

# Callous-Unemotional Traits are Uniquely Associated with Poorer Peer Functioning in School-Aged Children

Sarah M. Haas<sup>1,2</sup> · Stephen P. Becker<sup>1,3</sup> · Jeffery N. Epstein<sup>1,3</sup> · Paul J. Frick<sup>4,5</sup>

© Springer Science+Business Media, LLC 2017

**Abstract** This study examines externalizing symptoms (attention-deficit/hyperactivity disorder [ADHD], conduct problems, and callous-unemotional [CU] traits) in relation to domains of peer functioning (social competence, loneliness, and close friendship quality), with a specific focus on the role of CU traits. One hundred twenty-four elementary students (grades 3–6; 45% boys) completed multiple measures of peer functioning, and teachers completed measures of externalizing symptoms and social competence. After controlling for demographic variables and other externalizing symptoms, CU traits were significantly associated with poorer peer functioning across all variables except for demands of exclusivity in close friendships. ADHD symptoms were also uniquely associated with poorer social functioning across a number of variables. In contrast, conduct problems were at times associated with better social functioning after controlling for the effects of other externalizing problems. These findings bolster the importance of developing and evaluating social skills interventions for children displaying elevated CU traits.

**Keywords** Callous-unemotional traits · Externalizing · Friendship · Peer acceptance · Loneliness

## Introduction

The association between externalizing symptoms and poor peer functioning is well documented, as impulsive or aggressive behaviors often identify children at-risk for poor social development (Hoza 2006; Newcomb et al. 1993). Consequently, children with symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD) as well as symptoms of conduct problems (i.e., Oppositional Defiant Disorder [ODD] and Conduct Disorder [CD]) are at-risk for poor social adjustment (Becker et al. 2012; Gardner and Gerdes 2015; Webster-Stratton and Lindsay 1999).

More recently, callous-unemotional (CU) traits have been identified as an important construct for understanding childhood externalizing symptoms (Frick et al. 2014). Also known as Limited Prosocial Emotions in the Fifth Edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association [APA] 2013), CU traits refer to affective deficits such as callousness or lack of empathy for others, not feeling guilty or remorseful for misbehavior, being unconcerned about performance, and shallow or deficient affect. Since CU traits characterize affective deficits associated with severe antisocial behaviors (Frick et al. 2014), it is not surprising that decades of research demonstrate CU traits to be related to, yet independent from, symptoms of ADHD and conduct problems (Pardini et al. 2006). Moreover, CU traits are uniquely associated with a range of functional impairments (see Frick et al. 2014 for a review).

In considering social functioning specifically, CU traits are characterized by “a cold insensitivity to the feelings and needs of others” (Lahey 2014, p. 4). Similar to ADHD and conduct

---

✉ Sarah M. Haas  
smhaas@buffalo.edu

<sup>1</sup> Division of Behavioral Medicine and Clinical Psychology, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, USA

<sup>2</sup> Department of Psychiatry, Penn State Hershey Medical Center, 22B Northeast Drive, Hershey, PA 17033, USA

<sup>3</sup> Department of Pediatrics, University of Cincinnati College of Medicine, Cincinnati, OH, USA

<sup>4</sup> Department of Clinical Psychology, Louisiana State University, Baton Rouge, LA, USA

<sup>5</sup> Learning Sciences Institute of Australia, Australian Catholic University, Melbourne, VIC, Australia

problems, social functioning impairments have been identified as an area of great relevance to childhood CU traits, so much so that social skills interventions have been considered a particularly valuable area for intervention among youth with CU traits (Barry et al. 2008). Despite the growing attention devoted to understanding the nature and treatment implications of CU traits, it is largely unknown whether CU traits contribute incrementally to social functioning impairments above and beyond other externalizing behaviors, such as ADHD and conduct problem symptoms.

### Unique Contribution of CU Traits to Peer Functioning

It is clear that ADHD and conduct problems are each uniquely associated with a broad range of social functioning impairments, including low social competence, poor social skills, peer rejection, and friendship difficulties (Becker et al. 2012; Gardner and Gerdes 2015; Webster-Stratton and Lindsay 1999). The hyperactive and impulsive features of ADHD and the angry, aggressive, and hostile features of conduct problems are considered central to the difficulties in developing appropriate peer relationships (Greene et al. 1996; Pardini and Fite 2010). Importantly, although ADHD and conduct problem symptoms are related to a number of similar impairments in social functioning, each independently predicts peer relationship status (Pardini and Fite 2010; Waschbusch 2002) and thus both are important for understanding the impact of externalizing behaviors on children's social functioning.

In contrast to ADHD and conduct problem symptoms, it is less clear if CU traits are uniquely associated with social functioning with peers (Pardini and Fite 2010). It is possible that the affective deficits associated with CU traits—including a lack of empathy and a callous disregard for others' feelings—do uniquely contribute to difficulties in developing appropriate peer relationships (Blair et al. 2001; Frick and Dantagnan 2005). This possibility is in line with a recent meta-analysis suggesting that ADHD is associated with deficits early into the perception of emotional cues (e.g., encoding) whereas CU traits may play a role in the response to emotional cues (e.g., empathy; Graziano and Garcia 2016).

Still, empirical evidence supporting the possibility that CU traits are uniquely associated with social functioning impairments is mixed (Haas et al. 2011; Piatigorsky and Hinshaw 2004). Some studies indicate that CU traits are associated with poor social support and negatively influence peer functioning beyond impulsive and aggressive behaviors for both non-referred and clinic-referred children (Andrade et al. 2015; Waschbusch and Willoughby 2008). For example, Piatigorsky and Hinshaw (2004) found CU traits to be associated with peer dislike beyond that of ADHD and conduct problems in a mixed sample of children with and without ADHD/conduct problems. Other studies do not support this relation and instead show that ADHD and/or conduct problems are associated with social

functioning impairments, thus suggesting that CU traits add little additional predictive value. For example, Haas et al. (2011) found that conduct problems, but not CU traits, were associated with peer dislike nominations in a sample of children with comorbid ADHD/conduct problems. Similarly, in a longitudinal study of non-referred youth, Pardini and Fite (2010) found that CU traits did not uniquely predict general social problems beyond ADHD and conduct problems. Nevertheless, these authors acknowledged their use of a broad measure of social problems and hypothesized that CU traits may be associated with poorer social functioning when using more fine-grained measures (Pardini and Fite 2010). Thus, an important extension of extant research is to examine CU traits in relation to impairments in specific aspects of social functioning such as teacher- and self-rated social competence, loneliness, and qualities of close friendships. Furthermore, these three areas of social functioning have important treatment implications for children with disruptive behavior difficulties, particularly in terms of understanding motivation for change (Hoza et al. 2004; Hoza et al. 1993; Weiner 1985).

**Social Competence** Social competence refers to individual attributes that are considered to underlie success in social situations (Harter 2012). With specific regard to social competence, CU traits have been associated with lower perceived social competence in non-referred (teacher-rated; Barry et al. 2008) and clinical (self-rated; Haas et al. 2015) samples of children. In fact, the association between higher CU traits and poorer self-perceptions of social competence aligns with the finding that higher CU traits are associated with other-raters' perceptions of peer dislike, suggesting that CU traits may be associated with accurate perceptions of social difficulties (Haas et al. 2015).

Although few studies have examined the relationship between CU traits and self-perceptions of social skills or social behavior, results from the broader literature on CU traits and social functioning suggest that CU traits are associated with relatively accurate perceptions of another's intention of a behavior (CU traits were not associated with a hostile attribution bias; Frick et al. 2003) and the consequences of one's own aggressive actions on others (Pardini 2011), appropriate social problem solving skills (Waschbusch et al., 2007b), and awareness of poor social abilities (Frick and Dantagnan 2005; Haas et al. 2015). These findings imply that instead of misperceptions underlying their use of antisocial behaviors, children with CU traits engage in antisocial behaviors because they lack the appropriate prosocial emotions, like empathy and caring for other people (Frick and Morris 2004) and thus do not care about the negative consequences their antisocial behavior have on other people (Pardini 2011).

Although ADHD symptoms are also associated with poorer self-perceptions of social competence, this association is much less pronounced in self-ratings as compared to parent

or teacher ratings (Scholtens et al. 2012; Swanson et al. 2012). Conversely, conduct problems are associated with the tendency to overestimate one's social functioning in clinical (Hughes et al. 1997; Webster-Stratton and Lindsay 1999) and community (Rodkin et al. 2000) samples. Thus, CU traits may be most clearly associated with the poorest perceived social competence across raters. However, given the limited amount of data that has examined self-perceptions and perceptions of others, it is too early to conclude that CU traits are uniquely associated with poorer perceived social competence or whether this association holds with other-ratings of their social adjustment. Examining teacher- and self-perceptions of social competence, particularly while also examining other aspects of social functioning, may provide clues as to if social interventions need to address the child's perception of social competence (if only self-perception is rated poorly) or social skills more broadly (if multiple informants suggest poor social functioning; Harter 2012).

**Loneliness** Loneliness is defined in terms of both: (a) an awareness of poor social functioning, and (b) a distressing feeling or other negative reaction to this perception (Asher and Paquette 2003; Houghton et al. 2015). Thus, although chronic peer rejection predicts loneliness in school due to reducing "children's sense of social self-acceptance" (Ladd and Troop-Gordon 2003; p. 1361), this definition of loneliness suggests that there may be a subset of children who exhibit poor social functioning but do not necessarily feel lonely as a result, particularly if are not distressed by their poor social functioning. Interestingly, the amount of distress that results from one's own behavior is considered to be a distinguishing factor between CU traits and other externalizing symptoms in that CU traits are associated with a lack of distress (Frick and Morris 2004). Given that CU traits are characterized by not caring about either one's performance or the impact one's misbehavior has on others (Frick et al. 2014), and given that CU traits are associated with having "little desire to develop meaningful relationships with others" (Pardini 2011, p. 253), it may be that CU traits are not positively related to subjective feelings of loneliness. That is, children with CU traits may not feel lonely even in the face of problematic peer relationships simply because they do not care about their poor performance or they do not care about having or making friends, which lowers their subjective feeling of distress about their poor social competence. However, no study to our knowledge has ever directly examined the association between CU traits and children's sense of loneliness.

Conversely, conduct problems are positively related to children's feelings of loneliness (Boivin et al. 1994). Given that loneliness predicts negative long-term outcomes (e.g., depression) beyond that of peer rejection (Qualter et al. 2010), it is important to better understand what association, if any, CU traits have with children's experiences of loneliness beyond that of conduct problems. Furthermore, since some degree of

distress may be important for making treatment gains (Hoza et al. 2004), a lack of an association between CU traits and loneliness may indicate that CU traits are related to an insufficient level of motivation for change.

**Close Friendship Quality** Dyadic friendships refer to the relationship between a child and their perceived close friend and can be characterized in terms of positive (e.g., intimacy) and negative (e.g., jealousy) qualities (Grottpeter and Crick 1996). Quality of dyadic peer relationships is separable from overall peer status (e.g., popularity; Asher et al. 1996; Bukowski and Hoza 1989). Although previous research shows that CU traits designate a subgroup of children who are broadly rejected by their typically-developing peers (Frick and Dantagnan 2005), CU traits have yet to be examined in relation to friendship *quality*. This is an important limitation in the current literature given that friendship quality may in fact be a more important predictor of social development and later adjustment than overall peer functioning (Becker et al. 2013; Furman and Robbins 1985; Parker and Asher 1993) and given that CU traits may also be associated with appropriate short-term relationships and/or reciprocated relationships with deviant peers (Munoz et al. 2008). This is bolstered as a notable limitation of research on childhood CU traits by one conclusion from a recent exhaustive literature review that states: "very little work has focused on... the quality of their [youths with CU traits] peer relationships" (Frick et al. 2014, p. 27).

Two qualities of close friendships may be specifically important within the context of CU traits in children - intimate exchange and exclusivity. Intimate exchange refers to the degree to which children feel they can share personal information with a close friend (e.g., secrets, what makes them feel sad; Grottpeter and Crick 1996). It is plausible that CU traits are either unrelated or positively related to intimate exchange given that children with CU traits are considered to be able to engage in short-term peer relationships "in which they essentially use people for their own purposes" (Munoz et al. 2008; p. 213). Thus, it may be that getting others to divulge intimate information is one method used by children with CU traits for the purpose of using others for their own personal gain, particularly since youth with CU traits tend to form friendships with peers who have low self-esteem (Van Zalk and Van Zalk 2015). If so, this may be an important difference from other externalizing symptoms since ADHD and conduct problems have been associated with low levels of intimate exchange in dyadic friendships (Grottpeter and Crick 1996).

Within the context of close friendships, exclusivity refers to the degree to which there is a desire to play exclusively with a close friend or to feel jealousy when the close friend is not playing exclusively with them (Grottpeter and Crick 1996). Previous research demonstrates that ADHD is positively related to demands for exclusivity (Normand et al. 2011). In addition,

given that previous research shows self-reported jealousy within dyadic relationships to be less associated with overt forms of aggression (Parker et al. 2005), conduct problems are likely unrelated or perhaps negatively related to demands for exclusivity. In contrast, given the specific relationship between CU traits and reduced responsiveness to negative events (e.g., negative emotions in others, threat, punishment; Blair et al. 2001; Pardini 2006), it may be that CU traits are also related to reduced responsiveness to negative social events that occur within the context of interacting with their peers. Thus, children with CU traits may not get jealous or care if their friends associate with other friends, resulting in a non-significant relationship between CU traits and demands for exclusive peer relationships. However, the possibility has not been empirically examined. However, this may be a particularly helpful point of intervention to mitigate the long-term social difficulties that children with CU traits experience. That is, if CU traits are associated with specific qualities indicative of poor dyadic relationships, this may be an important first point of intervention (Becker et al. 2013).

Friendship satisfaction is considered to be a broad domain that is a related yet separate construct associated with the culmination of perceived positive and negative friendship qualities, including intimate exchange and exclusivity (Grotperter and Crick 1996; Parker and Asher 1993). Typically, close friendship satisfaction is considered to be higher when there are more perceived positive qualities of the friendship than perceived negative qualities (Ladd 1999). Previous research shows that symptoms of ADHD and conduct problems are associated with less satisfaction in their close friendships (e.g., Normand et al. 2011), although another study suggests no difference between aggressive and nonaggressive boys in terms of perceived friendship satisfaction, perhaps due to an inflated positive perception of the friendship (e.g., positive illusory bias; Bagwell and Coie 2004). Because individuals with CU traits are described as being able to adapt socially within the context of short-term relationships, but who are also perceived as being more socially deviant in longer-term relationships (Babiak and Hare 2006; Munoz et al. 2008), such traits may be unrelated to a broad assessment of friendship satisfaction. If true, this represents another divergent relationship between CU traits and other externalizing symptoms and social functioning.

## The Present Study

In the current study, we examine whether CU traits are uniquely related to specific domains of children's peer functioning after controlling for other externalizing symptoms (i.e., ADHD and conduct problem symptoms). The aspects of social functioning that are measured in the current study include: (a) teacher- and self-rated social competence, (b) feelings of loneliness, and (c) close friendship quality (i.e., intimate

exchange, demand for exclusivity, overall friendship satisfaction). After accounting for symptoms of ADHD and conduct problems, it was hypothesized that:

1. CU traits would be negatively related to social competence across raters;
2. CU traits would be unrelated to subjective feelings of loneliness; and
3. CU traits would be positively related to intimate exchange, unrelated to exclusivity, and unrelated to overall friendship satisfaction.

## Method

### Participants

Participants were 126 students attending an elementary school in the Midwestern United States. All children were students in one of eight mainstream classrooms that were in third, fourth, fifth, or sixth grade at the time of data collection. Of the 126 students in this sample, two were excluded because of concerns about the validity of their data (e.g., clear inability to understand the questions; random response patterns), resulting in a final sample of 124 children (45% boys;  $N = 56$ ) ranging in age from 8 to 13 years old ( $M = 10.5$ ;  $SD = 1.30$ ). Demographic characteristics were obtained using official school records. According to official school records, 96% ( $n = 119$ ) of children in this sample were White, which is consistent with the geographic location of the participating schools (95% White on the 2010 United States Census). Approximately 28% of the participating city population were identified as below the federal poverty line (median household income = \$30,299). In the current sample, 52% ( $n = 65$ ) received either free or reduced lunch, which was used as a proxy of socioeconomic status.

### Measures

**Demographic Characteristics** Official school records were used to obtain age, sex, race (White or other), and lunch status (free/reduced or paid) and were used as covariates in the current analyses (see Table 1).

### Externalizing Problems

**ADHD and Conduct Problems** The Vanderbilt ADHD Diagnostic Teacher Rating Scale (VADTRS) is a 35-item questionnaire that assesses symptoms of ADHD, conduct problem/oppositional-defiant behaviors, and anxiety/depression in youth (Wolraich et al. 2013; Wolraich et al. 1998). Teachers used a four-point Likert scale (0 = *never*, 1 = *occasionally*, 2 = *often*, 3 = *very often*) to respond to each

**Table 1** Descriptive statistics of demographic characteristics, externalizing problems, and social functioning

|  | %  | Mean  | SD    | Range  |
|--|----|-------|-------|--------|
| <b>Demographic Characteristic</b>              |    |       |       |        |
| Sex (% Male)                                   | 45 | --    | --    | --     |
| Race (% White)                                 | 96 | --    | --    | --     |
| Lunch Status (% Free/reduced)                  | 52 | --    | --    | --     |
| Age  | -- | 10.51 | 1.30  | 8–13   |
| <b>Externalizing Problems</b>                  |    |       |       |        |
| ADHD-hyperactivity/impulsivity sx              | -- | .49   | .59   | 0–2.6  |
| ADHD-inattention sx                            | -- | .82   | .85   | 0–3    |
| ADHD total sx                                  | -- | .66   | .66   | 0–2.7  |
| Conduct/oppositional sx                        | -- | .19   | .37   | 0–1.5  |
| Callous-unemotional traits (raw scores)        | -- | 3.37  | 2.52  | 0–8    |
| Callous-unemotional traits ( <i>T</i> -scores) | -- | 54.36 | 11.77 | 37–78  |
| <b>Measures of Social Functioning</b>          |    |       |       |        |
| Social Competence ( <i>T</i> )                 | -- | 2.86  | .93   | 1–4    |
| Social Competence ( <i>S</i> )                 | -- | 3.00  | .68   | 1.33–4 |
| Loneliness ( <i>S</i> )                        | -- | 3.28  | 3.76  | 0–16   |
| Intimate Exchange ( <i>S</i> )                 | -- | 4.02  | 1.06  | 1.67–5 |
| Exclusivity ( <i>S</i> )                       | -- | 1.74  | .74   | 1–4.6  |
| Overall Friendship Satisfaction ( <i>S</i> )   | -- | 4.58  | .83   | 1–5    |

sx symptoms, *T* teacher-rated, *S* student-rated. Lunch status: 0 = student does not receive free or reduced lunch, 1 = student receives free or reduced lunch. Race: 0 = non-White, 1 = White. Sex: 0 = male, 1 = female

item. The factor structure, validity, and reliability of these scales on the VADTRS have been well supported (Wolraich et al. 2013; Wolraich et al. 1998). For the purposes of the current study, mean scale scores were derived from the 18-item ADHD behavior subscale and from the 10-item conduct problem/oppositional-defiant behavior subscale as measures of ADHD and conduct problem symptoms, respectively. The internal consistency of these scales was excellent in the current sample (ADHD  $\alpha = .96$ ; conduct/oppositional  $\alpha = .90$ ).

**Callous-Unemotional Traits** The Antisocial Process Screening Device (APSD) is a 20-item questionnaire that assesses narcissism, impulsive, and CU traits in youth (Frick and Hare 2001). Teachers used a three-point Likert scale (0 = *not at all true*, 1 = *sometimes true*, 2 = *definitely true*) to respond to each item. Consistent with previous studies (e.g., Frick and Dantagnan 2005), only the six-item CU scale was used in the current study (e.g., “Is concerned about the feelings of others” reverse coded; “Feels bad or guilty when he/she does something wrong”). The factor structure, validity, and reliability of the CU scale on the APSD have been well supported (Frick et al. 2014). Items on the CU scale were summed creating raw scores for this measure. For descriptive purposes only, these scores were then converted to *T*-scores using published norms

based on age and gender (Frick and Hare 2001). The internal consistency of the CU scale was acceptable in the current sample ( $\alpha = .77$ ).

#### Peer Functioning

**Social Competence** The child and teacher versions of the Self-Perception Profile for Children (SPPC; Harter 2012) were used in the current study. The child version assesses the child’s perception of his or her competence in five specific domains (academic, social, athletic, physical appearance, and behavior) as well as their global self-worth. The teacher version assesses the child’s actual performance in the five specific domains. The child version includes six items to assess each domain whereas the teacher version includes three items to assess each domain (see Harter 2012). Given the purpose of the current study, only the social competence scale was examined here, which has satisfactory reliability and validity (Harter 2012). For each item, the participant was instructed to read a sentence with two opposing statements (e.g., “Some kids like the kind of person they are but other kids often wish they were someone else”), then choose which statement was most true for them/the student, and then determine if that statement was “sort of true” or “really true” for them/the student. Responses are scored from 1 to 4 with higher numbers indicating higher competence within that domain. Mean item scores of social competence were used in the current study, and internal consistencies were acceptable ( $\alpha = .78$ ) and excellent ( $\alpha = .96$ ) for child- and teacher-report, respectively.

**Loneliness** The Loneliness Questionnaire (LQ; Asher et al. 1984) was used in the current study to assess self-perceptions of the child’s ability to make friends and loneliness (e.g., “it’s hard for me to make friends at school”, “I’m lonely at school”). A nine-item short version with superior psychometric properties was used in the present study (Ebesutani et al. 2012). Each item is rated on a three-point Likert scale (1 = *hardly ever*, 2 = *sometimes*, 3 = *often*), with higher scores representing increased feelings of loneliness. A total sum score was used in the current study ( $\alpha = .84$ ).

**Close Friendship Quality** The Friendship Qualities Measure (FQM) asks children to think about their friendship with one of their close friends and to answer questions assessing multiple aspects of friendship quality (e.g., validation/caring; conflict; help/guidance) with that friend (Grotzinger and Crick 1996). Children responded using a five-point Likert scale (1 = *not at all true*, 2 = *hardly ever true*, 3 = *sometimes true*, 4 = *most of the time true*, 5 = *always true*). The six-item intimate exchange subscale includes three items assessing self-disclosure within the relationship (e.g., “I can tell him/her my secrets”) and three items assessing perceived disclosure from their close friend (e.g., “He/she can tell me his/her secrets”). Similarly, the 10-

item exclusivity subscale includes five items assessing self-desired exclusivity (e.g., “I get mad or upset if I see my friend hanging out with another kid”) and five items assessing friend-desired exclusivity (e.g., “My friend gets mad or upset if he or she sees me hanging out with another kid”). Mean scores across self- and other-desires for intimate exchange (across all 6 items;  $\alpha = .92$ ) and exclusivity (across all 10 items;  $\alpha = .88$ ) were calculated. Finally, as in previous research (Parker and Asher 1993), two items were used to assess global satisfaction in the close friendship that the child identified (i.e., “How is this friendship going?”, “How happy are you with this friendship?”). Children responded to each item using a five-point scale in which responses were labeled at each of the five boxes, with the most negative statement (i.e., “It’s going really badly”) on one pole, and the most positive statement (i.e., “It’s going really well”) on the opposite pole. Participants chose one of the five boxes for both questions, and these two items were averaged such that higher scores indicated greater overall friendship satisfaction ( $\alpha = .74$ ).

## Procedures

This study was reviewed and approved by a university Institutional Review Board. Data were collected as part of a larger study examining psychopathology and psychosocial functioning in a school-based sample of children (Becker 2014). Inclusion criteria for the study included placement in a mainstream classroom in third, fourth, fifth, or sixth grade at the time of data collection. Eight classrooms met study inclusion criteria, and the principal investigator (second author) described the study to all eight classroom teachers (all of whom were female). There were no exclusion criteria limiting teacher participation in this study. Teachers were told that study participation included completing measures for participating students and that they could withdraw their consent at any time. All eight eligible teachers provided signed informed consent to participate in the study. After teachers provided informed consent, the study was described to the students in each teacher’s classroom by research staff. There was a total of 199 students in these eight classrooms, and they were explicitly told that whether or not they participated in the study would have no impact on their grades. After answering all student questions, students were given informed consent forms to take home to their parents. The consent form informed parents that student participation in the study was fully optional, that providing consent allowed the student themselves and the student’s teacher to complete forms regarding their child, and that parents could revoke consent for participation in the study at any time. Parents were also given the e-mail address and phone number of the research team in the event that they had any questions or concerns. Students had two weeks to return the consent forms to the school. After one week, teachers were prompted by research staff to give

students who had not yet turned in the parent informed consent form a new copy to take home. Of the 199 total students in Grades 3–6 at the time informed consent was obtained, 161 (81%) returned their consent forms. Of those, 131 (81% of those who returned their consent forms) provided consent for their child to participate in the study, and 126 (96%) were still attending the school when the data used in the current analyses were collected, and a final sample of 124 students are included in the current study (as described above, two children were excluded due to validity concerns).

Participating students from each grade completed the surveys in a group setting lasting approximately 45 min, using rooms in the school (e.g., cafeteria, gym) with adequate space to ensure students’ privacy. Prior to completing measures, children provided verbal assent to the study. Specifically, students were told that their parents had given permission for them to answer questions for a project being conducted at their school but that their participation was fully optional. No student whose parent provided informed consent declined to participate in the study. Each child had their own packet of measures on which to record their responses. Research staff was continuously present to monitor pacing and answer questions. Student questions were addressed confidentially and individually, with children alerting staff of questions by raising their hand. Although no time limit was set for the completion of the measures, in a few cases (< 10) children were unable to maintain the pace of the group. When this occurred, research staff worked individually with the child. School staff was not present during survey administration and did not have access to the children’s answers to ensure confidentiality of their responses. Teachers were given a packet with the study measures to complete in reference to each participating student in April and were asked to complete the measures within a two-week timeframe. Teachers were compensated \$7 for each packet they completed, and children received a grade-appropriate book for their participation. To ensure complete data, questionnaires were reviewed by study staff, and students and teachers were given the opportunity to respond to any items that were inadvertently skipped; as a result, there were no missing data in this study.

## Analytic Strategy

Two sets of analyses were conducted. First, bivariate correlations were computed to assess the associations between CU, ADHD symptoms, and conduct problem symptoms and the various peer functioning measures, as well as the relationships across measures of social functioning. Second, to assess if CU traits were uniquely associated with peer functioning domains above and beyond other externalizing behaviors (i.e., ADHD and conduct problem symptoms), a series of hierarchical regressions were computed for each aspect of social functioning that was assessed. These hierarchical regressions included

demographic characteristics, symptoms of ADHD, symptoms of conduct problems (Step 1), and CU traits (Step 2). Based on zero-order correlation relationships, demographic characteristics (age, sex, race—White or other, and lunch status—reduced/free or paid) were only included in regression models if they were related to any of the independent variables (CU, ADHD symptoms, conduct problem symptoms) or the dependent variable of interest, as indicated by a statistically significant ( $p < .05$ ) bivariate correlation.

Skew and kurtosis values of the standard residuals were examined for normality of the residuals. Following recommendations by George and Mallery (2010), standardized residuals for all models with skew and kurtosis values below two were considered to be normally distributed. Across all standardized residuals, skew values were below this cutoff except for overall friendship satisfaction (skew =  $-2.04$ ). Kurtosis values were below this cutoff for all models except for friendship exclusivity (kurtosis =  $3.0$ ) and overall friendship satisfaction (kurtosis =  $5.4$ ). To correct for these abnormal values, a square root transformation was applied to friendship exclusivity (skew =  $1.09$ ; kurtosis =  $1.5$ ) and a log<sub>10</sub> transformation was applied to overall friendship satisfaction (kurtosis =  $1.6$ ). For ease of interpretation, results from the regressions using the original data are reported here given that the regressions with the transformed data replicated the pattern of results from the original data. In the regression models, all variance inflation factors were below two and all tolerance values were above  $.57$  suggesting no issues with multicollinearity in these analyses (Cohen et al. 2003).

## Results

### Bivariate Correlations

Bivariate correlations among study variables are presented in Table 2. Because age and sex were positively associated with some externalizing symptoms, they were included in all regression models. In addition, race (White or other) was included in one analysis (teacher-rated social competence). Table 2 shows that both CU traits and ADHD symptoms were associated with poorer peer functioning across all variables. However, conduct problems were associated with poorer peer functioning for only three variables: teacher-rated social competence ( $r = -.39, p < .01$ ), self-rated intimate exchange with a close friend (marginally significant;  $r = -.17, p < .10$ ), and self-rated demands for exclusivity ( $r = .19, p < .05$ ).

### Hierarchical Regressions

**Social Competence** Regressions were performed to assess the unique relationship between CU traits and teacher- and self-reported social competence. As summarized in Table 3, higher

levels of CU traits were significantly associated with lower levels of social competence across both raters after controlling for demographic characteristics and symptoms of ADHD and conduct problems (self-rated  $\beta = -.24, p < .05$ ; teacher-rated  $\beta = -.44, p < .01$ ). After inclusion of CU traits in the model, the relationship between ADHD and self-rated social competence remained significant such that higher symptoms of ADHD were associated with less perceived social competence ( $\beta = -.39, p < .05$ ). After inclusion of CU traits in the model, the relationship between conduct problems and teacher-rated social competence was reduced from marginally significant ( $\beta = -.19, p < .10$ ) to non-significance ( $\beta = -.06, ns$ ).

**Loneliness** As summarized in Table 3, after controlling for demographic characteristics and symptoms of ADHD and conduct problems, higher levels of CU traits were associated with higher ratings of loneliness ( $\beta = .23, p < .05$ ). After inclusion of CU traits in the model, higher symptoms of ADHD were still associated with higher ratings of loneliness ( $\beta = .38, p < .01$ ); however, *higher* levels of conduct problems became associated with *lower* levels of loneliness ( $\beta = -.23, p < .05$ ).

**Close Friendship Quality** As summarized in Table 3, after controlling for demographic characteristics and symptoms of ADHD and conduct problems, higher levels of CU traits were significantly associated with less intimate exchange ( $\beta = -.24, p < .05$ ) and less overall satisfaction in the close friendship ( $\beta = -.26, p < .05$ ), but CU traits were unassociated with friendship exclusivity ( $\beta = .05, ns$ ). After including CU traits in the models, higher ADHD symptoms remained significantly associated with increased demands for exclusivity ( $\beta = .35, p < .01$ ) and less overall satisfaction in the close friendship ( $\beta = -.30, p < .01$ ). In addition, in the final regression model, *higher* levels of conduct problems became associated with *higher* rates of overall friendship satisfaction ( $\beta = .27, p < .05$ ).

## Discussion

The purpose of the current study was to better understand whether CU traits were uniquely associated with children's social functioning above and beyond symptoms of ADHD and conduct problems. To do so, the current study examined the association between CU traits and several social functioning domains (i.e., social competence, loneliness, close friendship quality) before and after controlling for demographic characteristics and other externalizing symptoms (i.e., ADHD and conduct problems). CU traits were significantly correlated with poorer peer functioning for all six of the social functioning variables before controlling for demographics and other externalizing symptoms, and the relationship with five of these variables remained significant after controlling for demographics and other externalizing symptoms. These results suggest that

**Table 2** Intercorrelations of study variables

|                              | 1                | 2      | 3    | 4     | 5      | 6                 | 7      | 8      | 9      | 10     | 11     | 12     |
|------------------------------|------------------|--------|------|-------|--------|-------------------|--------|--------|--------|--------|--------|--------|
| 1. Age                       | –                |        |      |       |        |                   |        |        |        |        |        |        |
| 2. Sex                       | .04              | –      |      |       |        |                   |        |        |        |        |        |        |
| 3. Lunch Status              | –.03             | .17    | –    |       |        |                   |        |        |        |        |        |        |
| 4. Race                      | .24*             | –.19*  | –.11 | –     |        |                   |        |        |        |        |        |        |
| 5. ADHD                      | .04              | –.22*  | .13  | .09   | –      |                   |        |        |        |        |        |        |
| 6. CP                        | .22*             | –.16   | .10  | .11   | .57**  | –                 |        |        |        |        |        |        |
| 7. CU Traits                 | .03              | –.25** | .03  | .03   | .53**  | .51**             | –      |        |        |        |        |        |
| 8. Social Competence (T)     | –.12             | .09    | –.09 | –.19* | –.43** | –.39**            | –.54** | –      |        |        |        |        |
| 9. Social Competence (S)     | .17 <sup>+</sup> | –.11   | .01  | –.05  | –.34** | –.06              | –.27** | .41**  | –      |        |        |        |
| 10. Loneliness (S)           | .05              | –.07   | .04  | –.02  | .37**  | .12               | .31**  | –.44** | –.59** | –      |        |        |
| 11. Intimate exchange (S)    | .23*             | .26**  | .06  | –.02  | –.31*  | –.17 <sup>+</sup> | –.35** | .22*   | .32**  | –.25** | –      |        |
| 12. Exclusivity (S)          | –.03             | –.09   | .01  | –.02  | .36**  | .19*              | .22*   | –.20*  | –.34** | .35**  | –.24** | –      |
| 13. Overall Satisfaction (S) | .03              | –.04   | .01  | .12   | –.26** | –.02              | –.26** | .28**  | .43**  | –.47** | .36**  | –.24** |

Higher scores on externalizing symptoms, social acceptance, loneliness, and exclusivity indicate worse functioning. Lower scores on intimate exchange and overall satisfaction indicate worse functioning

ADHD ADHD total symptoms, CP conduct problem symptoms, CU callous-unemotional traits raw score, T teacher-rated, S student-rated. Lunch status: 0 = student does not receive free or reduced lunch, 1 = student receives free or reduced lunch. Race: 0 = non-White, 1 = White. Sex: 0 = male, 1 = female  
 \*\**p* < .01. \**p* < .05; <sup>+</sup>*p* < .10

CU traits are associated with a pattern of poorer peer functioning, which include less social competence, increased loneliness, and poorer quality within close dyadic friendships. Specific findings and implications for each domain of social functioning are discussed next.

**Social Competence**

Higher CU traits were significantly associated with poorer social competence across raters after controlling for other

externalizing symptoms. These findings are consistent with our hypothesis and with previous research documenting an association between CU traits and poorer self-rated (Haas et al. 2015) and teacher-rated (Barry et al. 2008) social competence. This study extends these findings by demonstrating that CU traits were the sole predictor of teacher-rated social competence when ADHD and conduct problem symptoms were also included in the model. This finding is consistent with the idea that CU traits are associated with poor peer functioning as viewed by the youth with CU traits themselves

**Table 3** Summary of hierarchical regression analyses

| Dependent Variable                 | Independent Variables |            |                   |        |              |                   |              |              |         |
|------------------------------------|-----------------------|------------|-------------------|--------|--------------|-------------------|--------------|--------------|---------|
|                                    | Step 1                |            |                   |        | Step 2       |                   |              |              |         |
|                                    | $\Delta R^2$          | $B_{ADHD}$ | $\beta_{CP}$      | F      | $\Delta R^2$ | $B_{ADHD}$        | $\beta_{CP}$ | $\beta_{CU}$ | F       |
| Social Competence (T) <sup>a</sup> | .19**                 | –.31**     | –.19 <sup>+</sup> | 7.34** | .12**        | –.17 <sup>+</sup> | –.06         | –.44**       | 10.83** |
| Social Competence (S)              | .16**                 | –.47**     | .15               | 7.21** | .04*         | –.39**            | .22*         | –.24*        | 7.09**  |
| Loneliness (S)                     | .15**                 | .46**      | –.16              | 5.46** | .03*         | .38**             | –.23*        | .23*         | 5.50**  |
| Intimate Exchange (S)              | .07**                 | –.25*      | –.05              | 6.93** | .04*         | –.17              | .02          | –.24*        | 6.84**  |
| Exclusivity (S)                    | .12**                 | .36**      | –.01              | 4.38** | .00          | .35**             | –.03         | .05          | 3.53**  |
| Overall Satisfaction (S)           | .10**                 | –.39**     | .18 <sup>+</sup>  | 3.37** | .05*         | –.30**            | .27*         | –.26*        | 4.04**  |

Step 1 in all models includes sex and age

All  $\beta$  values are standardized. Race was significant at step 1 for teacher-rated social competence ( $\beta = -.17, p < .05$ ). Sex was significant at step 1 for self-rated social competence ( $\beta = -.19, p < .05$ ) and at step 2 ( $\beta = -.22, p < .01$ ). Sex was significant at step 1 for intimate exchange ( $\beta = .19, p < .05$ ), and age was significant at both steps for intimate exchange ( $\beta = .24, p < .01$ ;  $\beta = .23, p < .01$ )

T teacher-rated, S student-rated

\*\* = *p* < .01; \* = *p* < .05; <sup>+</sup> = *p* < .10

<sup>a</sup> Race was also included in step 1



(Frick and Dantagnan 2005) and others (Piatigorsky and Hinshaw 2004).

### Loneliness

In contrast to our hypothesis, CU traits were associated with greater loneliness above and beyond ADHD and conduct problem symptoms. On one hand, this relationship may not be surprising given that CU traits were associated with high rates of poor social competence. Given previous research linking peer difficulties with poor subjective evaluations (Ladd and Troop-Gordon 2003), then, one may expect CU traits to also be associated with negative subjective feelings about peer rejection, including loneliness. On the other hand, it is perhaps surprising that traits associated with not caring about performance and having low empathy for others are positively associated with negative subjective feelings about peer rejection. One plausible reason for this finding is that CU traits are associated with not caring about performance in certain contexts but not others. This is a similar interpretation to that given by Lahey (2014) who hypothesized that CU traits may be associated with shallow affect, but only for a subset of emotions (e.g., empathy, guilt) and not across all emotions (e.g., happiness, frustration), suggesting that children with elevated CU traits can in fact experience a range for other emotions. In a similar way, CU traits may be associated with not caring about poor academic or athletic performance or poor behaviors (see Haas et al. 2015), but children with elevated CU traits may in fact care about poor social performance, particularly if they feel lonely in their social relationships. Future research is needed to examine this distinction further, specifically in terms of the relationship between CU traits and loneliness.

### Close Friendship Quality

Consistent with our hypothesis, CU traits were unrelated to demands for exclusivity in close friendships. Inconsistent with our other hypotheses, however, CU traits were found to be associated with less intimate exchange and less overall satisfaction with a close friend. It is interesting that CU traits were not associated with higher levels of intimate exchange based on our hypothesis that youth with elevated CU traits may engage in relationships to use peers for their own gain (Munoz et al. 2008). It may be that our measure was not specific enough to tap the demands for exclusivity for different purposes and CU traits may not be related to preferences for exclusivity when there is no potential gain for the child. The finding of a negative relationship between CU traits and overall close friendship satisfaction may suggest that children with elevated CU traits may care about their close friendships and desire to have better friendships. However, it is important to note that we used only self-report for assessing these

dimensions of friendship satisfaction and past work suggests that youth with elevated CU traits may underestimate the quality of their peer relationships relative to how they are viewed by their peers (Munoz et al. 2008).

### Intervention Implications

The positive association between CU traits and loneliness was particularly surprising given that children with high levels of CU traits often lack distress for their misbehavior (Frick and Morris 2004). Interestingly, this finding may suggest that although CU traits are associated with a lack of distress following misbehavior, they may in fact care about the negative consequences that result from their misbehavior, particularly if those consequences have social implications. If loneliness indeed serves as an indicator that children with CU traits care about their peer relationships and show genuine concern about their social performance, this provides support for the possibility that good social functioning could serve as a protective factor for children with CU traits to either reduce the stability of these traits or reduce the level of behavior problems displayed by them (Barry et al. 2008; Frick and Dantagnan 2005). That is, whereas others have identified social skills interventions as important for children with elevated CU traits, this study bolsters this suggestion and extends it by suggesting that decreasing loneliness may provide motivation for children with elevated CU traits to improve their social competence. This implication is important because it provides a potential treatment goal for social skills interventions for this particularly severe subgroup of children, which is especially important given that CU traits are often associated with poor response to parent-only and parent/child behavioral training interventions (Hawes et al. 2014).

Thus, the current study strengthens the argument for focusing on social skills interventions aimed at reducing conduct problems in children with elevated CU traits. Although social skills interventions are often recommended for children with ADHD (Pelham et al. 1998) and children with conduct problems (Webster-Stratton et al. 2001), these interventions should be modified to address the unique social style of children with CU traits. For example, Graziano and Garcia (2016) proposed a model delineating the various processes of emotion dysregulation in ADHD. The results of their meta-analysis suggest that ADHD is associated with deficits early into the perception of emotional cues (e.g., encoding; processing) whereas CU traits may play a role in the response to emotional cues (e.g., empathy). If true, our study suggests that children with ADHD and CU traits may require interventions aimed at multiple social skills, including how to appropriately perceive and respond to emotional cues. Furthermore, if CU traits are in fact associated with relatively accurate perceptions of social competence, measures of self-perceptions may be used to assess treatment effectiveness.

Given the fact that children with CU traits are described as “not caring” about their performance or about other people (Pardini 2011), it may be important to understand how to motivate children with these traits to engage in social skills treatment. Distress is considered to result when one desires to have more (i.e., higher quantity) or better (i.e., higher quality) close friendships than they currently do (Peplau 1985). In this study, higher CU traits were associated with children rating themselves as less socially competent, lonelier, and in close friendships of poorer quality. If CU traits are associated with distress over the poor quantity or quality of peer relationships, children with elevated CU traits may be motivated to improve their peer relationships and therefore benefit from social skills interventions. It may be particularly important to consider the use of stimulant medication in addition to social skills intervention for children with conduct problems and CU traits (Waschbusch et al. 2007a). However, as suggested by others (Waschbusch et al. 2007a; Wall et al. 2016), the impact of stimulant medication needs to be empirically examined to determine if “better impulse control actually results in lower levels of [conduct problems] or whether it leads a child to act in more covert ways and avoid being rated by parents as showing [conduct problems]” (Wall et al. 2016; p.980).

### ADHD and Conduct Problem Symptoms in Relation to Peer Functioning

Similar to the pattern of CU traits in relation to social functioning, ADHD symptoms were uniquely associated with a pattern of poorer social functioning across variables. However, in contrast to CU traits, ADHD was not significantly associated with poorer teacher-rated social competence after controlling for other externalizing domains. In addition, CU traits and ADHD symptoms showed a differential association with friendship intimacy exchange and friendship exclusivity in the final regression model: ADHD symptoms alone were associated with greater exclusivity whereas CU traits alone were associated with less intimate exchange. This is consistent with previous research documenting greater friendship exclusivity in children with ADHD (Normand et al. 2011).

In contrast to CU traits and ADHD symptoms, conduct problem symptoms were either unassociated with or were uniquely associated with *better* social functioning after controlling for other externalizing domains. For example, the current data show that more conduct problem symptoms are associated with lower rates of loneliness, which contradicts previous research (Boivin et al. 1994). In addition, we found that conduct problem symptoms were not significantly associated with self-rated social competence, loneliness, or overall friendship satisfaction in bivariate correlation analyses, yet they were significantly associated with better functioning in each of these domains after controlling for other externalizing symptoms. It is intriguing

that the residual components of conduct problem symptoms, after controlling for shared variance with other externalizing symptoms, were associated with better social functioning within these domains (higher perceived social competence, less loneliness, and better overall friendship satisfaction). However, it is unclear at this time if these findings reflect actual improved performance or simply better perceived performance (e.g., positive illusory bias) in social functioning.

Although the relationship between conduct problem symptoms and better social functioning starts to emerge after ADHD is taken into account, they do not become significant until CU traits are also accounted for. This may indicate that the unique features of conduct problems not associated with ADHD and CU traits, perhaps aggressive behaviors and defying societal rules, may be related to better social functioning. One potential explanation for this finding is that without difficulties in regulating one’s emotions (ADHD) and without empathy and guilt deficits (CU traits), children with antisocial behaviors are able to form social bonds with other antisocial children. This is consistent with the notion of socialized Conduct Disorder (see Frick and Ellis 1999), and more recently with the suggestion that some children with conduct problems are able to connect with other deviant peers (Frick and Dantagnan 2005). Another possibility is that these unique features of conduct problems are associated with an inflated sense of self that is not consistent with how others perceive the behavior. Interestingly, teacher-rated social competence was not found to be significantly associated with conduct problems after ADHD and CU traits were controlled for, perhaps providing some evidence for this hypothesis. It is important for future research to examine these possibilities.

Taken together, these findings highlight the importance of simultaneously considering different externalizing domains when examining associations with social functioning. That is, much of the association of poor peer relationships with conduct problems seem to be due to common co-occurring conditions; namely, ADHD and CU traits. Thus, tailoring interventions for children with conduct problems needs to consider the presence of these co-occurring conditions, especially interventions focusing on a child’s social functioning.

### Implication of Teacher Ratings of Externalizing Symptoms

Our findings and implications should be considered preliminary given that externalizing symptoms were assessed solely by teachers. Evidence-based assessment of ADHD and conduct problems require parent and teacher ratings (De Los Reyes et al. 2009; Pliszka 2007) because of the frequent disagreement between informants (Antrop et al. 2002). Relying solely on teacher ratings for symptoms of

ADHD and conduct problems may have resulted in lower levels of these symptoms in our sample and may have reduced our ability to detect some effects.

The recommendations for how to best assess youth CU traits is much less developed than that of ADHD and conduct problems. Whereas some researchers have speculated that combining parent and teacher ratings may be most useful for similar reasons that combining ratings are useful for ADHD and conduct problems (Frick et al. 2003), other researchers suggest that relying solely on teacher ratings of CU traits may be better (Haas et al. 2014). In fact, Barry et al. (2008) suggest that teacher ratings of CU traits may be most important when examining the relationship between CU traits and social relationships because of “the unique position of teachers to evaluate peer relationships and social competence” (p.28). Thus, it is unclear what impact our use of teacher-only ratings of youth CU traits had on the current findings. Thus, it is important to consider the current findings in this study as preliminary, and to suggest that future research use a multi-informant approach for assessing externalizing symptoms is needed.

### Limitations and Future Directions

Findings from this study should be considered in light of several limitations that point the way for future research in this area. First, our findings in a non-referred sample of children recruited from a single elementary school with limited ethnic diversity may not generalize to clinical and more representative samples. Replication will be important to better assess the generalizability and clinical implications of the current findings. Second, testing gender differences in the associations with peer relationships should be conducted in larger samples that are adequately powered to examine interaction effects. Previous research suggests that there are gender differences in the relationship between CU traits and aggression (Marsee et al. 2011), and this may also be true for other social functioning variables. Third, although a number of social functioning variables were examined in the current study, more research is needed to examine CU traits in relation to additional social functioning variables, including the use of parent and peer ratings and sociometric nominations, as well as other domains of friendship. Fourth, the nature of the data used in the current study is cross-sectional and longitudinal research may further clarify the implications of these findings. Despite these noted limitations, the findings from the current study highlight important theoretical and clinical implications for CU traits in non-referred children in demonstrating a significant association between CU traits and poorer functioning across a range of peer functioning domains.

**Acknowledgments** We would like to thank the many families, teachers, and research assistants who helped make this project possible.

### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

### References

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.
- Andrade, B. F., Sorge, G. B., Djordjevic, D., & Naber, A. R. (2015). Callous-unemotional traits influence the severity of peer problems in children with impulsive/overactive and oppositional/defiant behaviors. *Journal of Child and Family Studies, 24*, 2183–2190.
- Antrop, I., Roeyers, H., Oosterlaan, J., & Van Oost, P. (2002). Agreement between parent and teacher ratings of disruptive behavior disorders in children with clinically diagnosed ADHD. *Journal of Psychopathology and Behavioral Assessment, 24*, 67–73.
- Asher, S. R., & Paquette, J. A. (2003). Loneliness and peer relations in childhood. *Current Directions in Psychological Science, 12*, 75–78.
- Asher, S. R., Hymel, S., & Renshaw, P. D. (1984). Loneliness in children. *Child Development, 55*, 1456–1464.
- Asher, S. R., Parker, J. G., & Walker, D. L. (1996). Distinguishing friendship from acceptance: Implications for intervention and assessment. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship during childhood and adolescence* (pp. 366–405). New York: Cambridge University Press.
- Babiak, P., & Hare, R. D. (2006). *Snakes in suits: When psychopaths go to work*. New York: Regan Books.
- Bagwell, C. L., & Coie, J. D. (2004). The best friendships of aggressive boys: Relationship quality, conflict management, and rule-breaking behavior. *Journal of Experimental Child Psychology, 88*, 5–24.
- Barry, T. D., Barry, C. T., Deming, A. M., & Lochman, J. E. (2008). Stability of psychopathic characteristics in childhood: The influence of social relationships. *Criminal Justice and Behavior, 35*, 244–262.
- Becker, S. P. (2014). Sluggish cognitive tempo and peer functioning in school-aged children: A six-month longitudinal study. *Psychiatry Research, 217*, 72–78.
- Becker, S. P., Luebke, A. M., & Langberg, J. M. (2012). Co-occurring mental health problems and peer functioning among youth with attention-deficit/hyperactivity disorder: A review and recommendations for future research. *Clinical Child and Family Psychology Review, 15*, 279–302.
- Becker, S. P., Fite, P. J., Luebke, A. M., Stoppelbein, L., & Greening, L. (2013). Friendship intimacy exchange buffers the relation between ADHD symptoms and later social problems among children attending an after-school care program. *Journal of Psychopathology and Behavioral Assessment, 35*, 142–152.
- Blair, R. J. R., Colledge, E., Murray, L., & Mitchell, D. G. V. (2001). A selective impairment in the processing of sad and fearful expressions

- in children with psychopathic tendencies. *Journal of Abnormal Child Psychology*, 29, 491–498.
- Boivin, M., Poulin, F., & Vitaro, F. (1994). Depressed mood and peer rejection in childhood. *Development and Psychopathology*, 6, 483–498.
- Bukowski, W. M., & Hoza, B. (1989). Popularity and friendship: Issues in theory, management, and outcome. In T. J. Berndt & G. W. Ladd (Eds.), *Peer relations in child development* (pp. 15–45). New York: Wiley.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). London: Routledge Academic.
- De Los Reyes, A., Henry, D. B., Tolan, P. H., & Wakschlag, L. S. (2009). Linking informant discrepancies to observed variations in young children's disruptive behavior. *Journal of Abnormal Child Psychology*, 37, 637–652.
- Ebesutani, C., Drescher, C. F., Reise, S. P., Heiden, L., Hight, T. L., Damon, J. D., & Young, J. (2012). The loneliness questionnaire—short version: An evaluation of reverse-worded and non-reverse-worded items via item response theory. *Journal of Personality Assessment*, 94, 427–437.
- Frick, P. J., & Dantagnan, A. L. (2005). Predicting the stability of conduct problems in children with and without callous-unemotional traits. *Journal of Child and Family Studies*, 14, 469–485.
- Frick, P. J., & Ellis, M. (1999). Callous-unemotional traits and subtypes of conduct disorder. *Clinical Child and Family Psychology Review*, 2, 149–168.
- Frick, P. J., & Hare, R. D. (2001). *Antisocial process screening device: APSD*. Toronto: Multi-Health Systems.
- Frick, P. J., & Morris, A. S. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 33, 54–68.
- Frick, P. J., Cornell, A. H., Bodin, S. D., Dane, H. E., Barry, C. T., & Loney, B. R. (2003). Callous-unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*, 39, 246–260.
- Frick, P. J., Ray, J. V., Thomson, L. C., & Kahn, R. E. (2014). Can callous-unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychological Bulletin*, 140, 1–57.
- Furman, W., & Robbins, P. (1985). What's the point? Issues in the selection of treatment objectives. In B. H. Schneider, K. H. Rubin, & J. E. Ledingham (Eds.), *Children's peer relations: Issues in assessment and intervention* (pp. 41–56). New York: Springer-Verlag.
- Gardner, D. M., & Gerdes, A. C. (2015). A review of peer relationships and friendships in youth with ADHD. *Journal of Attention Disorders*, 19, 844–855.
- George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.)* Boston: Pearson.
- Graziano, P. A., & Garcia, A. (2016). Attention-deficit hyperactivity disorder and children's emotion dysregulation: A meta-analysis. *Clinical Psychology Review*, 46, 106–123.
- Greene, R. W., Biederman, J., Faraone, S. V., Ouellette, C. A., Penn, C., & Griffin, S. M. (1996). Toward a new psychometric definition of social disability in children with attention-deficit hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 571–578.
- Grotzpete, J. K., & Crick, N. R. (1996). Relational aggression, overt aggression, and friendship. *Child Development*, 67, 2328–2338.
- Haas, S. M., Waschbusch, D. A., Pelham, W. E., King, S., Andrade, B. F., & Carrey, N. J. (2011). Treatment response in CP/ADHD-only children with callous/unemotional traits. *Journal of Abnormal Child Psychology*, 39, 541–552.
- Haas, S. M., Morrison, L., Waschbusch, D. A., Willoughby, M. W., Derefinko, K. J., Helseth, S., Crum, K., Altszuler, A., Ross, J. M., Coles, E., & Pelham, W. (2014, March). Validity of multiple informant evaluations of callous-unemotional traits in children with conduct problems. In *Presented at the American-psychology law society (APLS) annual meeting*. New Orleans.
- Haas, S. M., Waschbusch, D. A., King, S., & Walsh, T. M. (2015). Examining the role of callous-unemotional traits in the attribution styles and self competence evaluations of children with conduct problems and ADHD. *Journal of Psychopathology and Behavioral Assessment*, 37, 196–206. doi:10.1007/s10862-014-9459-5.
- Harter, S. (2012). *Self-perception profile for children: Manual and questionnaires*. University of Denver: Unpublished manuscript.
- Hawes, D. J., Price, M. J., & Dadds, M. R. (2014). Callous-unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. *Clinical Child and Family Psychology Review*, 17, 248–267.
- Houghton, S., Roost, E., Carroll, A., & Brandtman, M. (2015). Loneliness in children and adolescents with and without attention-deficit/hyperactivity disorder. *Journal of Psychopathology and Behavioral Assessment*, 37, 27–37.
- Hoza, B. (2006). Peer functioning in children with ADHD. *Journal of Pediatric Psychology*, 32, 655–663.
- Hoza, B., Pelham, W. E., Milich, R., Pillow, D., & McBride, K. (1993). The self-perception and attributions of attention deficit hyperactivity disorder and nonreferred boys. *Journal of Abnormal Child Psychology*, 21, 271–286.
- Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham Jr., W. E., Molina, B. S., et al. (2004). Self-perceptions of competence in children with ADHD and comparison children. *Journal of Consulting and Clinical Psychology*, 72, 382–391.
- Hughes, J. N., Cavell, T. A., & Grossman, P. B. (1997). A positive view or self: Risk or protection for aggressive children? *Development and Psychopathology*, 9, 75–94.
- Ladd, G. W. (1999). Peer relationships and social competence during early and middle childhood. *Annual Review of Psychology*, 50, 333–359.
- Ladd, G. W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development*, 74, 1344–1367.
- Lahey, B. H. (2014). What we need to know about callous-unemotional traits: Comment on Frick et al. (2013). *Psychological Bulletin*, 140, 58–63.
- Marsee, M. A., Barry, C. T., Childs, K. K., Frick, P. J., Kimonis, E. R., Muñoz, L. C., et al. (2011). Assessing the forms and functions of aggression using self-report: Factor structure and invariance of the peer conflict scale in youths. *Psychological Assessment*, 23, 792–804.
- Munoz, L. C., Kerr, M., & Besic, N. (2008). The peer relationships of youth with psychopathic personality traits: A matter of perspective. *Criminal Justice and Behavior*, 35, 212–227.
- Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin*, 113, 99–128.
- Normand, S., Schneider, B. H., Lee, M. D., Maisonneuve, M., Kuehn, S. M., & Robaey, P. (2011). How do children with ADHD (mis)manage their real-life dyadic friendships? A multi-method investigation. *Journal of Abnormal Child Psychology*, 39, 293–305.
- Pardini, D. A. (2006). The callousness pathway to severe violent delinquency. *Aggressive Behavior*, 32, 590–598.
- Pardini, D. (2011). Perceptions of social conflicts among incarcerated adolescents with callous-unemotional traits: 'You're going to pay. It's going to hurt, but I don't care'. *Journal of Child Psychology and Psychiatry*, 52, 248–255.
- Pardini, D. A., & Fite, P. J. (2010). Symptoms of conduct disorder, oppositional defiant disorder, attention-deficit/hyperactivity disorder, and callous-unemotional traits as unique predictors of psychosocial maladjustment in boys: Advancing an evidence base for DSM-V. *Journal of the American Academy of Child and Adolescent Psychiatry*, 49, 1134–1144.
- Pardini, D. A., Obradovic, J., & Loeber, R. (2006). Interpersonal callousness, hyperactivity/impulsivity, inattention, and conduct problems as precursors to delinquency persistence in boys: A comparison of

- three grade-based cohorts. *Journal of Clinical Child and Adolescent Psychology*, 35, 46–59.
- Parker, J. G., & Asher, S. R. (1993). Friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*, 29, 611–621.
- Parker, J. G., Low, C. M., Walker, A. R., & Gamm, B. K. (2005). Friendship jealousy in young adolescents: Individual differences and links to sex, self-esteem, aggression, and social adjustment. *Developmental Psychology*, 41, 235–250.
- Pelham, W. E., Gnagy, E. M., & Greiner, A. R. (1998). Children's summer day treatment program manual. Buffalo: Comprehensive Treatment for Attention Deficit Disorder.
- Peplau, L. A. (1985). Loneliness research: Basic concepts and findings. In I. J. Sarason & B. R. Sarason (Eds.), *Social support: Theory, research, and applications*. Boston: Martinus Nijhoff.
- Piatigorsky, A., & Hinshaw, S. P. (2004). Psychopathic traits in boys with and without attention-deficit/hyperactivity disorder: Concurrent and longitudinal correlates. *Journal of Abnormal Child Psychology*, 32, 535–550.
- Pliszka, S. (2007). Practice parameter for the assessment and treatment of children and adolescents with attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 46, 894–921.
- Qualter, P., Brown, S. L., Munn, P., & Rotenberg, K. J. (2010). Childhood loneliness as a predictor of adolescent depressive symptoms: An 8-year longitudinal study. *European Child & Adolescent Psychiatry*, 19, 493–501.
- Rodkin, P. C., Farmer, T. W., Pearl, R., & Van Acker, R. (2000). Heterogeneity of popular boys: Antisocial and prosocial configurations. *Developmental Psychology*, 36, 14–24.
- Scholtens, S., Diamantopoulou, S., Tillman, C. M., & Rydell, A. M. (2012). Effects of symptoms of ADHD, ODD, and cognitive functioning on social acceptance and the positive illusory bias in children. *Journal of Attention Disorders*, 16, 685–696.
- Swanson, E. N., Owens, E. B., & Hinshaw, S. P. (2012). Is the positive illusory bias illusory? Examining discrepant self-perceptions of competence in girls with ADHD. *Journal of Abnormal Child Psychology*, 40, 987–998.
- Van Zalk, M. H. W., & Van Zalk, N. (2015). Violent peer influence: The roles of self-esteem and psychopathic traits. *Development and Psychopathology*, 27, 1077–1088.
- Wall, T. D., Frick, P. J., Fanti, K. A., Kimonis, E. R., & Lordos, A. (2016). Factors differentiating callous-unemotional children with and without conduct problems. *Journal of Child Psychology and Psychiatry*, 57, 976–983.
- Waschbusch, D. A. (2002). A meta-analytic examination of comorbid hyperactive-impulsive-attention problems and conduct problems. *Psychological Bulletin*, 128, 118–150.
- Waschbusch, D. A., & Willoughby, M. T. (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.
- Waschbusch, D. A., Carrey, N. J., Willoughby, M. T., King, S., & Andrade, B. F. (2007a). Effects of methylphenidate and behavior modification on the social and academic behavior of children with disruptive behavior disorders: The moderating role of callous/unemotional traits. *Journal of Clinical Child and Adolescent Psychology*, 36, 629–644.
- Waschbusch, D. A., Walsh, T. M., Andrade, B. F., King, S., & Carrey, N. J. (2007b). Social problem solving, conduct problems, and callous-unemotional traits in children. *Child Psychiatry and Human Development*, 37, 293–305.
- Webster-Stratton, C., & Lindsay, D. W. (1999). Social competence and conduct problems in young children: Issues in assessment. *Journal of Clinical Child Psychology*, 28, 25–43.
- Webster-Stratton, C., Reid, M. J., & Hammond, M. (2001). Preventing conduct problems, promoting social competence: A parent and teacher training partnership in head start. *Journal of Clinical Child Psychology*, 30, 283–302.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548–573.
- Wolraich, M. L., Hannah, J. N., Baumgaertel, A., & Feurer, I. D. (1998). Examination of DSM-IV criteria for attention deficit/hyperactivity disorder in a county-wide sample. *Journal of Developmental & Behavioral Pediatrics*, 19, 162–168.
- Wolraich, M. L., Bard, D. E., Neas, B., Doffing, M., & Beck, L. (2013). The psychometric properties of the Vanderbilt attention-deficit hyperactivity disorder diagnostic teacher rating scale in a community population. *Journal of Developmental & Behavioral Pediatrics*, 34, 83–93.