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Classroom Rule Violations in Elementary School Students With Callous-Unemotional Traits

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Abstract

An emerging body of mental health research provides evidence that callous-unemotional (CU) traits explain significant and meaningful variance among children with disruptive behavior disorders. However, the classroom behavior of students with CU traits has not yet been adequately studied. This study examined this issue using teacher-recorded classroom rule violations (RVs). Participants were 648 children (346 boys; *M* age = 8.14) from 28 classrooms (kindergarten–sixth grade) distributed across three schools participating in a schoolwide behavioral intervention. Teachers completed rating scales approximately 4 to 6 weeks after the start of the school year, prior to initiating the schoolwide intervention. After completing ratings, teachers recorded daily frequency counts of RVs for each student in their classroom for the remainder of the school year. Growth curve modeling analyses indicated that (a) CU traits were associated with elevated rates of RVs at the start of the school year even after taking attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder/conduct disorder (ODD/CD) into account and (b) CU traits were associated with a significant decrease in rates of RVs across the school year. CU traits appear to explain significant and important variance in classroom RVs among elementary school age students.

Keywords

disruptive behavior disorders, classroom rule violations, callous-unemotional, ADHD, ODD, CD, conduct problems

Disruptive classroom behavior is one of the most important problems facing teachers, school psychologists, and other educational professionals because it has a considerable negative impact on teachers and schools. This was clearly demonstrated in a recent survey that reported that nearly one half of regular education teachers have thought about quitting their job because of their experience working with a student with disruptive behavior problems (Westling, 2010). The financial cost of educating students with disruptive behavior problems is also considerable, with estimates suggesting that it is 18 times higher than the cost of educating nondisruptive students (Pelham, Foster, & Robb, 2007; Robb et al., 2011). Likewise, students who display disruptive behavior in school settings also pay a price in terms of academic underachievement (Hinshaw, 1992), increased rates of drop out (Sutherland & Wehby, 2001), and rejection by peers (Coie & Dodge, 1998). As they enter adulthood, these same students are at risk of higher rates of job loss, relationship instability, and criminal behavior (Loeber, Burke, Lahey, Winters, & Zera, 2000). For example, the National Longitudinal Transitions Study–2 followed up a nationally representative sample of students classified by their schools as having a disability, including students with serious behavior problems who were classified as having an emotional disturbance. Data from this study collected up to 8 years after high school showed that the majority (75%) of students with emotional disturbance had at least one contact with the criminal justice system at some point in their lives and they were more likely to have been arrested, spent time in jail, stopped by the police, and on probation or parole (Newman et al., 2011). These studies make it clear that students with disruptive behavior problems are an important target for educational researchers.

Although research clearly demonstrates that disruptive students as a group experience negative outcomes, it is equally well established that there is considerable variance within this group (see Loeber & Stouthamer-Loeber, 1998, for a discussion). In fact, both older research (Loeber, 1982;

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Olweus, 1979) and more recent longitudinal studies (Loeber, Farrington, Stouthamer-Loeber, & White, 2008; Moffitt, 2006) demonstrate that among elementary school children with conduct problems (CPs), some portion continue to display these behaviors over time whereas others show fluctuating patterns or discontinue over the course of development. Furthermore, those individuals who display early onset, stable CPs represent a small proportion of the population but they often account for a large portion of delinquency, crime, and other types of antisocial behavior. For example, one report from the Dunedin longitudinal study (Odgers et al., 2008) found that among male children with early onset CPs, 70% (representing 24% of the general population) showed declining rates of antisocial behavior over time, with rates of adolescent delinquency and adult crime on par with control subjects. In contrast, the remaining 30% of children with early onset CPs (representing 10% of the general population) showed high and stable rates of antisocial behavior over time, with rates of adolescent delinquency and adult crime that were at least seven times higher than controls. The pattern for females was similar. These results suggest that there may be similar variance in the disruptive behavior of elementary school students. Gaining a better understanding of factors that explain this variance could lead to more accurate identification and effective intervention efforts and ultimately to better outcomes for students and schools.

One factor that may be useful in understanding variance among disruptive student behavior is callous-unemotional (CU) traits. CU traits are shorthand for an interpersonal-affective style that is characterized by a lack of empathy for others' suffering and/or a lack of guilt about one's own misbehavior (Frick & Ellis, 1999). There is now strong evidence from studies in the mental health domain that children with both CP and CU traits (CPCU) differ in important ways from children with CP who do not have CU traits (CP-only). For example, there is evidence that children with CPCU as compared with children with CP-only exhibit more severe, frequent and varied types of antisocial behavior, are less accurate in identifying negative emotions, show less physiological and behavioral reaction to negative stimuli, and may show a differential response to behavioral treatments (see Frick, Ray, Thornton, & Kahn, 2014, for a review). Based on these studies, CU traits have gained formal acceptance into the psychiatric classification of mental health disorders as evidenced by the introduction of the CU specifier (termed *limited prosocial emotions*) into the diagnosis of conduct disorder in the recently released fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*; American Psychiatric Association [APA], 2013). Somewhat surprisingly, however, little or no research has examined whether CU traits are similarly helpful in understanding CPs in educational contexts. The overarching purpose of this study is to take a first, exploratory attempt at addressing this topic.

One area where it may be especially helpful to examine CU traits is on measures of disruptive classroom behavior such as classroom rule violations (RVs). Competing hypotheses can be formulated for the role of CU traits in understanding classroom RVs. On one hand, children with CU traits seem likely to break classroom rules because they generally evidence higher rates and more diverse types of antisocial behaviors, even as compared with other children with CPs (Frick, Cornell, Bodin, et al., 2003; Lynam, 1997). For example, Frick and colleagues found that elementary school age children with CPCU, as compared with children with CP-only, displayed a greater number and wider variety of antisocial behaviors, were more likely to be aggressive, and had higher rates of contact with the police (Frick, Cornell, Barry, Bodin, & Dane, 2003). Likewise, Lynam (1997) reported that CU traits in childhood predicted greater severity and frequency of antisocial behavior when the same individuals were adolescents. These findings seem to support the hypothesis that children with CPCU are likely to break more rules in classroom settings.

On the other hand, there is reason to believe the opposite may be true; children with CP-only may break more classroom rules than children with CPCU. One reason is because of verbal abilities. Research has long demonstrated that poor verbal abilities are associated with disruptive behavior (e.g., Farrington & Hawkins, 1991; Lahey, Loeber, Burke, & Rathouz, 2002; Moffitt & Henry, 1989) and these deficits may be especially impairing in classroom settings, where verbal abilities are likely to influence the student's ability to understand classroom rules, receive positive teacher attention by responding to questions, and to diffuse emerging conflicts by nonphysical means (Moffitt, 1993). Importantly, some (but not all) evidence suggests that verbal deficits are specifically associated with CP-only rather than CPCU. For example, in a sample of children referred for treatment of CPs, children with CP-only had worse verbal abilities than children in a control group, whereas children with CPCU did not (Loney, Frick, Ellis, & McCoy, 1998). Consistent with this finding, a study of delinquent males reported that higher levels of CU were significantly associated with higher verbal abilities (Salekin, Neumann, Leistico, & Zalot, 2004). To the extent that lower verbal abilities are associated with more disruptive classroom behavior, these findings would seem to suggest that classroom RVs are likely to be elevated in children with CP-only rather than in children with CPCU.

A second reason why CU traits may not be associated with classroom rule breaking is because of impulsivity. Evidence from experimental paradigms suggests that impulsivity is more highly associated with rule breaking than it is with more overt forms of antisocial behavior such as aggression (Burt, 2012; Burt & Donnellan, 2008). The same appears to be true in classroom settings in that children with impulse control problems constitute the highest

proportion of students with high rates of classroom RVs (Pelham & Waschbusch, 2004). However, evidence suggests that impulsivity is specifically associated with CP-only rather than CPCU. For example, parent ratings of impulsivity are significantly associated with attention-deficit/hyperactivity disorder (ADHD) and CP but not CU (Haas, Waschbusch, Pelham, & Coles, 2012), and nonimpulsive forms of antisocial behavior are elevated in children with CPCU but not CP-only (Frick & Ellis, 1999; Waschbusch & Willoughby, 2008). Taken together, these findings suggest that rule breaking—arguably including classroom RVs—is highly associated with impulsivity, but children with CPCU may not be especially impulsive.

In summary, there is indirect evidence both for and against the notion that children with CU traits may be especially disruptive in classroom settings. Research that directly examines the role of CU traits in classroom behavior would begin to answer the question of whether CU traits negatively impact classroom and school functioning. Doing so may provide valuable insight into CPs in children as expressed in educational settings, just as it has in mental health settings.

In pursuing this issue, an important consideration is how to measure disruptive classroom behavior. One possibility is to use a frequency count of classroom RVs, and there are several reasons to support this approach. First, frequency counts of classroom RVs have good ecological validity as they are widely used as part of school intervention efforts (Kleinman & Saigh, 2011; Waschbusch, Pelham, Massetti, & Northern Partners in Action for Children and Youth, 2005). For example, establishing schoolwide rules is a fundamental component of schoolwide positive behavioral intervention support programs that are commonly used by schools to prevent and treat emotional and behavioral disorders (Farmer, Reinke, & Brooks, 2014; Sugai & Horner, 2002). Furthermore, RVs have frequently been used as a dependent variable in both intervention research (Evertson & Emmer, 1982; Reinke et al., 2014) and more basic research (e.g., Waschbusch, Willoughby, & Pelham, 1998). Second, classroom RVs typically have good psychometric properties, with well-supported reliability and validity as a measure of student disruptiveness (e.g., Atkins, Pelham, & Licht, 1985; Pelham et al., 2001). Third, theory and research clearly demonstrate that classroom RVs play an important role in effective classroom management (Emmer & Evertson, 1981; Emmer & Stough, 2001). Teachers who are effective classroom managers use classroom rules as a means of clarifying and communicating their expectations to students, and this in turn translates into better student behavior and achievement over the course of a school year (Evertson & Emmer, 1982; Evertson, Emmer, Sanford, & Clements, 1983). In other words, classroom rules are one means by which teachers guide students toward behaviors that are consistent with the expectations teachers have of students. For these reasons, then, classroom RVs may be an especially important and useful measure to examine in seeking to understand the classroom behavior of children with CU traits.

Of course, student classroom RVs are not static but are instead dynamic. An individual student may violate many rules one day and few or none the next day, and this day-to-day variability may continue over the course of the school year. That is, children may start the school year with low, average, or high levels of classroom RVs, and these may increase, decrease, or remain stable over the course of the school year. The potential role of CU traits in these cross-school-year trends has not been examined but there are many viable alternatives. First, as just discussed, it may be that CU traits are unrelated to elevated classroom RVs. Students with CU traits start and end the year with low rates of RVs, just as typically developing students do. Second, it may be that there is an initial "honeymoon" phase, in which students with CU traits show low rates of RVs at the start of the school year but these increase as the year progresses and they become frustrated or bored with schoolwork or the classroom routine. Indeed, boredom susceptibility has been associated with CU traits (Lynam & Gudonis, 2005). Third, students with CU traits may initially show high rates of RVs but these rates subsequently drop. For example, students with CU traits may "test the boundaries" at the start of the school year to determine what they can get away with and subsequently adjust their misbehavior downward as they (presumably) learn that there are consequences for misbehaving. This interpretation assumes that the misbehavior of children with CU traits is somewhat deliberative, and there is evidence to support this assumption (Kerig & Stellwagen, 2009; Waschbusch, King, Willoughby, & Pelham, 2009). Fourth, it may be that students with CU traits show initially high rates of RVs which show no appreciable change over the school year. Indirect evidence in support of this hypothesis comes from research showing that children with CU traits may be insensitive to standard behavioral treatments (Haas et al., 2011; Hawes & Dadds, 2005; Waschbusch, Carrey, Willoughby, King, & Andrade, 2007). Given that behavioral techniques are "standard practice" for managing the classroom behavior of elementary school students (Epstein, Atkins, Cullinan, Kutash, & Weaver, 2008) and are used ubiquitously in elementary schools (Fabiano et al., 2002), these results suggest that children with CU traits may start off the year with higher than average rates of RVs and these remain high as the children fail to respond to typical efforts to reduce their RVs. Importantly, there are as yet no data to tease apart these four, seemingly equally viable alternatives.

The purpose of this exploratory study was to examine the role of CU traits in understanding classroom behavior of elementary school age students. To do so, we conducted secondary analyses on a study that was designed to measure

the effects of a schoolwide behavioral intervention as implemented in three elementary schools. As part of that study, classroom behavior was measured using frequency counts of RVs. The RVs were operationally defined the same way across all classrooms and were recorded by teachers over the course of one school year. Given the lack of previous research on this topic and mixed findings in related areas, no a priori hypotheses were formulated. Instead, we examined these data in an exploratory fashion.

Method

Participants

Participants were 648 children (346 boys, 302 girls) from 28 classrooms (kindergarten through Grade 6) distributed across three schools in eastern Canada. The participants ranged in age from 5 to 12 years ($M = 8.14$, $SD = 2.19$). The majority of children lived with two parents (66%) and had one or two siblings ($M = 1.4$, $SD = 1.2$). The median parental education was technical school/community college and the median household income ranged from US$25,000 to US$50,000. Ethnic and racial information of participants was not collected (at the request of the participating school board), but the schools serve communities that were more than 95% Caucasian at the time the data were collected (Nova Scotia Department of Finance, 2003).

Procedure

Data were collected as part of the Behavior Education Support and Treatment (BEST) school intervention project. 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 (see Waschbusch et al., 2005, for details). The universal intervention was a schoolwide behavioral program that included (a) developing a set of student behavior rules that were defined and implemented in a standardized manner throughout all classrooms and schools, (b) procedures for recording each RV for each child each day over the course of the school year, and (c) reinforcing rule following behavior with a contingent daily positive note sent home to parents and a contingent weekly Friday afternoon fun activities. Participating schools were recruited from within a single school district by contacting principals and giving them information about the intervention project. Principals then met with their staff and subsequently contacted the project coordinator if their school wished to participate. Seven schools volunteered to participate. The present results report data from three of these schools that were randomly assigned to implement the schoolwide intervention; data from the four schools randomly assigned to the control condition are not included because they did not track student RVs, which was the primary dependent measure used in this study.

Approximately 4 to 6 weeks after the start of the school year, prior to initiating the schoolwide intervention, teachers completed behavior rating scales on each child in their classroom. Teachers were given an in-service day if they agreed to complete ratings on students in their classroom and all teachers elected to do so. On a designated day in early October, after teachers had completed the child behavior ratings, the school intervention was initiated. As part of the intervention, teachers began to inform students each time they violated a classroom rule and teachers simultaneously recorded the student's RV on a tracking form. A RV was recorded whenever a student broke one of the following rules: follow directions, raise hand and take turns, respect yourself and others, stay in assigned seat or area, use materials and possessions appropriately, work quietly. These same rules have been used in previous research on the treatment of disruptive behavior disorders (Pelham, Greiner, & Gnagy, 1998; Pelham, Massetti, & Waschbusch, 2005). At the end of each week, the RV tracking forms were collected by study staff. These procedures were implemented throughout schools and continued for the remainder of the school year. In total, RVs were collected for 35 weeks.

Measures

RVs. RVs were summed across categories and the average per day was computed within each month for each student. Across all months, the average number of RVs per day was 0.37 ($SD = 0.57$) and the monthly averages per day ranged from a minimum of 0.00 to a maximum of 5.64. Spearman–Brown split-half reliability was $r = .95$, indicating that teachers recorded the RVs reliably. Table 1 provides descriptive statistics for the average number of RVs per day during October, November, December, January, February, March, April, May, and June.

Assessment of Disruptive Symptoms–DSM-IV version (ADS-IV). The ADS-IV (Waschbusch, Sparkes, & Northern Region Partners in Action for Children and Youth, 2003) was used to measure ADHD and oppositional defiant disorder (ODD). Items on the ADS-IV consist of *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) symptoms of ADHD and ODD rated using Likert-type scales that range from 0 to 4, where lower ratings indicate the child exhibits the symptom much less than other children and higher ratings indicate that the child exhibits the symptom much more than other children. The ADS-IV also includes items to assess whether symptoms cause impairment. Symptom counts were computed by summing the number of items rated 3 or 4, indicating the child exhibited the symptom more or much more than peers, with separate scores computed for ADHD and

Table 1. Descriptive Statistics for All Variables.

Measures	*n*	*M*	*SD*	Minimum	Maximum	α
Child age	636	8.14	2.20	5	12	n/a
No. of ADHD symptoms[a]						
Inattention	622	2.07	3.05	0	9	.94
Hyperactive/impulsive	629	1.84	2.82	0	9	.93
Total	630	3.88	5.21	0	18	.94
No. of ODD/CD symptoms[a,b]						
ODD	601	0.85	1.92	0	8	.93
CD	619	0.24	0.82	0	6	.72
Total ODD/CD	620	1.06	2.44	0	13	.89
CU traits mean score[c]	625	0.12	0.44	0	3	.98
Rule violations per day						
October	445	0.44	0.65	0	3.99	.85
November	642	0.41	0.56	0	4.75	.91
December	638	0.34	0.54	0	3.97	.84
January	589	0.39	0.62	0	4.40	.87
February	588	0.37	0.58	0	5.64	.90
March	587	0.35	0.54	0	5.10	.89
April	584	0.36	0.58	0	4.72	.87
May	581	0.33	0.52	0	5.44	.90
June	418	0.28	0.48	0	3.47	.87

Note. The total sample included 648 children; sample sizes vary from this due to missing data. ADHD = attention-deficit/hyperactivity disorder; ODD/CD = oppositional defiant disorder/conduct disorder; CU = callous-unemotional.
[a]*Assessment of Disruptive Symptoms–DSM-IV version* (Waschbusch, Sparkes, & Northern Region Partners in Action for Children and Youth, 2003).
[b]*Conduct Disorder Rating Scale–DSM-IV version* (Waschbusch & Elgar, 2007). [c]*Nova Scotia IOWA Conners* (Waschbusch et al., 2004).

for ODD (see Table 1, for descriptive statistics). The psychometric properties of the ADS-IV have been supported in previous research (Waschbusch et al., 2003).

Conduct Disorder Rating Scale–DSM-IV version (CDRS-IV). The CDRS-IV (Waschbusch & Elgar, 2007) was used to measure conduct disorder (CD). The CDRS-IV consists of *DSM-IV* symptoms of CD rated using 0 to 4 Likert-type scales, where lower ratings indicate the child has never exhibited the symptom and higher ratings indicate that the child has exhibited the symptom frequently. The CDRS-IV also includes items that assess whether the symptoms cause impairment. Following procedures used in other research (Lahey et al., 2004), CD symptoms rated as "don't know" were interpreted as "not that I know of" and coded as 0 (never). Following published guidelines, symptoms counts were then computed by summing the number of items endorsed by teachers (see Table 1, for descriptive statistics). The psychometric properties of the CDRS-IV have been supported in previous research (Waschbusch & Elgar, 2007).

Nova Scotia Modified IOWA Conners (NSIC). The NSIC (Waschbusch et al., 2004) is a measure of disruptive behavior consisting of 25 items, each of which is rated using Likert-type scales that range from 0 ("*not at all*") to 3 ("*very much*"). Of relevance to this study is the CU scale, which consists of the following three items: seems to enjoy being mean, is cold or uncaring, and lacks remorse for misbehavior. The CU scale was computed by averaging these items (see Table 1, for descriptive statistics). This scale was developed specifically for this project and used as a CU screening tool because other measures of CU, such as Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and the Inventory of Callous Unemotional Traits (Frick, 2004), were not yet published when these data were collected. Because this is a new measure, we examined its psychometric properties in this and other samples in three steps. First, we computed internal consistency reliability in the present sample and found it to be high (see Table 1). Second, we examined interrater (parent–teacher) reliability in a sample recruited from a clinic for elementary school age children with CPs (n = 148; Waschbusch et al., 2007). The interrater reliability was significant (r = .40), which is nearly identical to the parent–teacher correlation reported for the APSD CU scale (e.g., Loney et al., 1998) and is higher than the average parent–teacher correlation for psychopathology ratings in general (Achenbach, McConaughy, & Howell, 1987). Third, we examined the validity of the NSIC CU scale using the APSD CU scale as a criterion measure. The two CU scales were significantly correlated in the clinic sample described above (r = .60) and in a separate sample of students recruited from

Table 2. ADHD, ODD, CD, and CU Ratings as a Function of Grouping Variables.

Group/measure	No	Yes	*F* value/χ^2 value	*p* value	Effect size
ADHD group					
Total number (% of sample)	582 (89.8%)	66 (10.2%)	—	—	—
No. of boys (% of group)	296 (50.9%)	50 (75.8%)	14.8	<.001	3.02
ADHD-inattention	1.44 (2.46)	7.38 (2.33)	348.13	<.001	1.95
ADHD-hyp/imp	1.31 (2.29)	6.32 (3.00)	263.11	<.001	1.78
ODD	0.49 (1.33)	3.92 (3.12)	256.74		1.79
CD	0.15 (0.65)	1.08 (1.45)	85.59		1.13
CU	0.04 (0.26)	0.83 (0.89)	251.85		1.80
ODD/CD group					
Total number (% of sample)	622 (96.0%)	26 (4.0%)	—	—	—
No. of boys (% of group)	328 (52.7%)	18 (69.2%)	2.73	.10	2.02
ADHD-inattention	1.86 (2.89)	6.92 (2.61)	76.96	<.001	1.66
ADHD-hyp/imp	1.60 (2.58)	7.42 (2.53)	127.47	<.001	2.06
ODD	0.56 (1.40)	7.08 (1.26)	543.41	<.001	3.40
CD	0.15 (0.65)	2.15 (1.64)	195.59	<.001	2.44
CU	0.06 (0.26)	1.59 (0.97)	560.73	<.001	3.48
CU group					
Total number (% of sample)	592 (91.4%)	56 (8.6%)	—	—	—
No. of boys (% of group)	304 (51.4%)	42 (75.0%)	11.50	<.001	2.84
ADHD-inattention	1.62 (2.63)	6.61 (3.32)	173.74	<.001	1.64
ADHD-hyp/imp	1.43 (2.44)	6.04 (3.04)	173.09	<.001	1.63
ODD	0.49 (1.32)	4.27 (3.15)	289.80	<.001	1.97
CD	0.10 (0.51)	1.60 (1.68)	228.93	<.001	1.83
CU	0 (0)	1.37 (0.71)	2,148.65	<.001	3.11

Note. Values in table are means (with standard deviations in parentheses) for continuous measures or sample sizes (with percentages in parentheses) for categorical measures. Effect sizes are standardized mean differences for continuous measures and odds ratios for categorical variables. ADHD-inattention, ADHD-hyp/imp, and ODD are number of symptoms endorsed by teachers on the *Assessment of Disruptive Symptoms–DSM-IV* (Waschbusch, Sparkes, & Northern Region Partners in Action for Children and Youth, 2003). CD represents number of symptoms endorsed by teachers on the *Conduct Disorder Rating Scale* (Waschbusch & Elgar, 2007). CU represents average score on the CU subscale of the *Nova Scotia IOWA Conners Rating Scale* (Waschbusch et al., 2004). ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder; CD = conduct disorder; CU = callous-unemotional

regular elementary classrooms (n = 208; Waschbusch & Willoughby, 2008; r = .50) supporting the validity of the NSIC CU measure.

Participant Grouping

Reflecting the normative nature of the sample, ADHD, ODD, CD, and CU scores were highly skewed. As a result, these measures were examined categorically (0 = *no*, 1 = *yes*), with each measure dichotomized independently (i.e., the same child could be elevated on multiple grouping measures). First, guidelines in the *DSM-IV* (APA, 1994) were used to create an ADHD grouping score and an ODD/CD grouping score. Specifically, students were included in the ADHD group if they had six or more inattentive symptoms and were rated as impaired by inattention *or* if they had six or more hyperactive/impulsive symptoms and were rated as impaired by hyperactivity/impulsivity. Students were included in the ODD/CD group if they had four or more symptoms of ODD and were rated as impaired by ODD *or* if they had 3 or more symptoms of CD and were rated as impaired by CD. Finally, students were included in the CU group if they had CU scores above zero. The validity of this CU cutoff was examined in a separate sample of elementary school children (Waschbusch & Willoughby, 2008). A nearly identical proportion (8.1%) of students was identified as having high CU, suggesting that it performs consistently across samples. Furthermore, groups formed using this scale and cutoff compared favorably with groups formed using the APSD CU scale, where CU was identified using a T-score ≥ 65, with an overall correct classification rate of 83.7% and a kappa of .50. This value of kappa has been described as fair to good agreement (Landis & Koch, 1977; Shrout, 1998). Table 2 summarizes the distribution of children for each of these dichotomous variables and compares them on measures used to form the groups.

Analytic Strategy

Growth curve analyses were conducted to examine the trajectory of RVs across the school year using hierarchical linear modeling (HLM; Raudenbush, Bryk, Cheong, &

Table 3. Results of Best Fitting Hierarchical Linear Models for Change in RVs Across School Year (n = 644).

Fixed effects	Par	Model A (UMM)	Model B (UGM)	Model C	Model D
Initial status ∏0i					
Intercept	γ00	0.380*** (.020)	.376*** (.020)	.208*** (.021)	.208*** (.020)
Sex	γ01	—	—	−.081* (.035)	−.080* (.036)
ADHD	γ02	—	—	.353*** (.056)	.361*** (.052)
ODD/CD	γ03	—	—	−.089 (.400)	.565*** (.084)
CU traits	γ04	—	—	.595* (.238)	.245** (.081)
ADHD × CU	γ05	—	—	−.363 (.264)	—
ODD × CU	γ06	—	—	.223 (.607)	—
ADHD × ODD	γ07	—	—	.762 (.415)	—
ADHD × ODD × CU	γ08	—	—	−.329 (.632)	—
Slope ∏1i (time)					
Intercept	γ10	—	−.011*** (.002)	−.003 (.003)	−.004 (.003)
Sex	γ11	—	—	—	—
ADHD	γ12	—	—	−.023** (.008)	−.019** (.008)
ODD/CD	γ13	—	—	−.036 (.059)	.029* (.012)
CU traits	γ14	—	—	−.031 (.037)	−.051*** (.012)
ADHD × CU	γ15	—	—	−.014 (.041)	—
ODD × CU	γ16	—	—	−.038 (.088)	—
ADHD × ODD	γ17	—	—	.079 (.061)	—
ADHD × ODD × CU	γ18	—	—	.022 (.092)	—

Note. Values in tables are parameter estimates with standard errors in parentheses. Par = parameter; UMM = unconditional means model; UGM = unconditional growth model; ADHD = attention-deficit/hyperactivity disorder; ODD/CD = oppositional defiant disorder/conduct disorder; CU = callous-unemotional.
*p < .05. **p < .01. ***p < .001.

Congdon, 2001). HLM was used because it allows for unbalanced designs so that children with incomplete RV data could be included in the analyses. As noted above, RVs were measured across 9 months during the school year. All other variables (i.e., demographics, ADHD, ODD/CD, and CU) were assessed during the fall of the school year, prior to the start of measuring RVs. Linear growth trajectories were fit using full maximum likelihood estimation with robust standard errors. The unconditional means model (UMM) and unconditional growth model (UGM) were first tested to determine whether there was sufficient variability in individuals' average scores on the dependent variable (i.e., RVs) averaged over time as well as sufficient variability in the data over time. The UGM also addressed whether the number of RVs decreased over the school year. Next, the variability in interindividual change in RVs was examined by adding our fixed factors (demographics, ADHD, ODD/CD, and CU) to predict initial levels of RVs and to predict increases or decreases in RVs across the school year. The predictors of RVs were placed in the model in a stepwise fashion and the new model was compared with the previous model using the deviance statistic when the model was nested within another model or the Akaike Information Criterion (AIC) and/or the Bayesian Information Criterion (BIC) when the model was nonnested. The model with smaller deviance, AIC, or BIC was preferred, with differences greater than 10 providing strong evidence in favor of the model with a lower AIC or BIC score (Kass & Raftery, 1995). This index has been shown to be helpful in comparing nonnested models and penalizes the model for the number of parameters which helps prevent problems with over specification (Singer & Willet, 2003). Finally, as recommended by Feingold (2009), Cohen's d effect size estimates were calculated by dividing the parameter estimate (Π0i-initial status and Π1i-slope) by the square root of the corresponding variance ($\sigma^2$0-initial status and $\sigma^2$1-slope).

Results

Overview

The UMM and UGM for children's RVs are presented as Models A and B in Tables 3 and 4. As indicated in Model A, the grand mean or fixed effect (see Table 3) for RVs was significantly different from zero along with the estimated within-person variances (see Table 4). The dependent variable also had significant between-person variances (see Table 4) that differed from zero, indicating significant individual differences in the average number of RVs. Because both variance components were not zero, additional predictors may improve model fit. The UGM in Model B shows that both initial status and slope were significantly different from zero (see Table 3). Graphically depicted in Figure 1, it is estimated that the average child had 0.376 daily RVs at

Table 4. Variance Components and Fit Statistics for Hierarchical Linear Modeling Models for Change in RVs Across School Year (n = 644).

Random effects/fit statistics	Par	Model A (UMM)	Model B (UGM)	Model C	Model D
Random effects (variance components)					
Level 1					
Within person	σ^2e	.093*** (.002)	.082*** (.002)	.074*** (.002)	.074*** (.002)
Level 2					
In initial status	$\sigma^2$0	.256*** (.015)	.250*** (.015)	.147*** (.010)	.149*** (.010)
In slope (time)	$\sigma^2$1	—	.002*** (.000)	.002*** (.000)	.002*** (.000)
Fit statistics					
Deviance		4341.98	4169.40	2762.38	2773.06
AIC		4347.98	4181.40	2804.38	2799.06
BIC		4367.57	4220.59	2937.01	2881.16

Note. Values in tables are parameter estimates with standard errors in parentheses. RV = rule violation; Par = parameter; UMM = unconditional means model; UGM = unconditional growth model; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.
*p < .05. **p < .01. ***p < .001.

the beginning of the school year with a significant decrease of 0.011 daily RVs per month. However, there was variability in children's daily RVs as evident in the significant Level-2 residual variances (see Table 4), indicating that additional Level-2 predictors may improve model fit. Fit statistics were compared to determine whether the addition of time as a Level-1 predictor improved the model. Because the UMM is nested within the UGM, the deviance statistic was used. The reduction in deviance due to the addition of time was statistically significant, $\chi^2(3) = 4{,}341 - 4{,}169 = 172$, $p < .001$. Of note, the only model that fit was a linear one (quadric and cubic trends were nonsignificant). Model C examined the main effects of ADHD, ODD/CD and CU, as well as their interactions, in the prediction of daily RVs at the start of the school year and over the school year. Given the lack of significant interactions among ADHD, ODD/CD and CU on either initial levels of daily RVs or change in daily RVs across time, the nonsignificant interactions were removed; Model D represents the final trimmed model. As seen in Table 4, comparison of the goodness-of-fit statistics between Model D and Model B (UGM) revealed a lower AIC and BIC statistic suggesting a better fit.

Demographics

No initial status or slope effects were observed in regards to grade level, classroom, or child's age, indicating no difference in the number of daily RVs at the start of the school year or in the rate of decrease over time as a function of these measures. However, sex was found to be a significant predictor of children's initial daily RVs ($\Pi 0i = -.207$, $p < .001$), showing that girls had fewer daily RVs than boys at the start of the school year. No sex differences were found in terms of the slope of daily RVs over time ($\Pi 1i = .00$, $p = .87$). Hence, the main analyses (Models C and D) controlled for children's sex.

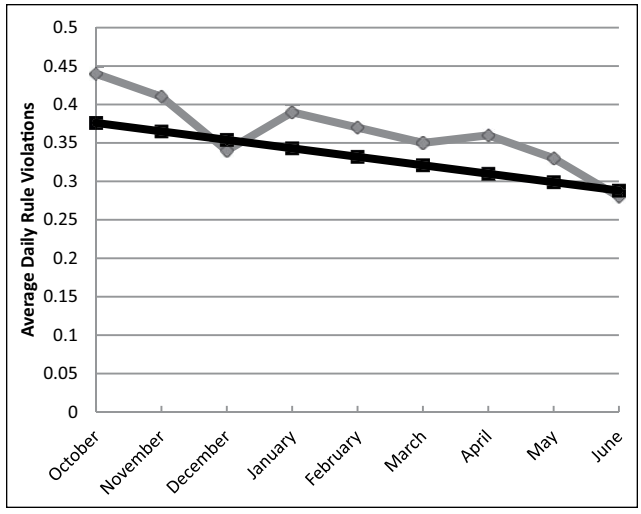

Figure 1. Average number of rule violations per day per student plotted monthly across the school year.
Note. Gray line indicates observed values, while black line depicts average growth trajectory using ordinary least squares (OLS; Singer & Willet, 2003).

ADHD, ODD/CD, and CU

RVs at start of school year. As seen in Table 3, there were significant main effects of ADHD, ODD/CD, and CU on children's initial levels of daily RVs (ADHD: $\Pi 0i = .361$, $p < .001$, Cohen's $d = 0.94$; ODD/CD: $\Pi 0i = .565$ $p < .001$, Cohen's $d = .1.46$; CU: $\Pi 0i = .245$, $p < .01$, Cohen's $d = 0.63$). These results (see Figure 2) show that children with CU, as well as children with ADHD and ODD/CD, had significantly higher levels of daily RVs at the start of the school year compared with children without these conditions. Of note is that these effects emerged even after accounting for other conditions. That is, CU traits were associated with significantly higher levels of daily RVs at

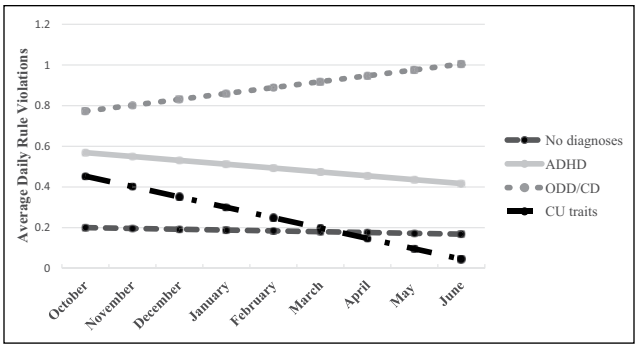

Figure 2. Average rule violations per day per student in each category (ADHD, ODD/CD, CU, no diagnoses) plotted monthly across the school year.

Note. Intercept and slope estimates for each group were taken from Model D of Table 3. ADHD = attention-deficit/hyperactivity disorder; ODD/CD = oppositional defiant disorder/conduct disorder; CU = callous-unemotional.

the start of the school year after accounting for ADHD and ODD/CD, and the same was true for ADHD controlling for ODD/CD and CU and for ODD/CD controlling for ADHD and CU.

Change in RVs across school year. As summarized in Table 4 and depicted in Figure 2, ADHD and CU were associated with a significant decrease in daily RVs across time as compared with children without these conditions (Cohen's d = −0.43 and −1.14, respectively). In contrast, ODD/CD was associated with a significant increase in daily RVs across time (Cohen's d = 0.65).

Discussion

The purpose of this exploratory study was to examine the role of CU traits in understanding the classroom behavior of elementary school age students. Classroom behavior was measured using frequency counts of RVs collected across the school year. Of most relevance to the primary purpose of this study, results showed that CU traits were associated with a significantly elevated rate of classroom RVs at the start of the school year, even after controlling for ADHD and ODD/CD, but rates of RVs significantly declined in this group as the school year progressed. These results are discussed in turn.

As shown in Table 3 and Figure 2, CU traits were associated with elevated numbers of RVs at the start of the school year. This result appears to be robust for two reasons. First, the difference emerged even after taking other measures of disruptive behavior into account, namely, ADHD and ODD/CD. This provides strong evidence that CU traits explain unique information about the classroom behavior of elementary school students. Second, effect sizes demonstrated that the difference between the CU group and other children was not trivial but was instead characterized by a medium to large effect using standard guidelines for interpreting effect sizes (Cohen, 1988). The fact that children with CU traits were meaningfully different from other children on the RV measure is consistent with mental health studies that show CU traits confer significant risk for impairment and antisocial behavior even after ADHD and ODD/CD are taken into account (Frick & Viding, 2009), including research using teacher ratings of classroom behavior (Waschbusch & Willoughby, 2008). However, this is the first study that has demonstrated this using a relatively objective measure of classroom behavior. This is an important finding for at least two reasons. First, as discussed earlier, arguments can be made both for and against the notion that children with CU traits are likely to be impaired in the classroom. The present results are first step toward resolving this debate, and do so in favor of arguments that children with CU traits are impaired in the classroom, at least on this measure of behavior. Second, classroom management research has convincingly demonstrated that "the beginning of the school year is a crucial time for establishing effective classroom management" (Evertson & Emmer, 1982, p. 485). Our results suggest that having a child with CU traits in the classroom may add to the teacher's challenge of the important task of establishing effective classroom management in elementary school settings.

Our results (see Table 4 and Figure 2) also showed that both CU traits and ADHD were associated with a significant *decrease* in the rate of RVs over the course of the school year, whereas ODD/CD was associated with a significant *increase* in the rate of RVs over course of the school year. We focus on the change over time associated with CU traits both because it aligns with the purpose of this study and because the magnitude of change associated with CU was large by conventional standards (Cohen' d = −1.14), whereas the magnitude of change associated with ADHD (−0.43) and ODD/CD (0.65) were medium. In other words, the effect size for change in RVs associated with CU was nearly twice as large as the change associated with ODD/CD (and in a different direction) and nearly three times as large as the change associated with ADHD. What might account for the large decrease in RVs associated CU traits? The answer to this question is not clear from this study, but we offer two speculative interpretations.

First, as argued earlier, the decrease in RVs over time may result from a deliberative use of antisocial behavior on the part of children with CU traits. That is, the high rate of RVs these students show at the start of the school year might reflect a "test the boundaries" approach in which they seek to determine what they can get away with in a new classroom and with a new teacher. If so, children with CPCU may learn what they can and can't get away in the classroom and adjust their behavior accordingly as the school year progresses by either eliminating the behavior that violates the classroom

rule or by developing strategies for exhibiting the behavior without getting caught. In support of this interpretation is evidence from controlled research showing that children with CPCU show more deliberate, nonimpulsive (proactive) aggression than do children with CP-only, especially in situations where they stand to gain something (Waschbusch et al., 2009). Likewise, there is evidence that classroom teachers tend to rate children with CPCU as more manipulative than other children (Kerig & Stellwagen, 2009).

A second interpretation for the decrease in RVs shown by children with CU traits is that they responded well to the schoolwide positive behavioral intervention the participating schools were implementing. Previous research on this intervention suggests that it had modest positive effects on the student body in general (Waschbusch et al., 2005), a finding that is consistent with other studies of positive schoolwide behavioral interventions (Sugai & Horner, 2002). This general trend may be especially pronounced for children with CU; that is, the positive schoolwide behavioral intervention may have been modestly effective for the student body in general, but highly effective for the subset of students with CU traits. Of note, there is evidence that children with CU traits are less responsive to typical behavioral treatments that balance reward-based strategies with punishment-based strategies (Haas et al., 2011; Hawes & Dadds, 2005; Waschbusch et al., 2007), but there is also evidence that they are responsive to behavioral interventions that emphasize reward-based strategies and de-emphasize punishment-based strategies (Miller et al., 2014). The schools in this study implemented an intervention that emphasized rewarding children's positive behaviors with teacher attention and with special privileges and downplayed attention to negative child behaviors, which may have proved an ideal fit for the children with CU traits. Unfortunately, we do not have data to test either of these explanations further; we offer these speculations in hopes of spurring future research on these topics.

There were several limitations with the study that should be noted. First, the large sample size, although necessary to obtain subsamples of children with infrequent behaviors such as those with CD, limited the ability to conduct the in-depth assessment required to make "true" clinical diagnoses. That is, while many have argued that teacher ratings are necessary for diagnosing the disruptive behavior disorders (Pelham, Fabiano, & Massetti, 2005), they are not sufficient for this purpose. Rating forms are likely to have identified some children as disordered who, upon further clinical assessment, would not have been diagnosed with a disorder, and vice versa. Second, both the main predictors (ADHD, ODD/CD, and CU) and the outcomes (RVs) were completed and/or recorded by teachers, raising the possibility of informant bias. This possibility is somewhat reduced by the fact that ratings were completed prior to collecting the dependent measure (RVs), but the concern of informant bias nonetheless remains. Third, as noted earlier, these data were collected as part of a schoolwide behavioral intervention designed to improve the functioning of the school as a whole and of individual students and teachers within the school. Evidence published elsewhere (Waschbusch et al., 2005) suggests that the intervention was at least modestly effective, which likely influenced the rates of RVs in classrooms. Thus, the results can only be safely generalized to schools implementing similar behavioral procedures. It should be noted, however, that the intervention procedures relied heavily on behavior management strategies that have become ubiquitously used in elementary school settings (Fabiano et al., 2002; Gottfredson & Gottfredson, 2001), suggesting the results are likely to generalize to a considerable number of schools. Fourth, research and theory on effective classroom management has distinguished between rules, goals, and procedures (Allen, 1986; Boekarts, de Konning, & Vedder, 2006; Emmer & Stough, 2001). Briefly, classroom goals can be conceptualized as the academic or other outcomes teachers and students are seeking to achieve, rules as the classroom conditions set up to help teachers and students to achieve these goals, and procedures as the strategies used to implement the rules. There are important differences between these different levels of classroom management, but this study did not distinguish among them. For example, "respect yourself and others" was conceptualized as a rule in this study but is perhaps more accurately described as a classroom goal. Future research would benefit from distinguishing these different aspects of classroom management. Finally, the measure of CU traits used in this study is not widely used and should be considered exploratory. This reflects the fact that the data were collected before well-established measures of CU traits were available, as well as the need to use a brief, screening measure of CU. As reported in the method section, preliminary evidence supports the reliability and validity of this measure of CU, but further research on its psychometric properties is needed if it is to be widely used. Despite these limitations, this exploratory study contributes to the literature by (a) being the first to examine the role of CU traits in understanding classroom RVs; (b) showing that CU traits are associated with significantly elevated daily RVs at the start of the school year, even after taking into account both ADHD and ODD/CD; and (c) showing that children with CU traits show a significant decrease in RVs as the school year progresses.

There are many possible directions for future research on this topic but two directions are worth emphasizing. First, there is a need for more research aimed at understanding how children with CU traits function in classroom and school settings. Numerous studies demonstrate that this group is at high risk for serious antisocial behaviors and that they differ from other disruptive children in a multitude of important ways, yet almost nothing is known about their behavior in classroom settings or nonclassroom school settings, their relationships with teachers, their academic performance, or how they respond to school interventions. Examining these and other

similar issues should be a high priority for future research as it could ultimately improve the lives of children with CU traits as well as the schools they attend. Second, and relatedly, there is a need for research on whether and how children with CU traits interface with special education services. It is currently unknown whether children with CU traits are in need of special education services and if so what services are most effective with them. Research that provides this information would improve the delivery of special education and would improve schools understanding of disruptive behavior in their students.

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