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EMPIRICAL RESEARCH

The Influence of Conduct Problems and Callous-Unemotional Traits on Academic Development Among Youth

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Abstract The present study attempted to address developmental differences within the large group of youth with conduct problems through an examination of the relationship between callous-unemotional traits and academic outcomes in an effort to expand the field's understanding of heterogeneity in outcomes associated with behavior problems. Data were collected from a cohort of 3rd grade students ($N = 942$; 51 % female; 45.6 % Hispanic/Latino, 41.1 % Black/African American, 4.7 % Non-Hispanic White; mean age = 8.07 years) in eighteen public elementary schools, as well as their parents and teachers. Hierarchical linear modeling revealed that callous-unemotional traits were associated with lower quality student–teacher relationships and worse performance on standardized math and reading exams over and above the effects of conduct problems. These findings suggest that school-based interventions may be particularly effective in ameliorating some of the deficits noted within this subset of youth exhibiting conduct problems. This finding has important policy implications as the field of developmental science attempts to design and enrich programs that focus on improving social-emotional learning.

Keywords Callous-unemotional traits · Student–teacher relationship · Academic achievement · Conduct problems

Introduction

The presence of callous-unemotional traits among youth exhibiting conduct problems has emerged as an affective, interpersonal, and behavioral risk at all ages (see Frick and White 2008 for a review). Children with high levels of callous-unemotional traits demonstrate a particularly severe form of disturbance with unique etiological and prognostic factors that differentiate them from other youth with conduct problems (Frick and White 2008). Like early onset conduct problems, children exhibiting callous-unemotional traits often demonstrate particularly severe and chronic antisocial behavior, over and above that of children with late-onset conduct problems (Frick and Dickens 2006), and are often less amenable to treatment and intervention (Kimonis et al. 2006). In addition, they lack the empathy and guilt found in youth exhibiting conduct problems without callous-unemotional traits and often engage in manipulative behaviors against others to reach self-serving goals (Kimonis et al. 2004). While previous research suggests that youth exhibiting conduct problems with callous-unemotional traits demonstrate particularly severe correlates across multiple domains of functioning, the present study aims to contribute to this body of research by examining whether callous-unemotional characteristics uniquely account for poorer performance in the academic domain—an area that has yet to be studied in relation to callous-unemotional traits—over and above academic

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performance problems typically observed among youth exhibiting conduct problems. Specifically, this study examines differences in the quality of student–teacher relationships and academic achievement for youth with varying levels of conduct problems and callous-unemotional characteristics. Given the importance of early school success in establishing healthy emotional, behavioral, and interpersonal developmental trajectories, as well as later academic achievement, findings from this study may help to identify youth who could benefit from early intervention.

Developmental Outcomes for Youth Exhibiting Conduct Problems with and without Callous-Unemotional Traits

CU traits are recognized as deficits in affective, interpersonal, and behavioral characteristics. Children with CU traits exhibit a lack of empathy and guilt, show a decreased sensitivity to punishment cues (Frick and White 2008; Kimonis et al. 2004), express less negative affect when disciplined, and show deficits in processing negative emotional stimuli in all settings including emotional language, words, and sounds (Anastassiou-Hadjicharalambous and Warden 2008). Children with CU traits display arrogance and remorselessness in interpersonal interactions. They frequently engage in manipulative use of others for personal gain, and their interactions are characterized by a superficial charm that can mask an underlying deceitful and uncaring attitude (Obradovic et al. 2007). They frequently violate the rights of others and act against parental and societal norms (Wootton et al. 1997). They also typically demonstrate a preference for novel, exciting, and dangerous activities, but display a lack of motivation for engaging in prosocial or antisocial activities from which they do not directly benefit (Kimonis et al. 2004). CU traits are often highly correlated with CP (Frick and White 2008).

Childhood conduct problems are associated with a host of maladaptive outcomes across the lifespan, including continued antisocial behavior and poor interpersonal relationships, as well as academic problems in childhood and adolescence (Holmes et al. 2001; Moffitt 1993). To more effectively address these poor developmental outcomes for children with conduct problems, it is important to understand whether and how this population of children varies in symptomatology and developmental course, as this may be key to understanding how children with conduct problems differ in response to various treatment or intervention techniques. For youth exhibiting conduct problems, research suggests that identification of the presence or absence of callous-unemotional traits has become an important tool that can help with understanding the development of psychosocial and behavioral problems, not unlike subgrouping youth exhibiting conduct problems based on age of onset [see Moffitt (1993) or Bassarath (2001) for a review of this subgrouping].

Like early- versus late-onset conduct problems, differences have been reported in the types of aggressive behavior between youth with and without callous-unemotional traits (Kimonis et al. 2006). Children with callous-unemotional traits are prone to engage in premeditated violence, often involving instrumental aggression for personal gain (Kimonis et al. 2006). In fact, callous-unemotional traits have been found to moderate the association between conduct problems and type of aggression—such that those with only conduct problems exhibit primarily reactive aggression while those with both conduct problems and callous-unemotional characteristics exhibit both proactive and reactive aggression (Frick and White 2008; Waschbusch and Willoughby 2008). If callous-unemotional traits in youth remain untreated, these aggressive patterns often continue into adolescence and adulthood, manifesting in serious behavioral disturbances (Bassarath 2001; CPPRG 1999).

Left untreated, conduct problems can lead to more serious deviant behaviors with age, including formal diagnoses of conduct disorder and/or antisocial personality disorder. For youth who exhibit these early behavior problems, the co-occurrence of callous-unemotional traits in childhood is strongly associated with adult psychopathic characteristics (Frick and White 2008)—often considered to be a more severe form of antisocial personality disorder (American Psychiatric Association 2013). It is therefore thought to be these callous-unemotional traits that differentiate psychopathic characteristics from other forms of antisocial behavior (Dadds et al. 2005; Essau et al. 2006). This differentiation suggests that youth exhibiting conduct problems with and without and callous-unemotional traits may also have distinct behavioral trajectories and outcomes.

Youth exhibiting conduct problems also differ in their ability to socialize with peers. Those who are capable of sustaining social relationships are referred to as socialized, while youth who are incapable of maintaining them are referred to as undersocialized (Christian et al. 1997). Youth with both conduct problems and callous-unemotional traits are more likely to engage in antisocial behaviors alone, and are therefore often categorized as undersocialized (Frick and Ellis 1999). It is possible that a distinction may be made by presence of callous-unemotional traits that differentiates these youth from others exhibiting conduct problems who may engage in more delinquent peer group antisocial behavior (Kimonis et al. 2004).

Differences in Academic Achievement for Youth Exhibiting Conduct Problems with and without Callous-Unemotional Traits

Youth exhibiting conduct problems typically perform worse on standardized achievement tests and are at higher risk for school dropout than their peers (Arnold 1997). They often show higher levels of behavioral and emotional disengagement in school settings and higher levels of school failure (Elias and Haynes 2008), with estimates for community samples of children falling between 10 and 50 % and even higher estimates among clinical and juvenile justice samples (Reinke et al. 2008). Conduct problems and academic achievement are relatively stable characteristics throughout the formal school years, with negative correlations throughout elementary school growing in magnitude over the early years of school and stabilizing by 3rd or 4th grade (Arnold 1997; Bohart and Stipek 2001). Given that youth with both conduct problems and callous-unemotional traits typically demonstrate more chronic and severe antisocial behavior than youth with conduct problems without callous-unemotional traits (Frick and White 2008), there is reason to believe they may be at even greater risk for academic underachievement. Differences in academic performance based on the presence or absence of callous-unemotional traits, over and above conduct problems, have not yet been examined. Investigating whether such differences exist may be important in designing treatment for subgroups of youth with behavioral issues, given that previous research suggests that early academic achievement plays a major role in later school and job performance (e.g., Roorda et al. 2011), and that underachievement is associated with a host of maladaptive economic and behavioral outcomes.

Teachers can unintentionally hinder the academic development of children with conduct problems through failure to recognize their cognitive, social, and emotional competencies (Pianta 1999; Bub et al. 2007). Teachers have been found to contribute to the problems of such youth by providing fewer learning opportunities—one study found that teachers were less likely to question, call on, or provide information to these students (Arnold 1997). Furthermore, teachers can become overly controlling, harsh, and withdrawn in order to manage the frustration caused by youth whose behavior may be frequently disruptive (Arnold et al. 2006). In short, negative relationships between youth exhibiting conduct problems and their teachers can exacerbate both behavioral and academic problems. Given that youth with both conduct problems and callous-unemotional traits are less likely to respond to emotionally evocative stimuli (i.e., lack of empathy, guiltlessness), teacher encouragement or punishment may have little to no effect on their academic performance. It is important, however, that the relationship between callous-unemotional traits and academic achievement be considered for youth exhibiting conduct problems.

Differences in Interpersonal Relationships for Youth Exhibiting Conduct Problems with and without Callous-Unemotional Traits

Youth exhibiting conduct problems demonstrate difficulties in interpersonal relationships across multiple settings. Conduct problems across childhood and adolescence have been associated with experiences of poor, ineffective parenting (Hill 2002), and youth exhibiting conduct problems with higher levels of callous-unemotional traits appear to be less impacted by ineffective parenting than those with lower levels of callous-unemotional traits (Larsson et al. 2008; Kimonis et al. 2004; Waschbusch and Willoughby 2008). While research has examined differences in parent–child relationships for youth with varying levels of conduct problems and callous-unemotional characteristics, other key interpersonal relationships, such as those with teachers, to date have not been examined.

Strong student–teacher relationships at all developmental time points promote adjustment and learning (Hamre et al. 2008). Youth who experience positive interpersonal relationships with teachers report enjoying school more and get along better with peers (Myers and Pianta 2008). They typically demonstrate better emotional regulation, social skills, and self-perceptions (Rhodes and Lowe 2009), and decreased disciplinary problems (Crosnoe et al. 2004). However, for children with conduct problems who are more likely to have experienced ineffective parenting, forming close, supportive student–teacher relationships can be more difficult (Myers and Pianta 2008), and strains placed on student–teacher relationships, such as behavioral issues in the classroom setting, often contribute significantly to their school-related difficulties (Pianta 1999). In fact, a relationship with a teacher characterized by high levels of conflict and controlling interactions is a risk factor for maladjustment in school for children. While some teachers are successful in establishing and maintaining positive relationships with behaviorally difficult children, many often have low tolerance for aggressive and socially defiant behavior, making children with conduct problems more likely to experience relationships with teachers lacking in closeness and warmth and characterized instead by angry, critical, and punitively oriented interactions (Hughes et al. 1999). Youth with conduct problems are especially sensitive to student–teacher relationship quality (Split and Koomen 2009); however, due to their frequent disruptive behaviors, these children are usually unable to foster positive relationships. Mismatches between the interactional styles and needs of children with

conduct problems and teacher expectations and discipline approaches make positive student–teacher relationships difficult to develop and maintain (Hughes et al. 1999).

Although little is known about relationships between teachers and youth with callous-unemotional traits, it is possible there are important differences from the relationships teachers have with youth without callous-unemotional traits. The more severe aggressive and antisocial behaviors of youth with both conduct problems and callous-unemotional traits (Kimonis et al. 2006; Waschbusch and Willoughby 2008) may lead to higher levels of classroom conflict and lower quality student–teacher relationships than for youth exhibiting conduct problems without callous-unemotional traits. For youth with conduct problems, close and accepting relationships with teachers are thought to act as ameliorative influences on social and emotional development, and promote academic success (Hughes et al. 1999). Due to the frequent interactions teachers have with these youth throughout the school year, they are in a unique position to provide guidance and support to children displaying conduct problems (Split and Koomen 2009; Hughes et al. 1999). It is unclear, however, whether all children with conduct problems can form and maintain positive relationships with teachers. Due to the reduced emotional responsivity to stimuli of youth with both conduct problems and callous-unemotional traits (Anastassiou-Hadjicharalambous and Warden 2008), teacher feedback and support may be met with different responses from these children than from youth with only conduct problems. Instead of changing their behavior to avoid negative interactions with teachers, youth with both conduct problems and callous-unemotional traits may show little reaction or change, which may in turn further strain the relationship. Research into trajectories of student–teacher relationships can enable us to see how children exhibiting conduct problems with and without callous-unemotional traits differ. It is possible that the behavioral and interpersonal differences in children with both conduct problems and callous-unemotional traits may interfere with their ability to benefit from positive relationships with their teachers.

The Present Study

There is evidence that children exhibiting conduct problems comprise a heterogeneous population and a better understanding of affective differences within this group may enable more effective intervention and treatment planning and implementation. The present study attempts to identify heterogeneity among a subsample of youth exhibiting conduct problems based on the presence or absence of co-occurring callous-unemotional traits, and examines differences in key developmental outcomes between these two groups. Data for this study were collected in the fall and spring of one school year among a racially/ethnically diverse cohort of 3rd grade students in eighteen urban public elementary schools. Specifically, the present study examines whether callous-unemotional characteristics explain variation at the end of the school year in student–teacher relationship quality and academic achievement over and above the effect of conduct problems for children with differing profiles of uncaring and callousness characteristics and empathy. In the academic arena, researchers have not previously assessed potential differences between youth exhibiting conduct problems with and without callous-unemotional characteristics in these academic outcomes. It was hypothesized that youth exhibiting both conduct problems and callous-unemotional traits would show lower academic achievement and lower quality student–teacher relationships at the end of 3rd grade compared to youth exhibiting conduct problems without callous-unemotional traits.

Methods

Participants

The present study included 942 3rd grade students (51 % female; average age in fall of 3rd grade = 8.07 years, SD = 0.70 years) and their 85 classroom teachers and 799 parents from eighteen New York City public elementary schools that participated in a school-randomized trial of a social-emotional learning and literacy intervention implemented over three consecutive school years. Given that intervention impacts are not the focus of the present study, school intervention status was included as a covariate in all analyses but is not reported here [for a detailed description of the intervention and its impacts on child outcomes across the first and second years of the study see Jones et al. (2011)].

Data for the present study were collected from students and teachers in fall 2004 (baseline) and spring 2005 (follow-up) of the first year of the overall evaluation when students were in 3rd grade. Fifty-nine (6.3 %) of the original 818 students left a participating school between baseline and follow-up primarily due to student relocation, although the sample size ultimately increased at follow-up due to the entry of 124 new student enrollees who received parental consent to participate in the study.

Based on parent-reported data and data collected from the local Department of Education (when parent-report data were missing), students were of multiple racial/ethnic backgrounds, including 45.6 % Hispanic/Latino, 41.1 % Black/African American, 4.7 % non-Hispanic White, and

8.6 % representing other racial/ethnic groups. Parent-reports indicated that 53.4 % ($n = 503$) of students lived in single parent households, 15.1 % ($n = 142$) of children's parents were unemployed, 31.0 % ($n = 292$) of children's parents had less than a high school diploma or GED, and 61.8 % ($n = 582$) of children's households were at or below 100 % of the federal poverty level.

Procedure

Prior to the beginning of the overall study, IRB approval was obtained and consent forms in English and Spanish were sent home to the parents of all 3rd grade students in the 18 participating schools. The overall consent rate was 64.5 % across schools (range 44–79 %). Students who were not consented either refused to participate, could not be reached by the research team, or were rendered ineligible due to language barriers or student special needs. While non-consented students were more likely to be male (Cohen's $d = .15$) and have higher absences (Cohen's $d = .21$) compared to consented students, these differences were small, and no differences were found for racial/ethnic status, receipt of free lunch, number of suspensions, and New York state reading and math test scale scores. Taken together, this suggests the participating population of children constitutes a representative sample of children from the 18 study schools.

Data were collected from students in both the fall and spring of Grade 3 during school hours via classroom administration of surveys in small class groups (5–20 students). Teams of 2–3 research staff members read all survey questions aloud and asked students to answer independently, providing them with one-on-one assistance when necessary. Children without parental consent worked on an alternate activity with their classroom teacher during survey administration periods. Teachers completed questionnaires during non-school hours about each consented student in their class at each data collection wave and were compensated at the union-based wage of $36.50 per hour for their time completing surveys.

Measures

Although data for all of these constructs were collected in both fall 2004 and spring 2005 (with the exception of math and reading achievement scores), the present study focused on predictors and outcomes in spring 2005. Measures of conduct problems and callous-unemotional traits from fall 2004 were included in all main analyses as covariates, however, to assess how change in these constructs across the school year (i.e., residualized change) was associated with spring outcomes.

Student–Teacher Relationship Quality

Teachers rated the degree of Closeness (8 items, e.g., "I share an affectionate, warm relationship with this child.", $\alpha = .79$), Dependency (5 items, e.g., "This child reacts strongly to separation from me.", $\alpha = .77$), and Conflict (7 items, e.g., "This child easily becomes angry with me.", $\alpha = .94$) in their relationship with each student in their classroom on the Student–Teacher Relationship Scale (STRS; Pianta 2001). Items were rated on a 5-point scale (1 = Definitely does not apply to 5 = Definitely applies).

Math and Reading Achievement

Standardized math and reading test scores were obtained from the New York City Department of Education based on tests administered in the spring of students' 3rd grade year (spring 2005, follow-up).

Conduct Problems

Childhood conduct problems (CP) were rated by teachers using the Behavioral Assessment System for Children—Conduct Problems (BASC-CP; Kamphaus and Reynolds 1998). Teachers rated 11 items (e.g., "Shows a lack of concern for others' feelings.") regarding the frequency with which the behavior was observed within the past 30 days. Items were rated on a 4-point scale (1 = Never to 4 = Almost always). Internal consistency for the composite scale was high ($\alpha = .83$).

Callous-Unemotional Traits

Specific items used to assess callous-unemotional (CU) traits were selected from a number of measures included in the overall evaluation study based on their content similarity to items from two published and well validated measures of CU traits: the Inventory of Callous-Unemotional Traits (ICU; Frick 2004) and the Childhood Psychopathy Scale (CPS; Lynam 1997). Specifically, items were drawn from the child-reported Children's Empathic Attitudes Questionnaire (Funk et al. 2008), and the teacher-reported Social Competence Scale (CPPRG 1999), Behavioral Assessment System for Children—Aggression subscale (BASC—A; Kamphaus and Reynolds 1998), Responsibility Scale (IES/CDC 2003) and Index of Teaching Stress (Green et al. 1997). A description of these measures and the number of items drawn from each for the assessment of CU traits follows.

Empathic Attitudes

Sixteen items comprising the latest version of the child-reported Children's Empathic Attitudes Questionnaire (Funk et al. 2008) (e.g., "When I'm mean to someone, I usually feel bad about it later.") were included in this study. Items were rated on a 3-point scale (1 = Yes, 2 = Sometimes, 3 = No).

Social Competence

Five out of 12 items from the teacher-reported Children's Social Competence Scale (CPPRG 1999) were selected for this study, 3 out of 7 from the Prosocial Behavior subscale ("Expresses needs and feelings appropriately.") and 2 out of 5 from the Emotion Regulation subscale ("Accepts legitimate imposed limits."). Items were rated on a 4-point scale (1 = Never to 4 = Almost always).

Aggression

One item (out of 13) from the teacher-reported Behavioral Assessment System for Children (BASC; Kamphaus and Reynolds 1998) aggression subscale was selected for use in this study ("Is critical of others."). Items were rated on a 4-point scale (1 = Never to 4 = Almost always).

Responsibility

Four out of 8 items from the teacher-reported Responsibility Scale (IES/CDC 2003), developed specifically for use in the overall evaluation study, were selected for the present study. Teachers were instructed to rate the level of responsibility each student demonstrated in the classroom (e.g., "Apologizes when he/she has done something wrong.") over the past 30 days on a 4-point scale (1 = Never to 4 = Almost always).

Teaching Stress

Two out of 32 items from the Index of Teaching Stress (Green et al. 1997) were selected for use in the current study. Teachers rated the degree to which they found problematic behaviors to be stressful or frustrating on a 5-point scale (1 = Never stressful to 5 = Very often stressful). Items were selected only from the Emotional Liability/Low Adaptability (e.g., "This student is usually in a bad mood.") and Aggressive/Conduct Disorder (e.g., "This child does things that bother me just to be mean.") subscales.

Only items that could be mapped directly onto specific items from the ICU and/or CPS based on having the same or similar wording were used. Following the selection of these items, an exploratory factor analysis was conducted to determine what, if any, underlying structures exist for this set of items that are consistent with component subscales of the ICU. Principle components analysis was conducted utilizing a promax rotation. Promax rotation was used because it is assumed that the underlying factors are moderately correlated and the sample size was relatively large (Mertler and Vannatta 2010). The analysis produced a two-component solution, the first accounting for 56.40 % and the second for 11.04 % of the total variance in the original variables. Eigenvalues for both components were above 1 ($\psi = 6.77$ and 1.33, respectively), indicating that a two-factor solution provided the best fit for these items. This analysis was repeated with forced one-component and three-component solutions, and the resulting complex loadings and eigenvalues for both forced solutions demonstrated worse fit, providing further support for the two-component solution. Component 1 consisted of seven of the twelve total items—five from the Social Competence Scale and two from the Responsibility Scale. These items all had positive loadings (range .54–.95) and represented positively worded items (e.g., "Apologizes when he/she has done something wrong.") that mapped directly onto items from the Uncaring subscale of the ICU (e.g., "Apologizes ("says sorry") to persons he or she has hurt."). Reverse coding these items, this component was considered to represent a dimension of Uncaring. Component 2 consisted of the remaining five items—one item from the BASC-Aggression subscale, two items from the Responsibility Scale, and two items from the Teaching Stress Scale. These items (e.g., "This student seems to have no guilt after misbehavior.") all had positive loadings (range .66–.92) and mapped closely onto items from the Callousness subscale of the ICU (e.g., "Shows no remorse when she or he has done something wrong."), thus this component was labeled Callousness. Again, all seven items in the Uncaring component were reverse-scored so that across all items in both components, a high score indicated higher CU traits. Given that the response scales differed across the measures from which these items were taken, all items were standardized before creating the composite CU scales of Uncaring and Callousness. High levels of uncaring and callousness on these composite scales were significantly associated with lower self-reported altruism (Solomon et al. 2000; β's = −.13 and −.16, p's < .001) and higher self-reported aggression (Orpinas and Frankowski 2001; β's = .20 and .20, p's < .001) and delinquency (Loeber and Dishion 1983; β's = .18 and .16, p's < .001) when controlling for sex, race/ethnicity, and poverty status. These associations are similar to those found between these constructs and scores on the ICU (e.g., Frick et al. 2014; Sakai et al. 2012), providing support for the construct validity of these scales.

Given the mapping and consistency of these two scales with two of the three subscales on the ICU—Uncaring and Callousness, the child-reported Children's Empathic Attitudes Questionnaire was used to assess the third subscale of the ICU, Empathy. All Empathy items were reverse-scored so that a high score indicated lower empathy. Thus, on all three subscales, high scores indicated higher presence of CU traits. Reliability coefficients were calculated for the Uncaring, Callousness, and Empathy subscales and all demonstrated high internal consistencies at baseline ($\alpha = .91$, .88, and .81, respectively) and follow-up ($\alpha = .91$, .89, and .83, respectively). The final set of items used to assess CU traits based on the results of the exploratory factor analysis and internal reliability analyses are presented in Table 1.

Results

Preliminary Analyses

Descriptive and internal consistency statistics for all study constructs are presented in Table 2. To represent discrete groups of children with different callous-unemotional (CU) trait profiles, two sets of dummy variables were computed. In part because these factors were assessed by different reporters (Uncaring and Callousness by teacher and Empathy by child), each factor was first dichotomized (based on mean splits, given that all were normally distributed), and then two profiles were established representing: (1) students rated by teachers as high in Uncaring and Callousness and rating themselves as low on Empathy, and (2) students rated by teachers as high in Uncaring and Callousness and rating themselves high on Empathy. Then, dummy variables were created for each of these profiles to compare each one to all other children in the sample. These two sets of dummy variables represent two different conceptualizations of CU traits in the present study and both were used in analyses to determine whether there is corroboration between teacher and student reports of factors associated with CU and how these profiles, over and above conduct problems (CP), are associated with student–teacher relationship quality and academic achievement, and in particular, whether empathy plays a significant role in these relationships. Although it is often more compelling to include continuous predictors in examining the relationship among such constructs (e.g., MacCallum et al. 2002), in this instance dichotomizing these variables allowed us to consider youth with different profiles of CU characteristics to determine whether empathy played a unique role in these relationships. While using a split point of one standard deviation above the mean would have provided a more accurate portrayal of children high in CU than using a mean split point, with the study sample this resulted in too few cases designated as high-CU to obtain accurate results in the main study analyses.

Descriptive analyses of the two CU trait profiles demonstrated that 130 children (17.08 %) were rated as high (above the mean) in uncaring and callousness and low (below the mean) in empathy and 120 children (15.77 %) were rated as high in uncaring, callousness, and empathy. While these prevalence rates for CU traits are significantly higher than those reported in previous studies, they are not surprising given that the dummy variables were created based on mean splits of each of the constructs. There were no significant differences between the two CU groups by gender ($\chi^2 = 0.99$, $p = .32$), race ($\chi^2 = 4.08$, $p = .25$), or poverty status ($\chi^2 = 0.00$, $p = .96$). The remaining 692 youth made up the referent group. Descriptive analyses of CP with the present sample demonstrated that 59 children (6.00 %) scored above the standardized cut-off that designates children who can be classified as high CP (Kamphaus and Reynolds 1998). This is comparable to prevalence rates of CP reported in previous studies for elementary school children (e.g., Bassarath 2001; Moffitt 1993). Correlations for all study variables in spring 2005 are presented in Table 3. Student–teacher relationship quality and child academic achievement varied significantly by child gender, race/ethnicity, and poverty status (see Table 4), therefore these factors were included in all analyses as covariates.

Hierarchical Linear Models

Hierarchical linear modeling (HLM; Bryk and Raudenbush 1992) was used to assess whether CU characteristics explain variation in student–teacher relationship quality and academic achievement over and above the effect of CP. HLM accounts for the nested structure of the data (i.e., children nested in classrooms), allowing for examination of both between-children and between-classroom variation in outcomes. First, unconditional models were run to assess variability between children (i.e., within classrooms) and between classrooms for all study outcomes. Identical models were run for each of the study outcomes; for example:

$$\text{Level 1} \quad Y_{ij}\ (\text{Student–Teacher Closeness}) = \beta_{0j} + r_{ij}$$
$$\text{Level 2} \quad \beta_{0j} = \gamma_{00} + \gamma_{01}\ (\text{Classroom Teacher}) + u_{0j}$$

This is followed by a set of two-level models (child, classroom) examining the relationship in spring of 3rd grade between CU profiles and student–teacher relationships and academic achievement over and above the effects of CP, and controlling for CP and CU trait profiles in fall of 3rd grade, for example:

Table 1 Items included in the callous-unemotional trait profiles

Uncaring ($\alpha = 91$)	Origin	Loading
Can accept things not going his/her way (R)	Social Competence Scale	.54
Accepts legitimate imposed limits (R)	Social Competence Scale	.67
Expresses needs and feelings appropriately (R)	Social Competence Scale	.83
Apologizes when he/she has done something wrong (R)	Responsibility Scale	.79
Is aware of the effect of child's behavior on others (R)	Social Competence Scale	.95
Listens to others' points of view (R)	Social Competence Scale	.90
Takes responsibility for own actions (R)	Responsibility Scale	.78
Callousness ($\alpha = 89$)	Origin	
Is critical of others	BASC—Aggression	.66
Tries to get away with things he/she knows are wrong	Responsibility Scale	.69
Denies wrongdoing even when confronted with evidence	Responsibility Scale	.80
This child does things that bother me just to be mean	Teacher Stress	.91
This student seems to have no guilt after misbehavior	Teacher Stress	.92
Empathy ($\alpha = 83$)	Origin	
When I'm mean to someone, I feel bad about it later	Empathic Attitudes Questionnaire	.60
I'm happy when my teacher says my friend did a good job	Empathic Attitudes Questionnaire	.81
I would get upset if I saw someone hurt an animal	Empathic Attitudes Questionnaire	.70
I understand how other kids feel	Empathic Attitudes Questionnaire	.57
I would feel bad if my mom's friend got sick	Empathic Attitudes Questionnaire	.66
Other people's problems really bother me	Empathic Attitudes Questionnaire	.65
I feel happy when my friend gets a good grade	Empathic Attitudes Questionnaire	.76
When I see a kid who is upset it really bothers me	Empathic Attitudes Questionnaire	.72
I would feel bad if a kid sitting next to me got in trouble	Empathic Attitudes Questionnaire	.55
It is easy for me to tell when my parent has a good day at work	Empathic Attitudes Questionnaire	.78
It bothers me when my teacher doesn't feel well	Empathic Attitudes Questionnaire	.57
I feel sorry for kids who can't find anyone to play with	Empathic Attitudes Questionnaire	.61
Seeing a kid who is crying makes me feel like crying	Empathic Attitudes Questionnaire	.66
If two kids are fighting, someone should stop it	Empathic Attitudes Questionnaire	.59
It would bother me if my friend got grounded	Empathic Attitudes Questionnaire	.54
When I see someone who is happy, I feel happy too	Empathic Attitudes Questionnaire	.53

R = reverse-coded

Table 2 Descriptive and internal consistency statistics for all study variables

Variable	Fall 2004				Spring 2005			
	N	*M*	*SD*	α	*N*	*M*	*SD*	α
Conduct problems	781	1.29	0.36	.75	861	1.38	0.46	.83
Uncaring	781	2.26	0.76	.91	861	2.32	0.78	.91
Callousness	783	1.74	0.85	.88	868	1.79	0.84	.89
Empathy	793	2.36	0.80	.81	851	2.22	0.45	.83
Student–teacher relationship	–	–	–	–	862	3.83	0.68	.82
Closeness	–	–	–	–	862	3.85	0.84	.79
Conflict	–	–	–	–	862	2.07	1.13	.94
Dependency	–	–	–	–	862	2.33	0.87	.77
Math exam	–	–	–	–	1210	589.67	74.36	–
Reading exam	–	–	–	–	1097	596.01	76.79	–

Table 3 Correlations for all study variables

Measure	1	2	3	4	5	6	7	8	9
1. Conduct problems		.438***	.326***	−.647***	−.298***	.683***	.259***	−.281***	−.336***
2. Callous-unemotional traits[a]			−.219***	−.477***	−.170***	.505***	.260***	−.109**	−.173***
3. Callous-unemotional traits[b]				−.417***	−.197***	.427***	.185***	−.109**	−.115**
4. Student–teacher relationship quality					.554***	−.904***	−.552***	.250***	.297***
5. Student–teacher closeness						−.266***	.195***	.106**	.164***
6. Student–teacher conflict							.486***	−.234***	−.262***
7. Student–teacher dependency								−.171***	−.169***
8. Math exam score									.933***
9. Reading exam score									

** $p < .01$; *** $p < .001$

[a] Callous-unemotional traits = high uncaring, high callous, low empathy; callous-unemotional traits

[b] Callous-unemotional traits = high uncaring, high callous, high empathy

Level 1
$$Y_{ij}\ (\text{Student–Teacher Closeness}) = \beta_{0j} + \beta_{1j}\ (\text{Gender}) + \beta_{2j}\ (\text{Race/Ethnicity}) + \beta_{3j}\ (\text{SES}) + \beta_{4j}\ (\text{CP}_{\text{BL}}) + \beta_{5j}\ (\text{CU1}_{\text{BL}}) + \beta_{6j}\ (\text{CU2}_{\text{BL}}) + \beta_{7j}\ (\text{CP}_{\text{FU}}) + \beta_{8j}\ (\text{CU1}_{\text{FU}}) + \beta_{9j}\ (\text{CU2}_{\text{FU}}) + r_{ij}$$

Level 2
$$\beta_{0j} = \gamma_{00} + \gamma_{01}\ (\text{Classroom Teacher}) + u_{0j}$$
$$\beta_{1j} = \gamma_{10}$$
$$\beta_{2j} = \gamma_{20}$$
$$\beta_{3j} = \gamma_{30}$$
$$\beta_{4j} = \gamma_{40}$$
$$\beta_{5j} = \gamma_{50}$$
$$\beta_{6j} = \gamma_{60}$$
$$\beta_{7j} = \gamma_{70}$$
$$\beta_{8j} = \gamma_{80}$$
$$\beta_{9j} = \gamma_{90}$$

Multilevel modeling techniques, including HLM, share the same, although modified, assumptions of many general linear models. Before running these models, the data were examined to ensure that the assumptions of linearity, normality, and homoscedasticity were met. In addition, we confirmed that observations were independent of each other by checking that the level-1 and level-2 residuals were uncorrelated, as were the errors.

Unconditional Models

For student–teacher relationship quality, 62 % of the variance was between students (ICC = .38). While a total score, reflecting an overall positive relationship (high closeness, lower conflict and dependency) has been used in previous research (see Pianta et al. 1995), the correlations among these subscales in the present study (ranging from $r = -.27$ to .49) suggest they have enough unique variance that they may be differentially related to focal outcomes in important ways. Therefore, unconditional models were also examined for each subscale. Fifty-eight percent of the variance in student–teacher closeness was between students (ICC = .42), 79 % of the variance in student–teacher conflict was between students (ICC = .21), and 51 % of the variance in student–teacher dependency was between students (ICC = .49). In the unconditional models examining variability in academic achievement, 59 % of the variance in achievement on the standardized math exam was between students (ICC = .41) and 64 % of the variance in achievement on the standardized reading exam was between students (ICC = .36).

Conditional Models

As shown in Table 5, a number of child demographic characteristics were significant in the final conditional models. Teachers reported poorer quality relationships with male students than female students. In particular, relationships with male students were less close, and more conflicted and dependent. Teachers reported poorer quality relationships with Black/African American and Hispanic/Latino students than with White/Non-Hispanic students. In particular, teachers rated these relationships as less close and more conflicted for Black/African American and Hispanic/Latino students. Finally, compared to children living above the poverty line, teachers reported that their relationships with children living at or below the poverty line were significantly more dependent. Regarding academic achievement, male students performed significantly worse on the standardized reading exam than females. Children living at or below the poverty line performed slightly worse on both standardized math and reading exams than children living above the poverty line. No differences by student

Table 4 Descriptive statistics of outcome variables by gender, race/ethnicity, and poverty status

	Gender		*t*	Race/ethnicity				*F*	Living in poverty		*t*
	Male *M* (*SD*)	Female *M* (*SD*)		White *M* (*SD*)	Hispanic *M* (*SD*)	Black *M* (*SD*)	Other *M* (*SD*)		No *M* (*SD*)	Yes *M* (*SD*)	
STRQ	3.63 (0.79)	4.02 (0.59)	−8.93***	4.21 (0.51)	3.87 (0.66)	3.67 (0.69)	4.17 (0.54)	18.00***	3.91 (0.66)	3.77 (0.68)	3.11**
Closeness	3.66 (0.86)	4.04 (0.78)	−6.83***	4.15 (0.66)	3.90 (0.80)	3.78 (0.89)	3.81 (0.85)	3.05*	3.88 (0.85)	3.83 (0.83)	0.73
Conflict	2.42 (1.74)	1.74 (0.93)	9.20***	1.54 (0.79)	1.99 (1.09)	2.37 (1.19)	1.45 (0.80)	20.46***	1.97 (1.08)	2.16 (1.17)	−2.45*
Dependency	2.34 (0.86)	2.32 (0.89)	−3.89***	2.05 (0.79)	2.38 (0.87)	2.41 (0.87)	1.88 (0.80)	9.66***	2.22 (0.86)	2.44 (0.88)	−3.74***
Math	608.66 (43.41)	612.33 (39.95)	0.28	629.21 (34.57)	608.78 (43.13)	606.81 (39.60)	630.28 (39.59)	11.42***	617.13 (40.20)	604.41 (42.15)	5.09***
Reading	614.06 (37.76)	625.62 (34.02)	−5.03***	644.46 (37.57)	618.64 (35.29)	616.19 (35.94)	638.28 (33.46)	14.92***	626.78 (34.69)	613.31 (36.68)	5.89***

STRQ student–teacher relationship quality

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

race/ethnicity in academic achievement were found after accounting for poverty status. The first model examined the effect of CP and both CU trait profiles on overall student–teacher relationship quality in the spring of 3rd grade, controlling for the covariates as well as CP and both CU trait profiles in the fall of 3rd grade. This model explained 67 % of the variance in spring student–teacher relationship quality, with CP and both CU trait profiles negatively related to student–teacher relationship quality. Children high in CP and CU traits, regardless of empathy level, had significantly poorer quality relationships with their teachers than children below the mean on the CU subscales.

For student–teacher closeness, this model explained 28 % of the variance, with CP and the first CU trait profile (i.e., high callousness and uncaring, low empathy) negatively related to closeness. Children high in CP, and above average in callousness and uncaring and below average in empathy had significantly less close relationships with teachers. Children who were above average in callousness, uncaring and also in empathy, however, were no less close to their teachers than children below the mean on the three CU subscales, suggesting that lack of empathy together with callousness and uncaring may significantly hinder student–teacher closeness.

For student–teacher conflict, this model explained 74 % of the variance in student–teacher conflict, with CP and both CU trait profiles significantly positively related to student–teacher conflict. Thus, this model demonstrated that regardless of empathy level, children high in CP, callousness, and uncaring had significantly more conflicted relationships with their teachers than children below the mean on the CU subscales.

For student–teacher dependency, 20 % of the variance was explained by the predictors in the model, with both CU trait profiles positively related to student–teacher dependency. Consistent with student–teacher conflict, children high in CU traits, regardless of empathy level, had significantly more dependent relationships with their teachers than children below the mean on the CU subscales. In this model, CP was not significantly related to student–teacher dependency.

The next set of models examined the effect of CP and both CU trait profiles on academic achievement. For achievement on the standardized math exam, 16 % of the variance in math scores and 12 % of the variance in reading scores was explained by the predictors in the models, with both CU trait profiles negatively related to math scores and reading scores. Children high in CU traits, regardless of empathy level, scored significantly lower on standardized math and reading exams than children below the mean on the CU subscales. Within these models, CP was not significant, suggesting that both CU trait profiles

Table 5 HLM estimates of conduct problems and callous-unemotional trait profiles predicting relational and academic outcomes in spring controlling for fall

Variable	Student–teacher relationship quality				Academic achievement	
	Overall *B* (*SE*)	Closeness *B* (*SE*)	Conflict *B* (*SE*)	Dependency *B* (*SE*)	Math *B* (*SE*)	Reading *B* (*SE*)
Intercept						
Gender	0.11 (0.02)***	0.21 (0.04)***	−0.16 (0.04)***	0.10 (0.04)*	−0.87 (2.29)	8.82 (2.03)***
Race/ethnicity						
Hispanic	−0.14 (0.05)**	−0.19 (0.09)*	0.17 (0.07)*	0.06 (0.11)	−5.67 (5.94)	−8.99 (5.56)
African American	−0.19 (0.05)***	−0.21 (0.09)*	0.25 (0.07)**	0.10 (0.12)	−6.75 (5.77)	−10.30 (5.84)
Other	−0.09 (0.06)	−0.30 (0.12)*	−0.05 (0.08)	−0.15 (0.14)	2.87 (5.40)	−5.78 (5.35)
Poverty status	−0.01 (0.03)	0.00 (0.05)	−0.04 (0.04)	0.10 (0.04)*	−6.27 (2.27)**	−7.61 (2.49)**
Covariates (fall)						
Conduct problems	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.01)	−0.01 (0.01)
Callous-unemotional Traits[a]	0.02 (0.04)	0.01 (0.06)	−0.09 (0.07)	−0.03 (0.07)	4.91 (3.12)	−4.21 (2.86)
Callous-unemotional traits[b]	0.03 (0.04)	−0.07 (0.07)	−0.16 (0.07)*	−0.05 (0.07)	−2.71 (3.91)	−0.82 (3.25)
Predictors (Spring)						
Conduct problems	−0.61 (0.05)***	−0.30 (0.07)***	1.20 (0.09)***	0.08 (0.05)	0.00 (0.02)	−0.01 (0.02)
Callous-unemotional traits[a]	−0.52 (0.04)***	−0.21 (0.07)**	0.98 (0.08)***	0.36 (0.09)***	−7.55 (3.88)*	−8.30 (3.32)*
Callous-unemotional traits[b]	−0.54 (0.05)***	−0.11 (0.07)	1.05 (0.09)***	0.39 (0.07)***	−9.00 (3.33)**	−10.05 (3.31)**

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

[a] Callous-unemotional traits = high uncaring, high callous, low empathy

[b] Callous-unemotional traits = high uncaring, high callous, high empathy

wiped out the associations between CP and both math and reading achievement.

Discussion

Previous research has demonstrated that children with behavior problems experience significant deficits across a wide range of domains. Given the relatively large proportion of youth who are identified as high in conduct problems, it has become increasingly important to consider the heterogeneous nature of this population of children (Moffitt 1993). Therefore, this study contributes to existing literature on youth behavior problems by highlighting the specific role that callous-unemotional traits play in the relationship between conduct problems and academic performance, given that early callous-unemotional traits have been associated with a range of maladaptive functioning across multiple domains (Frick et al. 2014). This contribution is especially noteworthy given that it is the first study to examine callous-unemotional traits specifically in relation to academic outcomes—while many studies focus on the impact of such characteristics on functioning within the home and in interpersonal relationships, as yet no published literature reflects on their impact on factors relevant to school success.

This is important given that prior research suggests that academic success in elementary school is important for optimizing youth development through adolescence and beyond in the academic context (e.g., Roorda et al. 2011), but also in other domains of functioning. Academic achievement is associated with delayed initiation of substance use (Atkins et al. 2002), while academic underachievement is associated with worse health outcomes (Muennig 2005), greater dependence on public assistance (Waldfogel et al. 2005), increased involvement in criminal behavior (Moretti 2005), school dropout, and serious behavior problems (Henry et al. 2012).

Similarly, positive student–teacher relationships are associated with a wide range of youth outcomes, including increased self-efficacy and prosocial behaviors (Chan et al. 2013), better emotional regulation, social skills, and self-perceptions (Rhodes and Lowe 2009), and decreased disciplinary problems (Crosnoe et al. 2004). In addition,

interactions between students and their teachers can influence the quality of students' experiences by instilling values such as motivation in the classroom and effective learning perspectives (Davis 2003). Furthermore, high quality student–teacher relationships have been found to be protective, buffering against individual and environmental risk factors that are often associated with maladaptive development. For example, Griggs et al. (2009) found that positive student–teacher relationships in elementary school moderate the relationship between temperament and disruptive peer play, while Wang et al. (2013) found that positive relationships between students and teachers moderated the effect of effortful control and parent-adolescent conflict at age 13 on emotional and behavioral adjustment at age 18. These findings highlight the importance of student–teacher relationships on developmental trajectories throughout childhood and adolescence. Taken together, this body of research supports Pianta's (1997) notion of "affordance value"—in their relationships with children, adults make resources available to the child that would not otherwise be available and that support development across a range of domains.

Given the importance of fostering academic success in elementary school, in this study we sought to examine the effects of profiles of callous-unemotional traits, over and above the effects of conduct problems, on student–teacher relationship quality and academic achievement for a cohort of 3rd grade children in order to identify specific avenues for intervention. Exploratory factor analysis was used to identify factors underlying a set of items drawn from a number of measures that mapped onto two factors of the ICU—Uncaring and Callousness (Frick 2004). To ensure that we were capturing the construct of callous-unemotional traits as accurately as possible, including the component of Empathy, we also included items from the child-reported Empathic Attitudes Questionnaire. Hierarchical linear modeling enabled us to test our hypotheses that children exhibiting both conduct problems and callous-unemotional traits would be reported as having worse relationships with their teachers—relationships that were less close and more dependent and conflicted—than children without such characteristics and that they would perform worse on standardized exams. Furthermore, we investigated the role of empathy in these relationships to determine whether each child's own perspective of their empathic attitudes altered these relationships between conduct problem and callous-unemotional trait profiles and the academic outcomes of interest.

Consistent with previous studies (e.g., Arnold 1997; Holmes et al. 2001; Moffitt 1993), our results suggest that conduct problems are significantly related to psychosocial and behavioral outcomes in the academic domain. Bivariate analyses indicated that children who were reported by their teachers as being higher in conduct problems had lower overall quality student–teacher relationships and performed worse on standardized math and reading exams at the end of 3rd grade.

Regarding student–teacher relationships, callous-unemotional traits did have an effect over and above conduct problems. For overall student–teacher relationship quality, teachers who rated their students high in callousness and uncaring, regardless of empathy level, reported significantly poorer quality relationships with their students than teachers who rate their children low in both conduct problems and callous-unemotional traits. Findings for the relationship quality subscales, however, were somewhat less consistent. While children exhibiting high levels of conduct problems were reported as being more distant from their teachers than those with low levels, presence of high levels of callous-unemotional traits only had an additional influence when coupled with low empathy. Children high in both conduct problems and callous-unemotional traits demonstrated more conflicted relationships with their teachers, regardless of empathy level and were more dependent on their teachers than children low in callous-unemotional traits, regardless of whether they were high or low in conduct problems or empathy.

Taken together, our hypothesis that children high in conduct problems and callous-unemotional traits would have poorer quality relationships with their teachers was confirmed. In general, these children tend to be seen by their teachers as more distant, conflicted, and dependent on their teachers than children low in both conduct problems and callous-unemotional traits. Furthermore, results suggest that child-reported empathy does not play a significant role in differentiating whether callous-unemotional traits affect student–teacher relationship quality, aside from perhaps in student–teacher closeness, where children low in empathy were found to be less close to their teachers than children high in empathy when considered in combination with both conduct problems and the uncaring and callousness factors. This finding may have important implications both methodologically, as it is the only variable in the study measured via self-report, and in the practical design of intervention techniques for at-risk youth. Youth with both conduct problems and callous-unemotional characteristics who are low in empathy may benefit from evidence-based programs that have been shown to increase empathy, prosocial behaviors, and social-emotional competence, such as Roots of Empathy (Gordon 2005), as empathy development may prove fundamental for enabling these students' to develop and sustain high quality relationships with their teachers.

The inclusion of callous-unemotional traits in these models accounted for a large enough proportion of the variance in scores on the standardized math and reading

exams, that the relationship between conduct problems and academic achievement was mitigated. As hypothesized, higher CU traits, regardless of empathy level were significantly associated with lower math and reading achievement.

Findings from this study have important implications for intervention with youth with different profiles of behavior problems. They suggest that callous-unemotional traits play a large enough role in academic outcomes to warrant early screening for youth demonstrating behavior problems in elementary school. Screening for high levels of callousness, unemotionality, and empathy can identify youth who may have a harder time engaging prosocially with teachers and peers and may perform worse on tests of academic achievement. These youth may benefit from different types of interventions than children who experience conduct problems without the co-occurring social-emotional deficits that are characteristic of youth with callous-unemotional traits. A number of social-emotional learning (SEL) interventions have been successful in reducing behavior problems among at-risk youth, such as Fast Track (Bierman 2002) and the 4Rs program (Jones et al. 2011); however, for youth with callous-unemotional traits, programs that include a cognitive component to the intervention may be necessary in order to evoke change that extends to improvements in academic outcomes.

Conclusions from these findings, however, should be considered in light of some methodological limitations. Given that almost half of the teacher-report items used to conceptualize callous-unemotional traits, in particular the Uncaring factor, came from the Social Competence Scale (CPPRG 1999), it is possible these items are failing to truly assess callous-unemotional traits, rather than just the *absence* of social competence, which may be a larger issue with the construct of callous-unemotional traits more generally. Indeed, uncaring and callousness, regardless of empathy, were related to outcomes in ways that would also be hypothesized for social competence (or lack thereof); however, the relationship between callous-unemotional traits and social competence remains somewhat unclear. In addition, the reliance on a teacher-report measure to identify student–teacher relationship quality, conduct problems, uncaring, and callousness characteristics may have resulted in at least partially biased representations of these relationships, as studies have found that teacher reports and child reports have low concordance rates, particularly in regard to student–teacher relationships (Murray et al. 2008). Given that previous research suggests that teachers typically rate the same students negatively across numerous psychosocial constructs (Stanger and Lewis 1993), it is possible these teacher ratings of conduct problems, callous-unemotional traits, and student–teacher relationship quality do not reflect truly distinct constructs, but instead reflect a single, negative reputation or perception that is being divided into somewhat less robust factors. This is perhaps underscored by the significant correlation between student–teacher relationship quality and scores on the standardized achievement exams (see Table 3). For this reason, additional research is needed that utilizes multiple reporters, such as children who self-report and parents, to assess these psychosocial constructs.

Although the use of a child-report measure to capture youth empathic attitudes enabled us to consider viewpoints from multiple reporters, the findings regarding empathy must be interpreted cautiously, given that prior research has shown that displaying empathy is contextually driven. Therefore, while children were able to provide self-reports of their own empathic attitudes across multiple contexts, teachers were asked to rate children in relation to just one single context (the school setting).

Similarly, regarding all of the measures, the lack of consistency of timeframes that the respondents were asked to consider in their responses may have directly affected the temporal stability of the traits being measured. While some of the measures used to assess conduct problems and callous-unemotional traits specified consideration of behaviors over the past 30 days (e.g., BASC-CP, Social Competence Scale), other measures did not specify a timeframe (e.g., Children's Empathic Attitudes Questionnaire, Index of Teaching Stress). The temporal imprecision associated with this lack of consistency across items on behavioral timeframes may have substantially weakened our ability to detect expected effects. In addition, given the cross-sectional nature of this study, the direction of effects cannot be determined.

Finally, our analyses examining scores on standardized math and reading exams should be interpreted with caution, given that academic achievement in 3rd grade is actually a cumulative measure of achievement from kindergarten through the current assessment period. It is therefore unclear how earlier achievement may have influenced both student–teacher relationships and teacher ratings of youth emotional and behavioral problems. Without a baseline measure of academic achievement, the temporality of these relationships remains unclear.

Replication of the current study design with different age groups may be able to provide valuable information on the development and progression of negative effects of conduct problems with and without co-occurring callous-unemotional traits on interpersonal and academic variables. Given that callous-unemotional traits have been identified in children as young as pre-school, longitudinal research that follows children from their entry into formal schooling and beyond may be especially valuable in not only intervention efforts, but also preventive efforts. By being able to differentiate subgroups of children exhibiting conduct problems based on presence or absence of callous-

unemotional traits, it may be possible to identify different forms of intervention for children displaying different patterns of symptomatology. This finding has important policy implications as the field of developmental science attempts to design and enrich programs that focus on improving social-emotional learning.

Conclusions

The present study is one of the first to examine the relationship between callous-unemotional traits and academic outcomes, over and above conduct problems. By examining profiles of children exhibiting conduct problems with and without callous-unemotional traits, we were able to consider the differential impacts that these characteristics may have on student–teacher relationship quality and on standardized tests of academic achievement. The results provide valuable information on the role of callous-unemotional traits in children's functioning in the classroom setting within one school year in a diverse population of urban elementary school students. Children with higher than average levels of callous-unemotional traits tend to have worse relationships with their teachers and lower academic achievement, over and above the impact of just conduct problems, on these outcomes. These findings contribute to the literature on callous-unemotional traits, which have been found to be associated with a host of maladaptive developmental outcomes across multiple domains of functioning (Frick and White 2008). In addition, they highlight the need to consider different forms of intervention for children with behavior problems who demonstrate varying co-occurring emotional and interpersonal problems. Early identification of callous-unemotional traits may allow school personnel to intervene in a timely manner to alter maladaptive academic and behavioral trajectories for at-risk youth.

Authors' Contributions JLB, SMJ, and JLA collected the data used in this study as part of a larger, prospective, longitudinal study examining the effectiveness of a school-based social-emotional learning and literacy program that followed one cohort of children from elementary school through high school. Under the mentorship of JLB, JMH conceived of this specific study that uses these data. JMH conducted the literature review, ran the study analyses, and drafted the manuscript. JLB, SMH, and JLA extensively revised the manuscript critically for important intellectual content and provided feedback on analytic revisions. All authors read and approved the final manuscript.

Conflicts of interest The authors report no conflicts of interest.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Publication.

Anastassiou-Hadjicharalambous, X., & Warden, D. (2008). Physiologically-indexed and self-perceived affective empathy in conduct-disordered children high and low on callous-unemotional traits. *Child Psychiatry and Human Development, 39*(4), 503–517.

Arnold, D. (1997). Co-occurrence of externalizing behavior problems and emergent academic difficulties in young high-risk boys: A preliminary evaluation of patterns and mechanisms. *Journal of Applied Developmental Psychology, 18*, 317–330.

Arnold, D., Brown, S., Meagher, S., Baker, C., Dobbs, J., & Doctoroff, G. (2006). Preschool-based programs for externalizing problems. *Education and Treatment of Children, 29*(2), 311–339.

Atkins, L. A., Oman, R. F., Vesely, S. K., Aspy, C. B., & McLeroy, K. (2002). Adolescent tobacco use: The protective effects of developmental assets. *American Journal of Health Promotion, 16*(4), 198–205.

Bassarath, L. (2001). Conduct disorder: A biopsychosocial review. *Canadian Journal of Psychiatry, 46*(7), 609–616.

Bierman, K. (2002). Evaluation of the first 3 years of the Fast Track prevention trial with children at high risk for adolescent conduct problems. *Journal of Abnormal Child Psychology, 30*(1), 19–35.

Bohart, A., & Stipek, D. (2001). Pathways to constructive lives: The importance of early school success. In A. Bohart & D. Stipek (Eds.), *Constructive and destructive behavior: Implications for family, school, and society* (pp. 291–315). Washington D.C.: American Psychological Association.

Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications, Inc.

Bub, K., McCartney, K., & Willet, J. (2007). Behavior problem trajectories and first-grade cognitive ability and achievement skills: A latent growth curve analysis. *Journal of Educational Psychology, 99*(3), 653–670.

Chan, C. S., Rhodes, J. E., Howard, W. J., Lowe, S. R., Schwartz, S. E., & Herrera, C. (2013). Pathways of influence in school-based mentoring: The mediating role of parent and teacher relationships. *Journal of School Psychology, 51*(1), 129–142.

Christian, R., Frick, P., Hill, N., & Tyler, L. (1997). Psychopathy and conduct problems in children: II. Implications for subtyping children with conduct problems. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*(2), 233–241.

Conduct Problems Prevention Research Group (CPPRG). (1999). Initial impact of the fast track prevention trial for conduct problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology, 67*(5), 648–657.

Crosnoe, R., Johnson, M. K., & Elder, G. H. (2004). Intergenerational bonding in school: The behavioral and contextual correlates of student–teacher relationships. *Sociology of Education, 77*(1), 60–81.

Dadds, M. R., Fraser, J., Frost, A., & Hawes, D. (2005). Disentangling conduct problems and early psychopathic traits in children: A longitudinal community study. *Journal of Consulting and Clinical Psychology, 73*, 400–410.

Davis, H. A. (2003). Conceptualizing the role and influence of student–teacher relationships on children's social and cognitive development. *Educational Psychologist, 38*(4), 207–234.

Elias, M., & Haynes, N. (2008). Social competence, social support, and academic achievement in minority, low-income, urban elementary school children. *School Psychology Quarterly, 23*(4), 474–495.

Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment, 13*(4), 454–469.

Frick, P. J. (2004). *The inventory of callous-unemotional traits*. The University of New Orleans: Unpublished Rating Scale.

Frick, P. J., & Dickens, C. (2006). Current perspectives on conduct disorder. *Current Psychiatry Reports, 8*, 59–72.

Frick, P. J., & Ellis, M. (1999). Callous-unemotional traits and subtypes of conduct disorder. *Clinical Child and Family Psychology Review, 2*(3), 149–168.

Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Annual research review: A developmental psychopathology approach to understanding callous-unemotional traits in children and adolescents with serious conduct problems. *Journal of Child Psychology and Psychiatry, 55*(6), 532–548.

Frick, P. J., & White, S. (2008). Research review: The importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *The Journal of Child Psychology and Psychiatry, 49*(4), 359–375.

Funk, J., Fox, C., Chan, M., & Curtiss, K. (2008). The development of the Children's Empathic Attitudes Questionnaire using classical and Rasch analyses. *Journal of Applied Developmental Psychology, 29*(3), 187–196.

Gordon, M. (2005). *Roots of empathy: Changing the world child by child*. Toronto, ON: Thomas Allen.

Green, R. W., Abidin, R. R., & Kmetz, C. (1997). The index of teaching stress: A measure of student–teacher compatibility. *Journal of School Psychology, 35*(3), 239–259.

Griggs, M. S., Gagnon, S. G., Huelsman, T. J., Kidder-Ashley, P., & Ballard, M. (2009). Student–teacher relationships matter: Moderating influences between temperament and preschool social competence. *Psychology in the Schools, 46*(6), 553–567.

Hamre, B., Pianta, R., Downer, J., & Mashburn, A. (2008). Teachers' perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development, 17*(1), 115–136.

Henry, K. L., Knight, K. E., & Thornberry, T. P. (2012). School disengagement as a predictor of dropout, delinquency, and problem substance use during adolescence and early adulthood. *Journal of Youth and Adolescence, 41*(2), 156–166.

Hill, J. (2002). Biological, psychological and social processes in the conduct disorders. *Journal of Child Psychology and Psychiatry, 43*(1), 133–164.

Holmes, S. E., Slaughter, J. R., & Kashani, J. (2001). Risk factors in childhood that lead to the development of conduct disorder and antisocial personality disorder. *Child Psychiatry and Human Development, 31*(3), 183–193.

Hughes, J., Cavell, T., & Jackson, T. (1999). Influence of the teacher–student relationship on childhood conduct problems: A prospective study. *Journal of Clinical Child Psychology, 28*(2), 173–184.

Institute of Education Sciences/Center for Disease Control (IES/CDC). (2003). *The responsibility scale*. Unpublished Rating Scale.

Jones, S. M., Brown, J. L., & Aber, J. L. (2011). Two-year impacts of a universal school-based social-emotional literacy intervention: An experiment in translational developmental research. *Child Development, 82*(2), 533–554.

Kamphaus, R. W., & Reynolds, C. R. (1998). *Behavior assessment system for children*. Circle Pines, MN: American Guidance Service.

Kimonis, E., Frick, P., & Barry, C. (2004). Callous-unemotional traits and delinquent peer affiliation. *Journal of Consulting and Clinical Psychology, 72*(6), 956–966.

Kimonis, E., Frick, P., Boris, N., Smyke, A., Cornell, A., Farrell, J., & Zeanah, C. (2006). Callous-unemotional features, behavioral inhibition, and parenting: Independent predictors of aggression in a high-risk preschool sample. *Journal of Child and Family Studies, 15*, 745–756.

Larsson, H., Viding, E., & Plomin, R. (2008). Callous-unemotional traits and antisocial behavior: Genetic, environmental, and early parenting characteristics. *Criminal Justice and Behavior, 35*(2), 197–211.

Loeber, R., & Dishion, T. J. (1983). Early predictors of male delinquency: A review. *Psychological Bulletin, 94*, 325–382.

Lynam, D. (1997). Pursuing the psychopath: Capturing the fledgling psychopath in a nomological net. *Journal of Abnormal Psychology, 106*(3), 425–438.

MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods, 7*(1), 19–40.

Mertler, C. A., & Vannatta, R. A. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4th ed.). Los Angeles: Pyrczak.

Moffitt, T. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674–701.

Moretti, E. (2005). Does education reduce participation in criminal activities? In H. M. Levin (Ed.), *Symposium on the social costs of inadequate education conducted at teachers college*. New York: Columbia University.

Muennig, P. (2005). Health returns to education interventions. In H. M. Levin (Ed.), *Symposium on the social costs of inadequate education conducted at teachers college*. New York: Columbia University.

Murray, C., Murray, K., & Waas, G. (2008). Child and teacher reports of teacher–student relationships: Concordance of perspectives and associations with school adjustment in urban kindergarten classrooms. *Journal of Applied Developmental Psychology, 29*, 49–61.

Myers, S., & Pianta, R. (2008). Developmental commentary: Individual and contextual influences on student-teacher relationships and children's early problem behaviors. *Journal of Clinical Child and Adolescent Psychology, 37*(3), 600–608.

Obradovic, J., Pardini, D., Long, J., & Loeber, R. (2007). Measuring interpersonal callousness in boys from childhood to adolescence: An examination of longitudinal invariance and temporal stability. *Journal of Clinical Child and Adolescent Psychology, 36*(3), 276–292.

Orpinas, P., & Frankowski, R. (2001). The Aggression Scale: A self-report measure of aggressive behavior for young adolescents. *Journal of Early Adolescence, 21*, 50–67.

Pianta, R. C. (1997). Adult–child relationship processes and early schooling. *Early Education and Development, 8*(1), 11–26.

Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington D.C.: American Psychological Association.

Pianta, R. C. (2001). *Student–Teacher Relationship Scale*. Odessa, FL: PAR Inc.

Pianta, R. C., Steinberg, M. S., & Rollins, K. B. (1995). The first two years of school: Teacher–child relationships and deflections in children's classroom adjustment. *Development and Psychopathology, 7*, 295–312.

Reinke, W., Herman, K., Petras, H., & Ialongo, N. (2008). Empirically derived subtypes of child academic and behavior problems: Co-occurrence and distal outcomes. *Journal of Abnormal Child Psychology, 36*, 759–770.

Rhodes, J. E., & Lowe, S. R. (2009). Mentoring in adolescence. In *Handbook of Adolescent Psychology*, Vol. 2.

Roorda, D. L., Koomen, H. M., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher–student relationships on students' school engagement and achievement a meta-analytic approach. *Review of Educational Research, 81*(4), 493–529.

Sakai, J. T., Dalwani, M. S., Gelhorn, H. L., Mikulich-Gilbertson, S. K., & Crowley, T. J. (2012). A behavioral test of accepting benefits that cost others: Associations with conduct problems and unemotionality. *PLoS One, 7*, 1–12.

Solomon, D., Battistich, V., Watson, M., Schaps, E., & Lewis, C. (2000). A six-district study of educational change: Direct and

mediating effects of the Child Development Project. *Social Psychology of Education, 4*, 3–51.
Split, J., & Koomen, H. (2009). Widening the view on student–teacher relationships: Teachers' narratives concerning disruptive versus nondisruptive children. *School Psychology Review, 38*(1), 86–101.
Stanger, C., & Lewis, M. (1993). Agreement among parents, teachers, and children on internalizing and externalizing behavior problems. *Journal of Clinical Child Psychology, 22*, 107–115. doi:10.1207/s15374424jccp2201_11.
Waldfogel, J., Garfinkel, I., & Kelly, B. (2005). Public assistance programs: How much could be saved with improved education? In H. M. Levin (Ed.), *Symposium on the social costs of inadequate education conducted at teachers college*. New York: Columbia University.
Wang, M. T., Brinkworth, M., & Eccles, J. (2013). Moderating effects of teacher–student relationship in adolescent trajectories of emotional and behavioral adjustment. *Developmental Psychology, 49*(4), 690–705.
Waschbusch, D., & Willoughby, M. (2008). Attention-deficit/hyperactivity disorder and callous-unemotional traits as moderators of conduct problems when examining impairment and aggression in elementary school children. *Aggressive Behavior, 34*, 139–153.
Wootton, J., Frick, P., Shelton, K., & Silverthorn, P. (1997). Ineffective parenting and childhood conduct problems: The moderating role of callous-unemotional traits. *Journal of Consulting and Clinical Psychology, 65*(2), 301–308.

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