 49 children to the "comorbid" group. A parallel set of HLM models to those described above were estimated with the exception that the four continuous behavioral predictors (IN, HI, ODD, CU) were replaced by a nominal classification variable (reference, ADHD, comorbid groups), with covariates unchanged. As summarized in Table 4, group was a statistically significant predictor for three teacher-rated outcomes (academic productivity, impairment, and social competence). With respect to teacher-rated impairment, pairwise comparisons indicated that children in the comorbid group were more impaired than those in the ADHD group, who were more impaired than those in the reference group (all ps < .05). For social competence, children in the comorbid group were rated lower than those in the ADHD and reference groups, which did not differ from each other. With respect to academic productivity, children in the comorbid and ADHD groups were rated lower than those in the reference group. Statistically significant group differences were not evident for other outcomes.

Small sample sizes may have obscured meaningful group differences. As summarized in Figure 2, the significant effects that were reported in Table 4 correspond to large effect sizes. Numerous small to medium-sized group differences were also evident. For example, compared to children in the reference group, children in the comorbid group performed less well on the inhibitory control task (Cohen's *d* = .42), received more school disciplinary referrals (Cohen's *d* = .28), demonstrated poorer academic proficiency (Cohen's *d* = .22), and spent more time off task (Cohen's *d* =.31). Moreover, children in the ADHD group were less academically proficient and spent more time off task than children in both the reference (Cohen's *ds* = .43 and .41, respectively) and comorbid groups (Cohen's *ds* = .21 and .11, respectively).

DISCUSSION

Elementary school teachers could distinguish CU behaviors from traditional indicators of disruptive behavior in children as young as first grade. CU behaviors explained unique variation in teacher appraisals of children's overall school functioning. Person-oriented analyses indicated that children with elevated levels of CU and other disruptive behaviors exhibited a distinct pattern of impairments in social and interpersonal functioning. These results are discussed in turn.

Although teachers could distinguish CU from ADHD and ODD behaviors, these dimensions of behavior were moderate to strongly correlated. The relatively large correlations between focal behaviors combined with the modest sample size undermined our efforts to test whether CU explained unique variance in outcomes beyond that attributable to ADHD and ODD. Nonetheless, individual differences in CU behaviors explained unique variation in teacher-rated impairment and social competence beyond that attributable to ADHD and ODD. When CU was used to help group children into distinct profiles, the group that exhibited elevated levels of

ADHD, ODD, and CU (comorbid group) exhibited profoundly worse functioning than others in areas of global impairment, social competence, school disciplinary infractions, academic productivity, and classroom off-task behavior. Many of these differences were of moderate to large magnitude, which is notable given that all children in this sample were deemed in need of treatment by two teachers across two academic years.

In school contexts, children who exhibit developmentally inappropriate levels of ADHD and CP behaviors are often classified as having an emotional disability (ED) or other health impairment, which are educational classifications that permit schools to serve children under the Individuals with Disabilities Education Act (2004), amended 2015. Children characterized as ED are understood to be heterogeneous group with respect to the type and severity of behavioral difficulties that they experience (Peiper et al., 2015). CU behaviors remain an understudied source of variation among children who are classified as ED. Children who exhibit low empathy and a lack of remorse for their wrongdoing in the context of peer conflicts, who appear insensitive to teacher efforts to redirect misbehavior, and/or who are unmotivated to participate in academic work—all characteristics of CU—will likely contribute to challenges in classroom management and are likely to experience relationship difficulties with peers and school staff.

The designation of children as ED creates opportunities for schools to provide intervention services for children. Greater awareness of individual differences in CU behaviors may warrant functional analysis of disciplinary incidents, with greater consideration of the potential contribution of CU behaviors. To the extent that CU behaviors contribute to children's disruptive behaviors or relationship difficulties, this may also inform novel approaches to intervention. For example, preliminary evidence supports the use of skills building programs in schools to prevent CP and CU behaviors (Kyranides et al., 2018). The use of daily report cards,

which are often used to treat difficulties with ADHD behaviors (Fabiano et al., 2010), may be adapted to prioritize peer and/or teacher relationship-building activities for children who exhibit elevated levels of CU behaviors. Finally, schools may host and support parent-focused behavioral interventions that have been adapted to jointly target reductions in CP and CU behaviors (Kimonis et al., 2019; Kjobli et al., 2018). The important point is that attending to heterogeneity in disruptive behaviors may facilitate a more personalized approach to treatment in school settings, which is consistent with ongoing efforts in the clinical literature (Wilkinson et al., 2016).

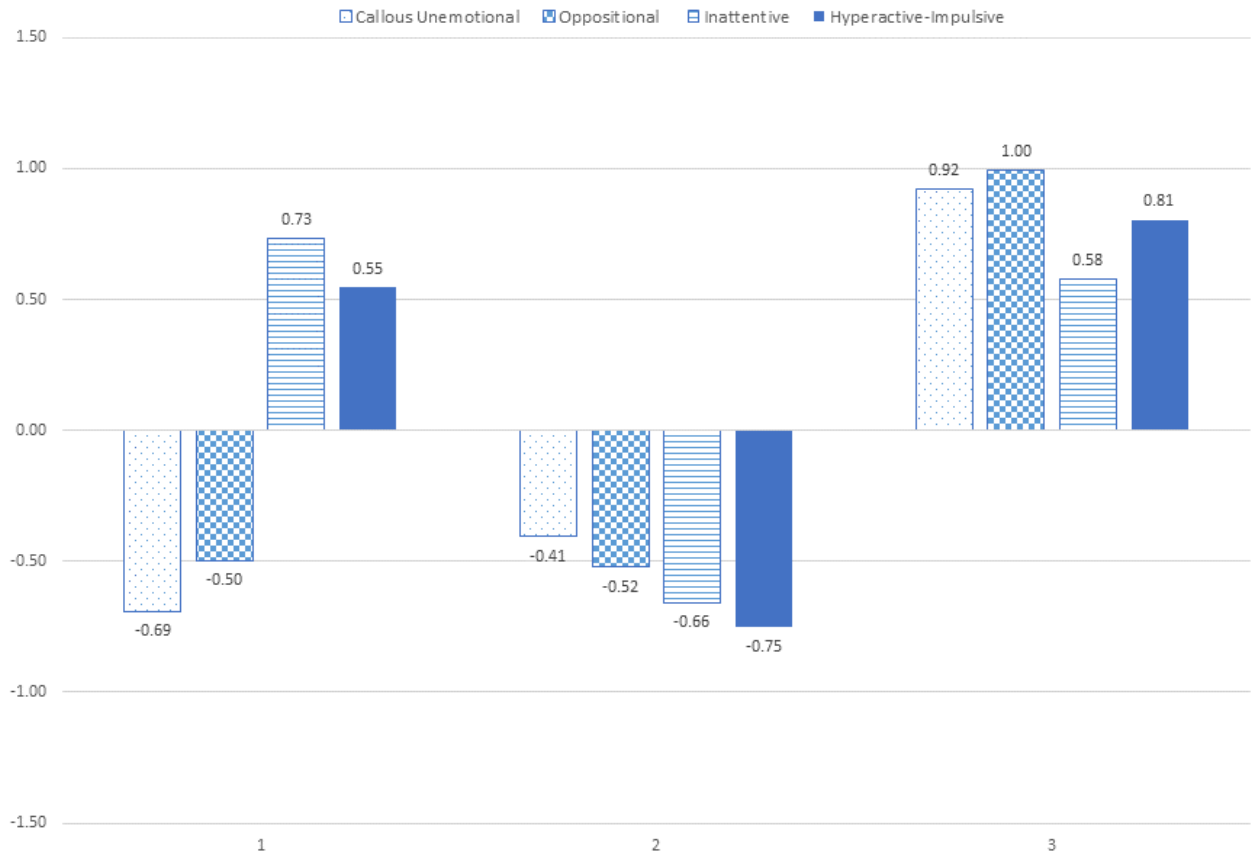
This study is characterized by at least three limitations. First, the relatively small sample size limited the ability to significantly detect small effects that may be educationally meaningful. Although our effect-size comparisons were provocative and accounted for demographic covariates, they do not provide a strong basis for inference and may be better conceived of as hypothesis generating. Second, CU and ODD behaviors were strongly correlated in this sample. Children in the comorbid group differed from those in the reference and ADHD groups with respect to CU *and* ODD behaviors. This pattern of associations limited our ability to make strong tests about the incremental value of assessing CU behaviors alongside ODD behaviors. Larger samples that include children with greater variability in behavior may be in a better position to identify ADHD+ODD and ADHD+ODD+CU subgroups and, in turn, provide stronger tests of the utility of including CU behaviors as part of an assessment of disruptive behaviors in school settings. Third, the sample-selection methods used in this study may have influenced results in unknown ways. Participating children do not represent a normative (or a convenience) sample of all first and second graders. All children were deemed to have problems that would benefit from school-based intervention by two different teachers across two school years. In some ways,

participating children are more like a clinical than a normative school sample, except parents did not seek treatment services.

It has long been known that children with disruptive behavior disorders differ with respect to their age of onset, persistence, and presentation of externalizing behaviors. Over the last 15 years, individual differences in CU behaviors have emerged as another source of heterogeneity and has helped to spur novel etiologic and intervention development work. Although much of this work has occurred in the clinical science and psychiatric literatures, it has direct relevance to school psychology researchers and practitioners. Our study provides some support for the more widespread consideration of CU behaviors in school settings. Future studies that involve larger sample sizes are needed to test this idea more rigorously. We hope that the results of this study will spur school psychologists to consider the ways that individual differences in CU behaviors may help to inform educational research and practice.

Figure 1

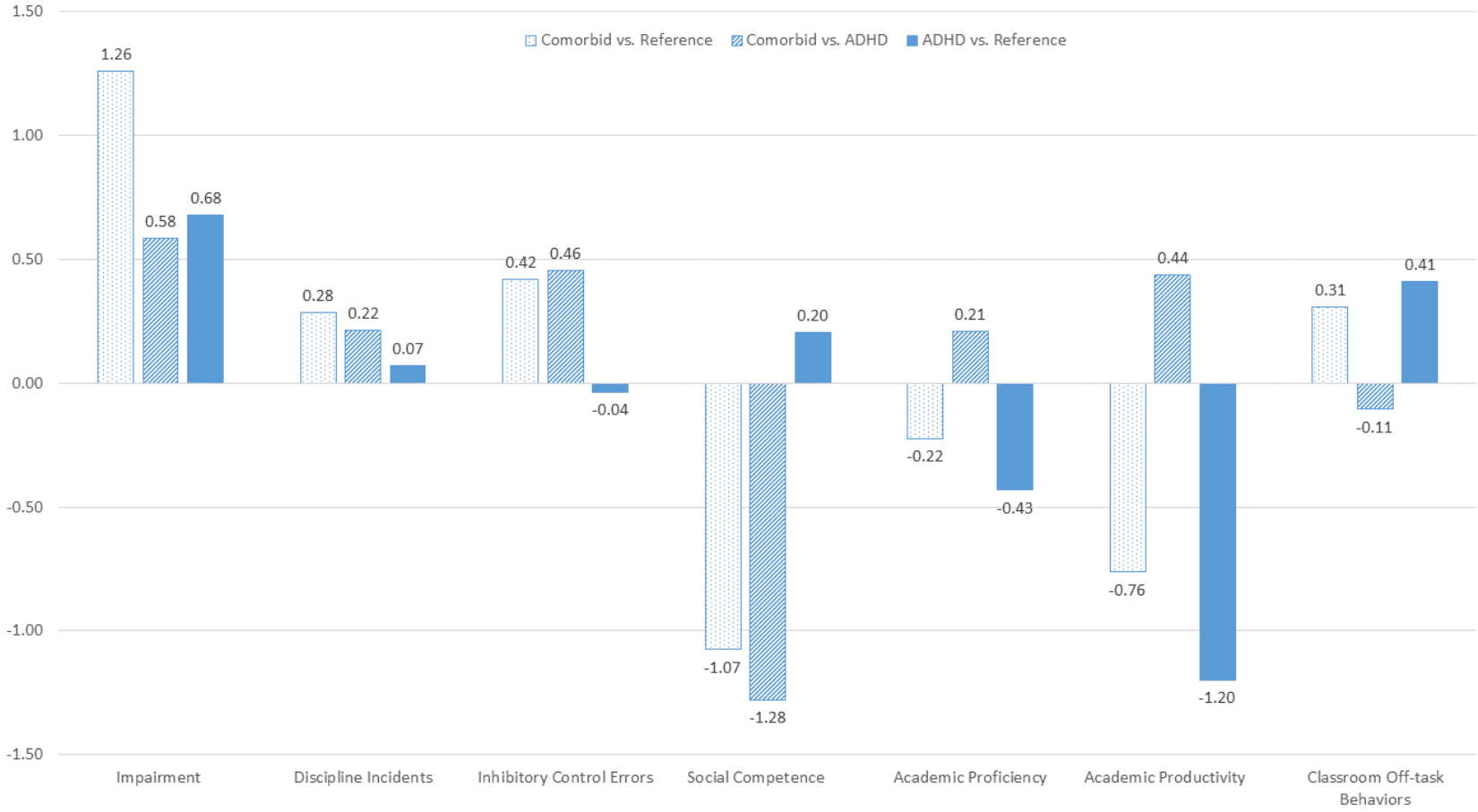
Standardized Mean Plots for Latent Profile Groups



Note. Profile 1 is defined by elevated attention deficit hyperactivity disorder behaviors (ADHD group); Profile 2 is defined by low levels of ADHD and disruptive behaviors (reference group); Profile 3 is defined by elevated ADHD and disruptive behaviors (comorbid group). Profiles 1–3 represent 17%, 49%, and 34% of the sample, respectively.

Figure 2

Standardized Mean Differences Between Latent Profile Groups



Note. Small differences existed between latent profile groups for school disciplinary infractions and academic proficiency (grades). Moderate- to large-sized differences existed between profile groups for all remaining outcomes. ADHD = attention deficit hyperactivity disorder.

Table 1

Rotated Factor Loadings

	Factor			
	CU	**IN**	**ODD**	**HI**
1. Often indifferent when others upset	**.86**	.05	.05	−.17
2. Not upset when others are hurt	**.85**	−.12	−.15	.04
3. Sometimes lacks guilt or remorse	**.83**	.05	.08	.03
4. Never expresses guilt	**.82**	.00	−.01	.13
5. Doesn't express guilt/remorse like others	**.79**	.02	.09	.05
6. Never has bad conscience	**.78**	−.02	.05	.05
7. Does not share others' joy and sorrow	**.78**	.05	.04	−.18
8. Does not care what others think and feel	**.77**	.00	−.06	.17
9. Seldom expresses sympathy for others	**.76**	−.01	.07	−.13
10. Seldom remorseful	**.75**	−.02	−.01	.06
11. Organize tasks and activities	.01	**.91**	−.09	−.00
12. Follow instructions and finish work/chores	.08	**.89**	−.04	.04
13. Engage in tasks of sustained mental effort	−.04	**.88**	.13	−.06
14. Attention to detail; avoid careless mistakes	−.03	**.88**	−.02	−.06
15. Keep track of things for activities	.00	**.83**	.01	−.01
16. Sustain attention on tasks or play activities	−.02	**.82**	−.13	.13
17. Remember daily activities	−.01	**.71**	.04	.03
18. Listen when spoken to directly	.17	**.57**	.11	.07
19. Ignore extraneous stimuli	−.08	**.51**	.17	.30
20. Control anger and resentment	−.09	.02	**1.0**	−.14
21. Control temper	−.09	.01	**.99**	−.09

	Factor			
	CU	**IN**	**ODD**	**HI**
22. Avoid arguing with adults	.03	−.11	**.82**	.11
23. Avoid quarreling	.06	−.07	**.80**	.10
24. Control spitefulness or vindictiveness	.14	−.04	**.80**	−.04
25. Assume responsibility for mistakes	.14	.07	**.66**	.06
26. Ignore annoyances of others	.02	.05	**.58**	.27
27. Avoid doing things that annoy others	.14	.10	**.46**	.28
28. Follow adult requests or rules	.21	.27	**.39**	.15
29. Settle down and rest	.05	.03	−.05	**.84**
30. Modulate verbal activity	.05	−.03	.01	**.81**
31. Play quietly	−.01	−.12	.14	**.78**
32. Stay seated	−.09	.22	−.04	**.74**
33. Sit still	−.09	.30	−.19	**.73**
34. Reflect on questions	.01	−.07	.22	**.70**
35. Modulate motor activity	−.05	.15	−.00	**.58**
36. Await turn	.08	.07	.29	**.51**
37. Enter into conversations and games	.04	.20	**.35**	**.36**
Eigenvalue	16.2	4.7	2.6	1.6
% Variance	58	17	9	6

Note. *N* = 207 (1 student from the screening sample was excluded due to incomplete item-level data). Rotation method = promax. Factor intercorrelations: CU with IN = .34, CU with ODD = .56, CU with HI = .42; IN with ODD = .36, IN with HI = .58; ODD with HI = .53. CU = callous-unemotional; IN = inattention; ODD = oppositional defiant disorder; HI = hyperactivity-impulsivity.

Table 2

Bivariate Correlations Among Focal Behavioral Predictors and Child Outcomes at Pretest

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	N	M	SD
1. CU	—											138	2.4	0.8
2. ODD	.60***	—										138	1.2	1.1
3. IN	.23**	.30***	—									138	1.5	1.0
4. HI	.35***	.51***	.59***	—								138	1.3	0.9
5. Impairment	.48***	.60***	.57***	.41***	—							138	2.5	0.9
6. Social competence	−.58***	−.60***	−.36***	−.18*	−.61***	—						138	2.8	0.7
7. IC errors	.08	.18*	.10	.16	.11	−.14	—					131	5.0	3.2
8. AC-PROD	−.19*	−.18*	−.69***	−.34***	−.53***	.38***	−.16	—				138	33.5	8.2
9. AC-PROF	−.05	.08	−.21*	.00	−.18*	.07	−.16	.31***	—			132	0.7	0.9
10. Discipline count	.13	.24**	.05	.09	.20*	−.23**	.09	−.12	−.17*	—		137	1.9	4.0
11. Class off task %	.04	.13	.21*	.17	.18*	−.08	.07	−.19*	.15	.19*	—	138	31.8	18.7

Note. CU = callous-unemotional; ODD = oppositional defiant disorder; IN = inattention; HI = hyperactivity-impulsivity; IC = inhibitory control; AC-PROD = academic productivity (rating); AC-PROF = academic proficiency (grades).

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3

Variable-Oriented Test of Behavioral Predictors of School Functioning

	Outcomes						
Predictors	**Impairment**	**Social comp**	**Discipline**	**IC errors**	**AC-PROF**	**AC-PROD**	**Off task**
CU	**.15***	**−.29*****	.00	−.01	.02	−.02	−.12
ODD	**.39*****	**−.52*****	**.30****	.15	.14	−.01	.14
IN	**.52*****	**−.45*****	−.03	.07	**−.47*****	**−.90*****	**.17***
HI	−.14	**.40*****	−.04	.07	.13	.15	.05
Male	−.06	.21	.14	−.22	.29	.14	.26
ESL	−.06	−.05	.61*	−.46	−.10	.29	−.13
Age	.02*	.01	−.00	−.01	−.00	.01*	.01
FRPL	.07	−.07	.27	.33	−.81***	−.15	−.07
N	133	132	132	129	127	133	134

Note. Social comp = social competence; IC = inhibitory control; AC-PROF = academic proficiency (grades); AC-PROD = academic productivity (rating); CU = callous-unemotional; ODD – oppositional defiant disorder; IN = inattention; HI = hyperactivity-impulsivity; ESL = English as a second language; FRPL = free or reduced-price lunch; values for CU, ODD, IN, and HI are standardized regression coefficients.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 4

Person-Oriented Test of Behavioral Predictors of School Functioning

	Test of group differences	Least square means		
Outcomes	*F* (*ndf, ddf*)	Reference	ADHD	Comorbid
Impairment	34.5 (2, 127)***	−0.55^{A}	0.13^{B}	0.71^{C}
Social competence	26.5 (2, 127)***	0.36^{A}	0.56^{A}	⁻0.72^{B}
Discipline incidents	1.2 (2, 21)	−0.10	⁻0.03	0.19
IC errors	2.9 (2, 21)$^{+}$	−0.12^{A}	⁻0.16^{A,B}	0.30^{B}
AC-PROF	2.0 (2, 20)	0.13	⁻0.30	⁻0.09
AC-PROD	19.2 (2, 127)***	0.46^{A}	⁻0.74^{B}	⁻0.30^{B}
Class off task %	2.9 (2, 22)$^{+}$	⁻0.17	0.24	0.14

Note. Ns = 129 - 134; For each outcome (row), least squares means with different superscripts indicate statistically significant pairwise comparisons, $p < .05$. If the omnibus test of group differences was not statistically significant (F test), pairwise comparisons were not considered. Covariates included child sex, age, English as a second language status, and free or reduced-price lunch status. *ndf* = numerator degrees of freedom; *ddf* = denominator degrees of freedom; ADHD = attention deficit hyperactivity disorder; IC = inhibitory control; AC-PROF = academic proficiency (grades); AC-PROD = academic productivity (rating).

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

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