



Bad Boys and Mean Girls: Callous-Unemotional Traits, Management of Disruptive Behavior in School, the Teacher-Student Relationship and Academic Motivation

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Callous-unemotional (CU) traits comprise a temperament dimension characterized by low empathy, interpersonal callousness, restricted affect and a lack of concern for performance. CU traits are the hallmark feature of psychopathy in youth and are associated with more varied, severe and stable antisocial behavior. However, little is known about the presentation, impact and correlates of CU traits in schools. We conducted a mixed methods study investigating the relationships between CU traits, student disruptive behavior, responses to classroom management strategies, teacher-student relationship quality and academic motivation. Participants comprised 437 children aged 11–14 years ($M = 12.5$ years, 51% female) and 12 teachers recruited from a state school in England. Teacher participants consisted of 8 women and 4 men aged 23–51 ($M = 35.27$ years, $SD = 10.43$). Children completed the Inventory of Callous-Unemotional Traits (ICU; Frick, 2004). Teachers then completed an interview and questionnaires for a randomly selected subsample of students who (i) scored in the top 25% on student report of CU traits ($n = 24$), and (ii) scored below the median ($n = 23$). Thematic analysis of teacher interviews revealed that high CU children display more frequent, severe antisocial behavior in school. Teachers reported that high CU students were resistant to teacher discipline strategies, often showing intense displays of anger in response to their attempts to set limits. High CU students appeared to be less responsive to social rewards (e.g., praise). Encouragingly, some teachers reported a good relationship with a child identified as high in CU traits, despite recognizing that this student's behavior made it difficult for other teachers to maintain a harmonious classroom environment. Teachers attributed the poor academic performance of children high in CU traits to a lack of motivation, reporting the need for intense monitoring and feedback to ensure that these students completed schoolwork. Findings suggest that risk pathways for poor school outcomes may differ for antisocial children high and low in CU traits, and emphasize the need to modify existing school-based interventions to promote academic engagement and prosocial behavior in this high-risk subgroup of antisocial children.

Keywords: psychopathy, antisocial behavior, teacher-child relationship, academic motivation, classroom management, discipline, teacher-child interaction, callous-unemotional (CU) traits

INTRODUCTION

Disruptive behavior in schools has a strong negative impact on student academic engagement and achievement, classroom functioning and interpersonal relationships in school (Herrero et al., 2006; Thomas et al., 2011; McEachern and Snyder, 2012). Antisocial behavior is a major contributor to teacher stress and burnout, due to the strain of managing disruptive behavior and even student aggression directed toward teachers (Espelage et al., 2013; Friedman-Krauss et al., 2014; Longobardi et al., 2018). Disruptive behaviors predict school dropout, truancy, school exclusion and are the most common reason for referral to special education and mental health services (Kim-Cohen et al., 2005; Department for Education, 2010). In the longer-term, antisocial behavior can lead to violence and criminal offending, unemployment, relationship instability, health problems and early mortality (Moffitt, 2018). In terms of economic burden, evidence indicates that the greatest cost of externalizing problems appears to be borne by education services (Snell et al., 2013).

There is an abundance of evidence that subtyping antisocial youth on the basis of callous-unemotional (CU) traits has substantial utility in elucidating the differing developmental pathways for antisocial behavior (Frick and Morris, 2004). CU traits are a temperament dimension characterized by low empathy, guilt, emotionality and a lack of concern for performance (Frick et al., 2014a,b). CU traits are considered to be the core feature of psychopathic traits in youth, and are related to a more varied, severe and chronic trajectory of antisocial behavior (Frick et al., 2003; McMahan et al., 2010). Youth high in CU traits are motivated by social dominance, viewing aggression as an effective means of achieving their desired goals and lacking concern about the consequences of their behavior for themselves or others, including anticipated disciplinary action, feelings of guilt or victim distress (Pardini and Byrd, 2012). In addition, youth with CU traits show reduced recognition and responsiveness to nonverbal punishment cues including fearful facial expressions, vocal tones and body postures (Blair et al., 2005; Jones et al., 2009; Muñoz, 2009). These unique correlate and poor prognosis have resulted in the inclusion of CU traits as a specifier for Conduct Disorder in the most recent edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5; American Psychiatric Association, 2013), under the term “limited prosocial emotions.”

While the vast majority of research on contextual factors and CU traits has focused on the family environment, emerging evidence suggests that their unique emotional, cognitive, social and motivational style may also place children with CU traits at risk for poor outcomes in the school domain. CU traits are associated with more severe disruptive behavior in the classroom and hence more frequent discipline at school (Waschbusch and Willoughby, 2008; Ciucci et al., 2014; Waschbusch et al., 2015), direct and indirect bullying toward peers (Muñoz et al., 2011; Ciucci et al., 2014; Thornberg and Jungert, 2017), and low levels of peer support and school connectedness (Fanti et al., 2017; Haas et al., 2018). One rich potential source of information concerning contextual risks and assets for youth high in CU traits is the nature and quality of

teacher-student interaction and relationships. Discipline and reward-based classroom management strategies and teacher-student relationship quality are a common focus of teacher education and training programmes aimed at promoting prosocial behavior and school engagement (e.g., Emmer and Stough, 2001; Anderson et al., 2004). A deeper understanding of the influence of teacher-child interaction and relationships in developmentally important areas for children high in CU traits, as well as how these factors may be intertwined, is therefore likely to be invaluable for informing school-based intervention.

The potential impact of the punishment insensitivity that characterizes youth with CU traits on their interactions and relationships with teachers has received little attention. Punishment insensitivity is associated with impaired associative learning, with others' distress or disapproval failing to elicit a negative emotional response (Kochanska, 1994; Blair, 1995). A conditioned association is therefore not formed between misbehavior and the negative emotional consequences of punishment (e.g., guilt, shame), increasing the likelihood that the child will repeat the misbehavior in future. CU traits is linked to reduced emotional arousal in response to others' distress cues or to punishment-oriented socialization techniques (Pardini and Frick, 2013). High levels of temperamental fearlessness, a precursor to CU traits, are believed to impair the development of emotions (e.g., empathy, guilt) related to optimal conscience development (Fowles and Kochanska, 2000). Therefore, fearlessness may lead to the development of antisocial behavior and CU traits due to an insensitivity to punishment-oriented moral and social norms conveyed by significant others in the child's world, including parents, peers and teachers.

Models of the development of CU traits have also highlighted the role of impaired reward processing (e.g., Newman et al., 1997; Frick et al., 2014b). Children high in CU traits have been described as possessing a “reward-dominant” behavioral style, where youth will pursue a goal despite the risk of negative consequences for themselves or others (O'Brien and Frick, 1996; Fisher and Blair, 1998). However, there is also evidence suggesting that youth high in CU traits show reduced reward sensitivity (Marini and Stickle, 2010; Centifanti and Modecki, 2013). The reasons for these inconsistent findings are unclear, but one possibility is that children with CU traits show differential responding to different types of reward (Waller et al., 2013). For example, there is some evidence that children with CU traits may be more responsive to tangible rewards and to social rewards that enhance their social status or opportunities for social dominance (Pardini et al., 2003; Lorber et al., 2011). In contrast, youth high in CU traits may be less responsive to rewards that involve social approval and social connection, in the form of close, positive relationships with others (Frederickson et al., 2013).

Only a small number of studies have investigated responses to teacher discipline and reward-based strategies in youth with CU traits. A mixed methods study conducted by Allen et al. (2016) indicated that teachers viewed high CU children as either unresponsive or negative in their responses to nonverbal reward and punishment cues (e.g., smiling, frowns) and tangible rewards. Teacher attempts at discipline were either ignored or responded to with disproportionate levels of verbal aggression;

sending the student out of class was the only discipline strategy teachers viewed as effective. High CU students appeared to enjoy praise and being awarded a position of responsibility, but with unintended side effect of then using these rewards to “show off” to their peers or abusing their new-found position of responsibility. However, other teachers viewed praise as helpful for promoting prosocial behavior in high CU children. It should be noted that this study featured a small, boys-only sample ($N = 39$) and interviews elicited teacher views in response to a general description of youth high in CU traits, rather than asking teachers to report on specific children. Another innovative study personalized school-based intervention for children with CU traits by emphasizing reward-based strategies and de-emphasizing discipline strategies, achieving significant reductions in conduct problems and CU traits (Frederickson et al., 2013). While this study was conducted in one special education school ($N = 29$) and lacked a control condition, findings provide optimism for discipline and reward-based classroom management strategies as an intervention target for students high in CU traits.

The influence of teacher-student relationship quality for high CU children has also received little attention, but the limited available evidence shows strong relationships between CU traits, greater teacher-child conflict and less closeness (Crum et al., 2016; Horan et al., 2016). While it may be difficult to form a close relationship with children high in CU traits given their challenging temperament profile, longitudinal research emphasizes the benefits of positive relationships with parents and peers in the form of significant decreases in CU traits and conduct problems over time (Pardini et al., 2007; Hawes et al., 2011; Fanti et al., 2017). Emotional support from teachers has been shown to be important in the middle school period, with teachers who convey warmth, acceptance and who strive to develop student interest in academic and social pursuits producing positive benefits in terms of student behavior, motivation and academic performance (Wentzel, 1998). Positive relationships with teachers at this developmental stage may be particularly salient for students with problematic relationships with parents and peers (Harter, 1996).

Promoting positive teacher-student relationships as a means of increasing academic engagement may be particularly important for high CU children given increasing evidence for a link between CU traits and poor academic achievement, even when controlling for IQ levels, conduct problems and inattention/hyperactivity (DeLisi et al., 2011; Vaughn et al., 2011; Horan et al., 2016). Indeed, CU traits in antisocial youth are unrelated to deficits in verbal ability (Allen et al., 2013), commonly cited as a major factor contributing to school failure in antisocial youth (Moffitt, 1993). It has therefore been suggested that youth high in CU traits perform poorly despite possessing a similar IQ to their same-age peers due to low intrinsic motivation and therefore engagement with school work (DeLisi et al., 2011; Ciucci et al., 2014). Reciprocal relations between CU traits and teacher-child interaction have also been identified as potential causes of low grades, with DeLisi et al. (2011) suggesting that high CU children may showing reduced responsivity to teacher practices that facilitate prosocial behavior and engagement in

learning. Conversely, children with CU traits may elicit harsh responses from teachers, coupled with less encouragement and feedback placing them at an academic disadvantage (Horan et al., 2016). However, as far as we are aware, no studies have examined how teacher-child interaction/relationship quality relates to disruptive behavior, academic motivation and engagement of youth high in CU traits.

Quantitative Investigation of CU Traits, Child Adjustment and Teacher-Student Relationship Quality

The aim of this study was to examine the relationship between CU traits, punishment and reward sensitivity and teacher-student relationship quality using a multi-informant, mixed-methods approach. It was predicted that CU traits would be significantly related to poor child adjustment, reduced reward sensitivity, greater punishment insensitivity and poorer quality teacher-student relationships (i.e., greater conflict, less closeness). We also hypothesized that children high in CU traits would demonstrate significantly less responsivity to rewards, greater punishment insensitivity and have poorer quality teacher-student relationships than children low in CU traits.

MATERIALS AND METHODS

Participants

Student Participants

Student participants included 437 children in years 7, 8 and 9 from a state secondary school in the East of England. Of the 503 children approached, 66 declined, giving a participation rate of 87%. Children were aged 11–14 years (51% girls; $M = 12.50$ years, $SD = 0.96$). Most children self-identified as White (85%), with the remainder ($n = 64$) identifying as follows: Black, Mixed Black and White, Asian, or Mixed White and Asian. Most children belonged to an original two-parent family (60%), followed by a step/blended family (21%), with the remainder living in a single parent household (16%), or with extended family (3%). English was an additional language for ~25% of the sample ($n = 99$) and 11% were eligible for free school meals ($n = 46$).

Teacher Participants

Twelve teachers participated, consisting of eight women and four men aged 23–51 years ($M = 35.27$, $SD = 10.43$). Teachers taught English ($n = 5$), Maths ($n = 2$), or Science ($n = 5$), reporting an average of 7.45 years teaching experience ($SD = 5.32$ years; range 1–15 years). All teachers except one identified as White.

Child Selected Sample

Teachers completed an interview for a subset of students randomly selected from those who (i) scored in the top 25% of the student-report total ICU score ($n = 24$) and (ii) who scored below the median on total ICU score ($n = 23$). The aim of this smaller selected sample was to obtain more in-depth information about CU traits in the school context, while ensuring that the assessment protocol did not place an undue burden on teachers. Given the overlap between CU traits and autism in presentation and correlates (Jones et al., 2010), teachers completed an autism

symptom measure for the child selected sample. All children fell below the clinical cut-off for autism and therefore all were included in the analyses.

Measures

Child Background Questionnaire

A brief child-report questionnaire assessed child age, gender, ethnicity, eligibility for free school meals, English as an additional language and family structure.

Teacher Background Questionnaire

This questionnaire assessed teacher report of age, gender, ethnicity and years teaching experience.

Inventory of Callous-Unemotional Traits (ICU; Frick, 2004)

Teacher and child report of callous-unemotional (CU) traits was assessed using the ICU. The ICU consists of 24 items rated on 4-point scale from 0 “not at all true” to 3 “definitely true.” The reliability, validity and factor structure of the teacher and child report versions of the ICU has been supported in adolescent samples (Essau et al., 2006; Roose et al., 2010; Ciucci et al., 2014). The best fitting factor structure is a general callous-unemotional factor and three subfactors: callousness (11 items: e.g., “*I am concerned about the feeling of others,*” unemotional (5 items: “*I express my feelings openly*” and uncaring (8 items: “*I try not to hurt others’ feelings*”). In the current sample, alphas were 0.77 for ICU total scores (student report) and 0.90 for ICU total scores (teacher report).

Social Responsiveness Scale–Brief (SRS-Brief; Moul et al., 2015)

The brief, 16-item version of the SRS was used to assess teacher report of child autism symptoms for the child selected sample. Responses are reported on a 4-point Likert scale (0 = “not true” to 3 = “almost always true”). Moul et al. found that the SRS-brief has good reliability and validity when compared to the original, 60-item SRS (Constantino et al., 2000). Alpha was 0.92 for the SRS-brief total score.

Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997)

The teacher-report version of the SDQ was used to assess child adjustment and prosocial behavior. The SDQ has five scales, comprising five items each: conduct problems, hyperactivity, emotional problems, peer problems and prosocial behavior. Teachers rate the accuracy of statements on a 3-point scale from 0 “not true” to 2 “certainly true.” The SDQ has shown good reliability and validity (Goodman, 2001). Alphas for SDQ scales were 0.57 for emotional symptoms, 0.62 for peer problems, 0.90 for conduct problems, 0.90 for hyperactivity, and 0.93 for prosocial behavior.

Multidimensional Assessment Profile of Disruptive Behavior (MAP-DB; Wakschlag et al., 2010)

The punishment insensitivity scale of the MAP-DB was completed by teachers and children. This 7-item scale is rated on a 6-point Likert scale (0 = “never” to 5 = “all the time”).

The punishment insensitivity scale of the MAP-DB has good reliability and validity (Nichols et al., 2015). Alphas were 0.93 for child and 0.98 for teacher report.

Sensitivity to Punishment and Sensitivity to Reward Questionnaire for Children (SPSRQ-C; Colder and Connor, 2004)

The revised SPSRQ-C was used to assess child report of reward sensitivity. Items are rated on a 5-point scale (1 = “strongly disagree” to 5 = “strongly agree”). Only the reward sensitivity scales were used given that the punishment sensitivity subscale of the SPSRQ-C conceptualizes punishment sensitivity as anxiety symptoms or shy/inhibited traits rather than responses to discipline which forms the focus of the present study. The SPSRQ-C has good reliability and validity (Colder and Connor, 2004; Luman et al., 2012). Alpha was 0.75 for child report of reward sensitivity.

Teacher-Student Relationship Quality

The short form of the Student-Teacher Relationship Scale (STRS; Pianta, 2001) was used to obtain teachers’ views of the quality of the student-teacher relationship. The 15-item STRS consists of two scales assessing teacher-child closeness (7 items) and conflict (8 items). Teachers rate each item on a 5-point scale from 1 “definitely does not apply” to 5 “definitely applies.” The short form of the STRS has good reliability and validity (Rudasill et al., 2010; Drugli et al., 2011). Alphas were 0.85 for closeness and 0.95 for conflict.

PROCEDURE

Permission to approach teachers and students to participate in the study was sought from the school following the receipt of university ethics board approval. All teachers provided informed written consent prior to their participation. Information sheets and opt-out consent forms and reply slips were then mailed to parents of all pupils in years 7, 8, and 9. Parents were given a week to return the reply forms if they did not wish for their child to take part. No reply slips were returned. Parent opt-out consent helps to avoid low response rates and biased samples that are not representative of the community of interest, leading to incomplete and potentially misleading findings. This research aims to examine antisocial behavior and academic motivation in children, so an opt-in sample is likely to have skewed toward fewer children with higher levels of antisocial behavior, social disadvantage and poor academic performance; the very behaviors and characteristics needed to investigate our stated aim and hypotheses. The study took place during regular lesson time in class groups over a 1-week period. The investigator informed pupils that the study focused on the behaviors and attitudes of young people at school toward peers and teachers. Students were given the opportunity to ask questions about the research prior to consenting to participate. Students were informed that their responses were confidential, and that they could leave the questionnaires uncompleted or omit items without giving a reason. Students completed the questionnaires individually under exam conditions and were instructed to raise their

hand if they did not understand any of the items so that the investigator could provide assistance. Following the completion of questionnaires, students were given the opportunity to ask questions about the study.

Once all data was collected from participating students, children with high vs. low levels of CU traits were identified and the second phase of data collection commenced. Teachers completed questionnaires and interviews about children in the selected sample following the receipt of their written informed consent. Teachers completed the assessment protocol for a range from 2 to 10 children ($M = 5.83, SD = 3.01$), depending on how many children in the student selected sample attended their classes. Note that some students were reported on by multiple teachers as if they attended classes taught by more than one teacher who participated in this study, with 70 teacher interviews conducted in total. Teachers completed a brief interview (~5–10 min per student) with the second author during school hours in a private room. The interview comprised set questions concerning their views on the target child's disruptive behavior in school, response to classroom management strategies, academic motivation, teacher-student relationship quality, and how it related to the student's academic progress. Teacher were blind to the child's CU status based on child self-report on the ICU (Frick, 2004). The interviewer was unaware of teacher questionnaire responses when conducting the interviews and was therefore blind to the child's CU status. Teachers were interviewed in the second term of the academic year to allow sufficient time for teachers to observe student behavior and to develop a relationship with their students.

RESULTS

Relationships Between CU Traits, Conduct Problems, Teacher-Student Relationship Quality, Punishment and Reward Sensitivity

Descriptive statistics and correlations for the main study variables are presented in **Table 1** for the whole sample. Teacher and child report were significantly positively related for total ICU scores, and for the Callousness and Uncaring scales. However, there was no significant association between teacher and child report on the Unemotional scale. Teacher and child report of CU traits (ICU total, Callousness, Uncaring, but not Unemotional scale scores) were significantly related to more severe conduct problems. Less teacher-child closeness was significantly associated with teacher report of CU traits (ICU total, Callousness, Uncaring, Unemotional), but not child-reported CU traits. Greater teacher-child conflict was significantly related to teacher total ICU, Callousness and Uncaring, and to child report of ICU total and callousness. Greater teacher-child conflict was related to more severe conduct problems. Teacher report of punishment insensitivity was also significantly associated with teacher-reported ICU total and Callousness, child-reported punishment insensitivity, ICU total, Callousness and Uncaring, less closeness and greater conflict. Child report of punishment insensitivity was also significantly associated with teacher and child report of CU traits (ICU total, Callousness, Uncaring,

TABLE 1 | Descriptive statistics and correlations for CU traits, conduct problems and teacher-student relationship quality.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CHILD REPORT N = 437																
ICU total	23.83	8.04	-	0.75**	0.81**	0.48**	0.59**	0.09	0.48**	0.33*	0.52**	0.31	0.39*	0.41**	-0.25	0.37*
Callousness	7.61	4.16		-	0.38**	0.07	0.62**	0.20**	0.44**	0.38*	0.47**	0.12	0.47**	0.42**	-0.13	0.43**
Uncaring	8.23	4.41			-	0.19**	0.47**	0.07	0.41*	0.21	0.47**	0.38*	0.28	0.34*	-0.25	0.27
Unemotional	7.98	2.75				-	0.02	-0.14	0.31	0.22	0.30	0.30	0.17	0.21	-0.28	0.15
Punishment insensitivity	14.54	6.55					-	0.38**	0.64**	0.57**	0.65**	0.18	0.63**	0.73**	-0.27	0.61**
Reward Sensitivity	53.48	9.34						-	0.25	0.34*	0.20	-0.09	0.28	0.25	0.04	0.31
TEACHER REPORT N = 47																
ICU total	25.76	15.12							-	0.90**	0.93**	0.47**	0.87**	0.84**	-0.58**	0.84**
Callousness	7.47	7.82								-	0.73**	0.17	0.92**	0.84**	-0.35*	0.90**
Uncaring	12.32	7.25									-	0.40*	0.76**	0.75**	-0.56**	0.73**
Unemotional	5.97	7.86										-	0.17	0.23	-0.71**	0.12
Punishment insensitivity	12.63	9.33											-	0.86**	-0.36*	0.92**
Conduct Problems	1.74	2.76												-	-0.28	0.91**
Closeness	24.08	6.23													-	-0.24
Conflict	15.44	7.83														-

ICU, Inventory of Callous-Unemotional Traits; CP, conduct problems. * $p < 0.05$. ** $p < 0.01$. Two-tailed.

TABLE 2 | Demographic and adjustment data for children high vs. low in self-reported CU traits.

	Low CU n = 23	High CU n = 24	Statistic χ^2/F	p
% Male gender	52.2	45.8	0.189	0.773
% English first language	72.7	82.6	0.635	0.491
% Child minority ethnicity	21.7	16.7	0.195	0.724
% Eligible for free school meals	9.1	26.1	2.222	0.243
% Single-parent family	13.0	21.7	0.605	0.699
% Parent \leq 16 years education	13.3	40.0	2.727	0.215
Child age: Mean (SD)	12.39 (0.94)	12.58 (1.06)	0.691	0.421
Conduct problems	0.63 (1.54)	2.70 (3.29)	5.378	0.027
Emotional problems	0.94 (1.39)	1.50 (1.47)	1.367	0.250
Hyperactivity	1.69 (2.02)	4.05 (3.55)	5.615	0.024
Peer problems	1.13 (1.26)	2.60 (2.16)	5.842	0.021
Prosocial behavior	1.50 (0.61)	0.76 (0.62)	12.801	0.001
Autism symptoms	1.44 (2.66)	6.60 (7.51)	6.833	0.013
ICU total score (teacher)	17.44 (13.26)	32.35 (14.23)	10.371	0.003
Punishment Insensitivity (child)	11.88 (5.07)	21.75(9.55)	13.918	0.001
Punishment Insensitivity (teacher)	8.88 (4.44)	15.95 (11.35)	5.516	0.025
Reward Sensitivity (child)	53.95 (8.98)	50.70	1.056	0.311
Closeness	25.63 (7.46)	22.30 (4.62)	2.690	0.110
Conflict	12.75 (4.95)	18.15 (9.32)	4.368	0.044

ICU, Inventory of Callous-Unemotional Traits; Two-tailed.

Unemotional), conduct problems and teacher-child conflict. Reward sensitivity was significantly related to Callousness. No other associations between main study variables were significant.

Group Differences in Sociodemographic Characteristics, Child Adjustment, Teacher-Student Relationship Quality and Punishment and Reward Sensitivity

Children high and low in self-reported CU traits were compared on sociodemographic measures using chi-square analysis and on adjustment variables using two-tailed between-subjects analysis of variance (ANOVA). Descriptives and findings for the high and low CU group comparisons are presented in **Table 2**. Exploratory data analysis on the high and low CU groups revealed that assumptions for normality were violated for several variables. Therefore, non-linear regression using bootstrapping at 1,000 resamples (Field, 2013) was used in the group comparisons on child adjustment variables and teacher-student relationship quality to ensure that relationships were statistically robust. Groups did not differ significantly for any sociodemographic variables. Two-tailed between-subjects analysis of variance (ANOVA) revealed that teachers reported significantly poorer adjustment for high CU children compared to low CU children on all measures except for emotional problems (**Table 2**). There was no significant group differences in teacher-reported closeness or child-reported reward sensitivity. However, significantly greater teacher-child conflict and punishment insensitivity was evident for high CU traits compared to low CU children.

A Check on Potential Confounds to the Relationship Between CU Traits and Teacher-Student Conflict

Partial correlations were used to check for potential confounds to the significant association between teacher report of CU traits and teacher-student conflict. These included child age, minority ethnicity status, gender, child adjustment variables, punishment and reward sensitivity. The relationship between CU traits and teacher-student conflict remained significant when controlling for these potentially confounding variables, with the exception of teacher report of punishment sensitivity (**Table 3**).

Qualitative Investigation of Teacher Perspectives

The aim of the qualitative component of this study was to obtain teacher perspectives on students high vs. low in CU traits in terms of disruptive behavior, responses to classroom management strategies, academic motivation, the quality of the teacher-student relationship and how this relates to student academic engagement, progress and behavior. A qualitative approach is particularly useful for this topic given that research CU traits in the school setting is at a very early stage—thus our study findings have the potential to increase our understanding of teacher-student relationship processes and complex contextual factors relating to the disruptive behavior, academic engagement and motivation of high CU children in school.

We aim to answer the following research questions:

1. How do CU traits present in the school setting from a teacher perspective?

TABLE 3 | Partial correlations between CU Traits and Teacher-Child Conflict, Controlling for Potential Confounds.

	Controlled variable	Partial correlations
Teacher-child conflict	Child age	0.85***
	Child gender	0.78***
	Child minority ethnicity	0.84***
	Conduct problems	0.38*
	Emotional problems	0.84***
	Peer problems	0.81***
	Hyperactivity	0.61***
	Autism	0.77***
	Punishment insensitivity (child)	0.75***
	Punishment insensitivity (teacher)	0.23
	Reward sensitivity (child)	0.84***

Covariates: Callous-unemotional (CU) traits and teacher-child conflict. * $p < 0.05$. *** $p < 0.001$. Two-tailed.

- How do the disruptive behaviors of children high in CU traits vary to those shown by children low in CU traits in type, frequency and severity?
- How do students with high levels of CU traits respond to teacher reward and discipline strategies compared to students low in CU traits?
- How does the quality of the teacher-student relationship differ for students with high vs. low levels of CU traits, and how does it relate to their behavior?
- What are teachers' views on the academic motivation of children high vs. low in CU traits, and how does the quality of the teacher-student relationship relate to child academic motivation?

Data Collection

Semi-structured interviews were conducted with teachers following the completion of questionnaires to obtain their views on student disruptive behavior, response to classroom management strategies, academic motivation, the quality of the teacher-student relationship and how it relates to academic progress of students who high versus low in CU traits (see Appendix for interview questions).

Data Analysis

All interviews were audio-recorded and transcribed verbatim by the interviewer (second author) and the last author. Interviews were analyzed using deductive thematic analysis in NVivo 12, following the process and recommendations outlined by Braun and Clarke (2006). The identification of themes was guided by theory and research on student responses to classroom management strategies, teacher-student relationship quality, motivation and their relationship to both academic and behavioral outcomes. This extended to the literature on CU traits and parent-child interaction/relationships given the limited available research on this topic in the school context. Engagement with relevant literature prior to coding is viewed as a means of sensitizing coders to more subtle features of interview data

(Tuckett, 2005). Themes were identified and coded by the first and second authors (JA and EB) on the basis of their importance in relation to the research questions and potential theoretical interest rather than their prevalence within each interview or even across the entire data set. Coding was based on information gathered from the interviews as a whole rather than restricted to answers to a specific question. Codes were also generated when data included inconsistencies across and within interviews or were at odds with the literature, to ensure that data of theoretical relevance that departed from the dominant story were not overlooked. To ensure reliability a randomly selected 20% of interviews were coded independently by the third author (CC) using the coding scheme developed by the first and second authors. No additional codes or themes were identified through this process. There was good agreement between coders ($\kappa = 0.92$). Any disagreements were resolved through discussion. Interviews were coded prior to analysis of quantitative data in order to ensure that all coders were blind to the child's self-reported CU status. Once coding was completed, blinding was removed to enable the analysis of similarities and differences between teachers' accounts for students high vs. low in CU traits. **Tables 4, 5** shows themes, sub-themes and accompanying examples for students low and high in CU traits.

Callous-Unemotional (CU) Traits and Disruptive Behavior in School

Teachers recounted examples of behaviors that fit with the conceptualization of CU traits, including interpersonal callousness and lack of guilt:

"He doesn't feel guilty for anything that he does. He takes no responsibility for his behaviour. And he in fact puts that responsibility on other people, so as in 'I haven't done anything wrong, you're just doing it to me. It's your fault, it's nothing to do with me'. So lack of guilt definitely with him."

"He doesn't seem to be very threatened by anything, he's not afraid. If he's called out on anything, he's not bothered by it and doesn't react to other children's aggression."

Another theme that was developed related to emotionality, and appeared to contradict the "unemotional" aspect of CU traits:

"She is less reactive to any situation, but she does get emotional. I can see her get very angry sometimes, I can see it, but she doesn't do anything, she holds it all in."

"He likes new and dangerous things. Does have emotions, he shows emotions quite a lot."

"I think she's emotional, definitely got the emotions there. She's not unemotional. And she would probably go for exciting activities just because there might be boys there."

Thus students high in CU traits were reported to display negative emotions, particularly anger. In addition to displays of positive emotions when engaging in dangerous and thrill-seeking activities, teachers also reported enjoyment of others' distress:

TABLE 4 | Qualitative findings for CU traits, disruptive behavior, response to rewards and discipline, academic motivation, and teacher-student relationship quality in low CU students.

Theme	Sub-theme	Description
Disruptive behavior	None or 'low level'	None reported or only behaviors that are low in severity and frequency, e.g., chatting
	Overt disruptive behavior in class	Shouting, frequent talking, refusal to work, throwing things, using a mobile phone, "aggravating others" by e.g., pulling hair, poking
Positive Response to Discipline		Accepts discipline, shown by apologizing, ceasing misbehavior and/or resuming school work
Negative emotional or behavioral responses to discipline	Self-referential negative emotion	Guilt, disappointment in oneself, shame or embarrassment in response to discipline or limit-setting
	Negative emotional responses	Being "defensive," "taking it personally," crying
No response to rewards		Not driven or encouraged by rewards
Response to rewards	Social Rewards	Positive response to social rewards, e.g., praise
	Tangible rewards	Motivated by tangible rewards e.g., school points system, sweets
Academic motivation	High intrinsic motivation	Poor motivation and lack of engagement attributed to a lack of intrinsic motivation
		Good quality teacher-student relationship important contributor to academic motivation
		May be highly motivated despite low ability
Quality of TSR	Good quality TSR	TSR described as "good" or "positive"; characterized by student confiding and help-seeking when appropriate, trust, respect, understanding and enjoyment of interactions with the teacher
	Mixed quality TSR	TSR described as possessing both negative and positive features.
	Academic motivation	Negative impact of poor quality TSR on academic motivation and engagement

CU traits, callous-unemotional traits; TSR, teacher-student relationship.

"It's her picking her moments and picking what she says to somebody to get a reaction out of them because she finds some sort of joy in doing it."

"He is very competitive, he likes to get the top marks, and will cheat to win"

"I think she finds it funny to see this girl kind of lose her temper... and she can't technically get in trouble for it because she's not the one who's reacting."

We also examined teacher perspectives on disruptive behaviors shown by students high vs. low in CU traits. For low CU children, teachers often reported that the child was "rarely" or "never" disruptive. When disruptive behavior did occur, it was described as "low level" (e.g., infrequent chatting):

"It is just the odd time where there is a bit of chat, but like I said once you say to her, 'stay on task', she'll generally come back."

All types of reported overt and covert disruptive behaviors were more frequent and severe for high CU students, often exerting a negative impact on classroom functioning:

"He has done anything and everything to be disruptive. He is disruptive to other people, and he doesn't care how much he destroys the lesson."

CU Traits and Response to Teacher Discipline Strategies

Teachers reported not needing to discipline several well-behaved children, thus themes relating to response to discipline were "not applicable" for these students ($n = 9$ low CU group, $n = 3$ high CU group). One theme identified referred to positive responses to discipline, with teachers reporting that some children accepted their attempts to set limits, often ceasing misbehavior, apologizing and resuming their school work:

"He's fine... he'll just sort of say, 'I'm really sorry, Miss', and then get on with it."

Furthermore, teachers viewed detentions as having a detrimental effect on the academic performance of high CU students:

"He's missing one lesson a week at the moment which is having a huge effect on his academic progress."

Surprisingly, this response was evenly distributed among students in the high and low CU groups.

Few covert disruptive behaviors were reported for the sample as a whole, but those that were referred to students in the high CU group:

We then identified themes relating to responses that are reflective of self-referential negative emotions associated with optimal development of conscience (e.g., embarrassment, guilt, disappointment), and negative responses associated with poor conscience development (e.g., anger, "sulking," arguing back, lack of remorse or uncaring responses). Self-referential emotions were predominantly reported for students low in CU traits, for example:

TABLE 5 | Qualitative findings for CU traits, disruptive behavior, response to rewards and discipline, academic motivation, and teacher-student relationship quality in high CU students.

Theme	Sub-theme	Description
Psychopathic traits	Interpersonal callousness	Lack of concern for the impact of their behavior on others
	Lack of guilt	Does not show guilt or remorse for misbehavior Blames others for misbehavior
Disruptive behaviour	Emotionality	Intense displays of anger in response to discipline Enjoyment of others' distress Enjoyment of novel and dangerous activities
	Covert disruptive behavior in class	Cheating Social manipulation
	Overt disruptive behavior in class	Shouting, frequent talking, refusal to work, throwing things, using a mobile phone, "aggravating others" by e.g., pulling hair, poking
Positive Response to Discipline		Accepts discipline, shown by apologizing, ceasing misbehavior and/or resuming school work
Negative responses to discipline	Negative emotional responses	Sulking, being "defensive," "taking it personally," crying
	Uncaring response	Described as uncaring, unreactive or "not threatened" in response to discipline
	Aggressive or confrontational responses	Intense displays of anger in response to discipline Arguing with the teacher or "back-answering" Refusal to comply with discipline
No response to rewards		Not driven or encouraged by rewards
Response to rewards	Social Rewards	Less responsive to social rewards, e.g., praise
	Tangible rewards	Motivated by tangible rewards e.g., school points system, sweets
Academic motivation	Low intrinsic motivation	Poor motivation and lack of engagement attributed to a lack of intrinsic motivation Good quality teacher-student relationship important contributor to academic motivation Low motivation despite possessing the ability to do well
	Needs to be "pushed"	Intense, frequent monitoring and encouragement needed for student to engage in school work
Quality of TSR	Good quality TSR but recognize student 'difficult' for other staff	TSR described as "good" or "positive"; characterized by student confiding and help-seeking when appropriate, trust, respect, understanding and enjoyment of interactions with the teacher
	Poor quality TSR	TSR described as "poor," "bad," or "not good"; characterized by student disrespect toward the teacher, student dislike of the teacher and conflict
	Mixed quality TSR	TSR described as possessing the negative and positive features described in the above two categories
	Academic motivation	Negative impact of poor quality TSR on academic motivation and engagement

CU traits, callous-unemotional traits; TSR, teacher-student relationship.

"Embarrassed... he'll be like 'I'm really sorry' and he'll go red."

In contrast, negative emotional responses associated with poor conscience development were frequent for students who self-reported as high in CU traits:

"Badly. He can become very, very defensive. If you do reprimand him for something, it's generally a 'I wasn't even doing anything' or 'This or other person is doing it'."

"Every lesson she'll be asked to stop talking and she'll answer back, and that's the problem. She'll argue back and be very vocal about being told off."

Two subthemes were identified within the broader theme of negative responses to discipline for the high CU group: (i) uncaring responses and (ii) aggressive or confrontational responses. Slightly more high CU students were reported as uncaring in response to discipline:

"When he gets in trouble he doesn't seem to care... he doesn't seem to show a lot of remorse or empathy. There have been times when he's acted out and apologized but not usually he normally laughs it off"

and the following somewhat contradictory statement:

"He doesn't respond, it is water off a ducks' back, he doesn't care. I If I have to send him out, he will go kicking and screaming."

A theme that commonly applied to students in the high CU group was an aggressive or confrontational response to discipline. This brings us to the earlier theme of emotionality in high CU students. Examples belonging to this theme appeared predominantly in response to probes about student disruptive behavior and response to discipline.

"Things like sanctions, he'll hit the roof, 'I didn't do anything! I didn't do it!'... Yeah, he's emotional. It can be a real mix when you

discipline him between, ‘Yes, miss, really sorry, miss’, being that kind of contrite student that we get. Or it can be quite aggressive or quite, you know, ‘No, didn’t do that’ and gets quite affronted when you say to him ‘Look you need to take time outside to calm down’.”

CU Traits and Response to Teacher Reward Strategies

Two main themes were identified in relation to rewards: (i) no response to reward, and (ii) positive responses to rewards, further subdivided into positive responses to social vs. tangible rewards. Teachers reported little or no response to reward for a similar number of low and high CU students:

“It doesn’t make much difference to him at all, rewards don’t drive him. I just think he doesn’t care.”

“Doesn’t affect her at all really, to be honest. She’s very insular, she’s very in herself. Nothing outside of her seems to affect anything, so rewards don’t seem to work with her at all.”

Teachers viewed most children as responsive to rewards regardless of CU status, and expressed the benefits of rewards for promoting prosocial behavior, confidence, motivation and a positive teacher-student relationship:

“Confidence is key with her, when she is patted on the back with a ‘well done’ it brings her out of her shell and she gets more involved.”

“I give her a lot of praise as I know she can be difficult, and I think she likes that.”

The theme of positive responses to tangible rewards applied equally to high and low CU groups. In contrast, teachers were more likely to view low CU students as more responsive to social rewards than high CU students, with praise the most frequent form of social reward mentioned.

Callous-Unemotional (CU) Traits and Academic Motivation

Teachers primarily attributed positive engagement in school work to students’ intrinsic motivation rather than external factors (e.g., enjoyment of the subject, positive family or teacher influence), with more low CU students identified as self-motivated than the high CU group. Teachers viewed a good quality teacher-student relationship as an important contributor to academic motivation regardless of CU status:

“If a student trusts you and they know how you’re going to react and there’s a good relationship there, I think that has a positive impact on how they will behave towards you and your subject and your work. And they often want to please, they want to do well, because they want to show you what they can do and he’s one of those.”

One theme that was prominent for children with high CU traits was the need to be “pushed,” with these students appearing to lack intrinsic motivation despite possessing the ability to do well:

“He is cleverer than he thinks....he is one that you need to keep pushing.”

“She does have ability, but will just coast along and not push herself.”

Teachers also recognized the impact of low motivation and lack of response to teacher encouragement on the academic achievement of high CU students:

“I think he is bright, but he is not performing as he should, it doesn’t seem to matter what you do with him”.

Callous-Unemotional (CU) Traits and Teacher-Student Relationship Quality

Most teachers reported positive relationships with low CU students, with a small minority reporting their relationship with a low CU student as “mixed” in that it featured both positive and negative aspects. No teachers described their relationship with a low CU student as negative (i.e., relationships characterized by dislike, conflict and disrespect). In contrast, several teachers described their relationship with students in the high CU group in negative terms:

“I’d say it’s not good, he doesn’t like the fact that I will keep on at him to settle down and get on with his work.”

“I wouldn’t say that he likes me, he isn’t the most respectful of students.”

Some teachers also noted the impact of a poor TSR on the academic engagement of high CU students:

“He isn’t academic either and does not care.... It may be the subject, it may be a bad relationship between him and I.”

Surprisingly, teachers tended to describe their relationship with most high CU students in positive terms. However, closer examination indicated that these teachers recognized the need to be firm with high CU students even when a good relationship was present:

“Quite good.... But there are times when he just pushes the boundaries and I have to be really strict which I don’t like.”

“She has bad anger issues, but in these classes, she will accept that she is not allowed to show these, and her behaviour will not be excused.”

Furthermore, it was noted by several teachers that these children behaved differently for other teachers:

“I think because she likes me I don’t have to send her out the class.”

“I think it does matter with him, because ... I have seen him in other lessons just sit there and not want to take part in anything

at all. And you can tell that there is a frosty relationship between him and some of his teachers.”

DISCUSSION

In support of our hypothesis, there were significant relationships between CU traits and more severe conduct problems, hyperactivity and autism symptoms. This is consistent with the previous evidence for an association between CU traits and a broad range of emotional and behavioral difficulties (Jones et al., 2010; Ciucci et al., 2014). Thematic analysis of teacher interviews also highlighted a greater variety and severity of overt and covert disruptive behaviors along with the pursuit of novel, dangerous activities as characteristic of high CU students, consistent with past research and the conceptualization of psychopathic traits in youth (see Frick et al., 2014a). Teachers also emphasized the callous disregard and lack of remorse shown by high CU students for the impact of their disruptive behavior on others in the classroom. This is consistent with evidence for the negative impact of disruptive behavior on classmates and classroom functioning (Herrero et al., 2006; Thomas et al., 2011); and highlights the importance of CU traits as a target for school-based intervention. One teacher identified frequent removal from class as a contributor to the poor academic performance of high CU students. While this discipline strategy is one of very few viewed as effective by teachers for high CU students, its potential impact on school performance was also raised as a concern by teachers in previous qualitative research (Allen et al., 2016). Antisocial behavior and the resultant discipline and exclusionary procedures employed to manage them in school have shown to damaging effects, including increased grade failure, school dropout, poor academic achievement and involvement in the juvenile justice system (Malecki and Elliot, 2002; Dishion and Dodge, 2005; Department for Education, 2010). Therefore, a promising line of enquiry for future research is to investigate the impact of different forms of disciplinary measures on the academic achievement and attainment of antisocial students with CU traits.

Consistent with our predictions and past research (Ciucci et al., 2014; Allen et al., 2016), students high in CU traits showed greater punishment insensitivity and reduced reward sensitivity. Consistent with developmental theory and past research (Kochanska, 1994; Blair, 1995), teachers reported that high CU students were more likely to display uncaring responses to discipline and less likely to display negative emotion related to conscience, such as shame, guilt and disappointment in oneself. This lack of uncomfortable emotional experience in response to transgression is believed to lead to increased CU traits and antisocial behavior (Kochanska, 1994), and may prevent children high in CU traits from trying to seek forgiveness and repair their relationships with others (Warren et al., 2015). Present study results suggest that the findings of the literature on parental discipline concerning the role of punishment insensitivity in the development of antisocial behavior and CU traits (e.g., Wootton et al., 1997; Oxford et al., 2003) may also be applicable to teacher-child interaction, a topic which warrants further examination utilizing a longitudinal design.

Our hypothesis that students high in CU traits would show reduced reward sensitivity was supported by our quantitative and qualitative findings, consistent with past research (Marini and Stickle, 2010; Centifanti and Modecki, 2013; Allen et al., 2016). However, we used the SPSRQ-C reward sensitivity scale encompasses a range of different types of rewards, including praise and social approval, tangible rewards impulsive fun-seeking, and competitive drive. Our qualitative interviews suggested that the reduced sensitivity was most evident for social reward (e.g., teacher praise), with tangible rewards viewed as effective for students high and low in CU traits. This contrasts with past research showing links between CU traits and increased responsiveness to tangible rewards (Pardini et al., 2003; Lorber et al., 2011). The school in the current study utilized a points system which could be traded in for purchases at retail stores—a system that was identified as extremely popular by teachers. It is possible that the high desirability of this reward produced a ceiling effect, preventing the identification of differences for students high vs. low in CU traits. However, a recent review by Byrd et al. (2014) concluded that children high in CU do not show impaired reward processing when examined in isolation from punishment. Furthermore, most research on reward dominance has employed competitive, computer-based experimental paradigms, and as such these findings lack ecological validity. Thus, tangible rewards may either not be differentially reinforcing for high vs. low CU children, or their motivating value may be limited to competitive contexts which enable high CU children to obtain social status or social dominance (e.g., Pardini and Byrd, 2012). Future research should employ assessment methods that differentiate between tangible and social rewards and investigate the potential influence of the differing contexts in which rewards are received, such as in the presence or absence of peers (e.g., Centifanti and Modecki, 2013).

One unexpected theme that was identified related to the expression of emotions for high CU students. By definition, CU traits are viewed as characterized by a reduced capacity for emotional experience, and therefore emotional expressivity and responsiveness. However, in the present study, teachers provided numerous examples of when students high in CU traits displayed intense positive and negative emotions. The main contexts that elicited positive emotional expression were joy or happiness in causing distress to others, and when in the pursuit of novel, dangerous thrill-seeking activities. The presence of positive emotions during risk-taking is consistent with trait models of aggression emphasizing sensation-seeking, surgency/extraversion and behavioral approach, with increasing evidence for the importance of positive emotions in driving and reinforcing both proactive and reactive aggression (Chester, 2017). In the adult literature, a relationship has been noted between psychopathic traits and feelings of contempt for others, with this “contemptuous delight” feeding into a sadistic tendency to derive pleasure from demeaning and hurtful interactions (Foulkes et al., 2014). Our findings suggest that this phenomenon may also be present in youth high in CU traits. Finally, teacher interviews revealed that discipline or limit setting often elicited displays of anger from high CU students, namely verbal aggression - consistent with past qualitative findings (Allen et al.,

2016). There are several different possible explanations for this. First of all, models of the development of CU traits highlight impairments in fear, sadness and more recently, happiness rather than anger (Frick and Morris, 2004; Blair, 2005). It has been suggested that psychopathic traits may be related to lower levels of self-directed negative emotions related to the experience of personal distress (e.g., fear, sadness) or the development of conscience (e.g., shame, guilt), but to higher levels of other-directed negative emotions such as anger, contempt or spitefulness (Benning, 2013; Garafolo et al., 2018). Indeed, research in adults has shown links between psychopathic traits and greater levels of anger (Jackson et al., 2007; Hoppenbrouwers et al., 2016). Another possibility is that the anger was “fake” rather than “felt,” with the display of anger used as a means to intimidate others and reduce the likelihood of punishment being initiated or enacted, consistent with the limited prosocial emotions specifier (American Psychiatric Association, 2013). Another alternative is that the display of anger may be driven by narcissism rather than CU traits, as a threat to self-esteem such as discipline from an authority figure is consistent with recognized triggers for “narcissistic rage” (Krizan and Johar, 2015). Future research examining emotional responses to discipline should include a measure of narcissism to test this possibility.

In partial support of our predictions, CU traits were related to greater teacher-child conflict and less closeness, consistent with past research in elementary schools (Crum et al., 2016; Horan et al., 2016). However, group comparisons did not reach significance with teachers reporting significantly more conflict, but not less closeness in their relationships with high-CU compared to low-CU students. This is most likely due to a lack of power due to our relatively small sample for quantitative analysis ($N = 47$), although teacher-child conflict typically shows stronger links with externalizing behaviors than low closeness (Myers and Pianta, 2008). It should be noted that the high and low CU groups were formed on the basis of student report. The nonsignificant group difference for closeness may therefore be attributable to teachers' lack of agreement with student perception of self-reported CU traits. CU traits may occur in the absence of antisocial behavior (Rutter, 2012), and teachers tended to report closer relationships with students they viewed as displaying no or low-level disruptive behavior. Therefore, present findings for CU traits and low closeness may be due to the absence of perceived comorbid behavior problems. These possibilities could be teased apart using a quantitative study including both teacher and student report of CU traits, the teacher-student relationship and conduct problems.

The association between CU traits and greater teacher-child conflict appears to be quite robust, remaining after controlling for child sociodemographic characteristics, reward sensitivity and behavioral adjustment. Interestingly, the association disappeared when accounting for teacher, but not child report of punishment insensitivity. It may be that the perceived punishment insensitivity characteristic of students with CU traits that teachers find most aggravating, and therefore the greatest source of conflict. Encouragingly, qualitative analysis revealed that while more teacher identified poor relationships for high CU students, most teachers described their relationship in positive

terms. As indicated in our qualitative findings, teacher-student relationships are multifaceted and complex, and it is therefore possible to view a relationship as positive overall despite the presence of conflict.

Teachers viewed high CU students as low in intrinsic motivation for school work despite possessing the ability to do well. This is consistent with the view that youth with CU traits perform poorly at school because their callous and uncaring interpersonal style extends to school performance, with poor academic outcomes reflecting low intrinsic motivation despite possessing a similar IQ to their same-age peers (DeLisi et al., 2011). Consistent with this view, teachers reported the need for intense, regular monitoring and feedback to encourage high CU students to engage with school work. Qualitative findings revealed that a poor-quality relationship was viewed by teachers as having a negative impact on the academic motivation and engagement of high CU students, while a good quality relationship was identified as an important contributor to academic motivation, irrespective of the presence of CU traits. Thus, qualitative findings suggest that investigation of the interrelationships between CU traits and intrinsic and extrinsic forms of motivation are a fruitful avenue for identifying risk and protective factors for poor academic outcomes in high-CU children.

This study possesses several limitations which should be acknowledged. First, the sample consisted of non-referred White middle-class students attending a secondary school in the United Kingdom. It is not clear whether our quantitative findings would generalize to children of minority ethnicity, those living in disadvantaged neighborhoods or who meet criteria for an externalizing disorder. However, qualitative research differs from quantitative in that the focus is on capturing the diversity of participant experience rather than the generalizability of findings. The sample size for the quantitative analyses for the high and low CU groups was small, with different teachers reporting on different students. Another issue to bear in mind is that children were classified as high or low in CU traits on the basis of student self-report. Thus, it is important to interpret current findings as reflecting teacher perspectives on students who self-identified as high in CU traits. The present study would be enhanced by including both student and teacher perspectives, particularly as research on CU traits and teacher-child interaction to date has predominantly relied on teacher questionnaire report (e.g., Crum et al., 2016; Horan et al., 2016). This study employed a cross-sectional design, preventing any conclusions about the direction of relationships between main study variables. Future research employing a longitudinal design could examine potential reciprocal relationships between CU traits, disruptive behavior teacher-student interaction/relationship quality and academic motivation. Finally, we relied on questionnaire and interviews, assessment methods which are open to biases relating to mood, memory and personality. However, the methods employed in the present study have been useful in highlighting areas that warrant greater research attention using more resource-intensive methods such as classroom observation that enable a more objective assessment of teacher-student interaction.

This study also possesses considerable strengths, as it is one of few studies examine the presentation, impact and correlates of CU traits in school, and one of even fewer studies to employ a mixed methods design. Given that very little is known about CU traits in the school context, our qualitative findings provide important leads on the relationships between teacher-student relationship quality, intrinsic motivation and the responsiveness of high CU students to classroom discipline and reward-based strategies—all factors that have been identified as potential mediators of the relationship between CU traits and poor behavioral and academic adjustment (e.g., DeLisi et al., 2011; Ciucci et al., 2014; Horan et al., 2016), as well as providing a richer, deeper account of emotional responding to teacher rewards and discipline. This study improves on previous mixed methods research on response to teacher rewards and discipline in students high and low in CU traits (Allen et al., 2016) by using a larger sample of male and female students and interviewing teachers about specific students rather than responding to a generic description of a child with CU traits, enabling teacher report to be linked to child outcomes. Finally, our selection strategy ensured that there was no bias related to teacher perceptions in terms of the student sample randomly selected for the teacher assessment protocol.

Our qualitative findings are consistent with the view that risk pathways for poor academic outcomes may differ for antisocial youth high and low in CU traits, such that antisocial youth low in CU traits perform poorly due to deficits in verbal ability, and high CU youth perform poorly due to low intrinsic motivation (DeLisi et al., 2011). As such, current study findings suggest that school-based interventions aimed at promoting academic performance by targeting verbal ability are unlikely to be effective with high

CU students. Consistent with previous research (Allen et al., 2016), current results suggest that teachers are likely to need extra support to implement discipline and reward-based strategies effectively. Consistent with past research on interpersonal relationships in schools (e.g., Crum et al., 2016; Horan et al., 2016; Thornberg and Jungert, 2017), our findings suggest that developing positive relationships between teachers and students may be more likely to be beneficial for promoting prosocial behavior, academic motivation and school engagement in this high-risk group of antisocial children. Future research could examine whether interventions focused on promoting positive teacher-student interactions and relationships are beneficial for antisocial students high in CU traits across social, behavioral, motivational and academic domains.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of the UCL Institute of Education ethics board. The protocol was approved by the UCL Institute of Education ethics board. All subjects gave written informed consent in accordance with British Psychological Society guidelines and the Declaration of Helsinki.

AUTHOR CONTRIBUTIONS

EB collected the data and conceived of this study under the supervision of JA for her Masters' dissertation. JA drafted the manuscript. JA, EB, and CC conducted and wrote the qualitative analysis. All authors provided critical input for intellectual content, contributed to manuscript revisions, and read and approved the submitted version.

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APPENDIX

Interview Questions

1. What types of reward techniques do you use in your classes? 2. What types of discipline techniques do you use?

The following questions are administered for each target child identified as attending the teachers' classes:

The following questions are about [target child].

1. How does [target child's name] respond when you have disciplined them? [skip following prompt if teacher reports never any need for discipline]
 - i) Why do you think s/he responded this way?
2. How does [target child's name] respond when you reward them?
 - i) Why do you think s/he responded this way?
3. How often is [target child] disruptive?

[administer the following items if the teacher reports disruptive behavior, otherwise skip to question 5]
4. Tell me about when [target child] is disruptive in school.
 - i) What disruptive behaviors does [target child] show?
 - ii) and in what circumstances?
5. What do you think are the reasons for [target child's] disruptive behavior? Repeat each example provided by the teacher and clarify their views on the motivation underlying the child's behavior].
6. Tell me about [target child]'s motivation for school work. {if no/little information provided, administer following prompts: do you find that [target child] tries to make an effort with their work? do they show these behaviors often, do they try to work on their own or do they need reminding?}
7. How would you describe your relationship with [target child]?
8. What are your views on how [target child's] behaviors and attitudes toward you influences her/his academic progress?