Callous-Unemotional (CU) Traits in Adolescent Boys and Response to Teacher Reward and Discipline Strategies

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Abstract

The aim of this study was to investigate the relationship between callous-unemotional (CU) traits and response to rewards and discipline in adolescent boys using a mixed methods approach. Participants comprised 39 boys aged between 12 and 13 years and eight teachers. Quantitative findings showed that CU traits were significantly related to punishment insensitivity, controlling for conduct problems, autism symptoms and hyperactivity. In contrast, there was no significant association between CU traits and reward sensitivity. Qualitative analysis indicated that teachers view children high in CU traits as responsive to fewer reward and discipline strategies, and strategies need to be implemented and monitored with care to avoid unintended, undesirable outcomes. However, time-out, praise, support from other staff and maintaining a positive teacher-child relationship were identified as effective strategies. Findings emphasise the need to carefully select, modify and implement existing evidence-based classroom behaviour management strategies with high CU children.

Keywords: callous-unemotional traits; reward; discipline; punishment; teacher-child interaction

Introduction

Antisocial behaviour is a major problem in schools, due to its considerable negative impact on students, peers and teachers. Conduct problems (CP) are common in childhood, and are associated with teacher stress, poor teacher-child relationships and disturbed classroom functioning (Friedman-Krauss, Raver, Morris, and Jones 2014; Spilt, Koomen, and Thijs 2011). Antisocial behaviour is predictive of school dropout, truancy, exclusion and poor academic outcomes (Parker, Rubin, Price and Deroiser 1995), and places children at risk for peer rejection and affiliation with an antisocial peer group (Coie and Dodge 1998). Poor long-term outcomes include unemployment, relationship instability and involvement in the criminal justice system (Loeber, Burke, Lahey, Winters, and Zera 2000). Antisocial behaviour also places a huge burden on health, social and legal services, with the education system bearing the brunt of the financial cost (Snell et al. 2013).

Children with conduct problems can be subtyped on the basis of the presence of callous-unemotional (CU) traits, a temperament dimension characterised by low empathy, lack of guilt about misbehaviour, indifference about performance and shallow affect (Frick et al. 2013). CU traits have a genetic basis and are associated with a greater severity, variety and stability of antisocial behaviour (Salekin 2008; Viding, Blair, Moffitt and Plomin 2005). Children with CU traits show deficits in recognizing and responding to emotional cues, particularly those indicating others' distress (Blair et al., 2005; Muñoz 2009). They possess a particularly malicious social schema, placing a high priority on social dominance, revenge and forced respect; focusing on the benefits of aggression with little concern for victim suffering (Pardini, 2011; Pardini and Byrd, 2012; Pardini, Lochman, and Frick, 2003). The recent edition of the *Diagnostic and Statistical Manual of Mental Disorders* [*(DSM-5*; American Psychiatric Association, 2013)] included CU traits as a specifier to Conduct Disorder for those who present with 'limited prosocial emotions', such as low empathy and

guilt in recognition of the distinct characteristics, correlates and poor outcomes for children high in CU traits relative to other antisocial children.

CU traits have also been linked to deficits in processing rewards and punishment (see Byrd, Loeber, and Pardini 2014 for a review). Blair (1995) argued that children high on CU traits fail to process others' distress cues (e.g., sadness, fear), resulting in impaired associative learning. That is, if no conditioned association is formed between misbehaviour and the emotional consequences of discipline (e.g., anxiety, guilt), there is an increased likelihood of misbehaviour re-occurring (Dadds and Salmon 2003). CU traits have also been linked to a 'reward-dominant' behavioural style, where adolescents persist in pursuing a goal when a reward is primed, even at the risk of negative consequences for themselves or others (Fisher and Blair 1998; O'Brien and Frick 1996). However, studies have also found that CU traits are related to diminished reward sensitivity (e.g., Centifani and Modecki, 2013; Marini and Stickle 2010). Inconsistent findings are difficult to interpret, given differences in sample characteristics, assessment method and conceptualization of reward dominance/sensitivity (Byrd et al. 2014). One limitation of research in this area is that most studies used computer-based experimental tasks to assess punishment and/or reward sensitivity, and as such their findings lack ecological validity.

The majority of studies that have examined links between CU traits, punishment and/or reward sensitivity in a 'real world' context have focussed on parenting. Findings from cross-sectional studies suggest that harsh, punitive parental discipline does not have a significant impact on conduct problems in high CU children, consistent with the view that CU traits are characterized by punishment insensitivity (Oxford, Cavell, and Hughes 2003; Wootton, Frick, Shelton, and Silverthorn 1997). However, longitudinal research indicates that harsh discipline increases the severity of CU/CP over time (e.g., Hawes, Dadds, Frost and Hasking, 2011; Pardini, Lochman, and Powell, 2007). In contrast, reward-based parenting

strategies (e.g., praise, spending time with parents) and parental warmth predict decreases in CU traits (Hawes et al 2011; Pardini et al 2007). Evidence suggests that behavioural parenting interventions may be less effective in reducing conduct problems for high versus low CU children, possibly due to lower punishment sensitivity (Hawes, 2015). Consistent with this view, Hawes and Dadds (2005) found that time out was less effective in reducing conduct problems in children high versus low in CU traits, but reward-based strategies were equally effective. The only study to examine these factors in the school setting found that a behavioural intervention emphasizing reward-based strategies and de-emphasizing punishment-based strategies significantly reduced conduct problems in high CU children (Frederickson, Warren, Jones, Deakes, and Allen 2014).

There is currently little research on CU traits in an educational context, and even fewer studies have examined the influence of these traits on teacher-child interaction. Two recent studies reported that CU traits are associated with less closeness and greater conflict in the teacher-child relationship (Crum, Waschbusch and Willoughby 2015; Allen, Assary and Barker, 2015). To the best of our knowledge, no studies have examined teacher perspectives on CU traits and the effectiveness of classroom management strategies. An increased understanding of how children high in CU traits behave at school and their responsiveness to rewards and discipline is therefore likely to be invaluable for informing school-based intervention.

Quantitative investigation of CU traits, punishment and reward sensitivity

The aim of this study was to examine the relationship between CU traits, and responses to rewards and discipline in adolescent boys using a multi-informant, mixed methods approach. It was predicted that CU traits would be significantly related to reward sensitivity and punishment insensitivity. We also hypothesised that children categorised as

high in CU traits on the basis of separate teacher and child report would have significantly greater punishment insensitivity and reward sensitivity than children low in CU traits.

Method

Participants

Thirty-nine boys aged 12 to 13 years (M = 13.10 years, SD = 3.68) and eight teachers were recruited from an all-boys secondary school in London, United Kingdom. Most participants identified as Black British (n = 22), followed by Asian (n = 5), White (n = 4), or 'Other' ethnicity (n = 8). Approximately half (n = 19) reported English as their first language and 9 boys were eligible to receive free school meals. Most participants (n = 26) came from two-parent households, while the remainder belonged to a single parent family (n = 11), or lived with an extended family member (n = 2). Approximately half (n = 20) reported that at least one parent had a post-school qualification, 21% (n = 8) left school at or before 16, and one parent completed high school. Given overlap between CU traits and autism in presentation and correlates including low empathy and emotion deficits (Jones et al. 2010), teachers completed an autism symptom measure (Moul et al. 2015). No children fell above the clinical cut-off and therefore all were included in the analyses.

Measures

Family sociodemographic characteristics. A brief questionnaire assessed child age, gender, ethnicity, eligibility for free school meals, English as a first language, parent marital status and level of education.

Inventory of callous-unemotional traits (ICU; Frick 2004). Youth self-report and teacher-report versions of the ICU assessed the key dimensions underlying CU traits: callousness (11 items), uncaring (8 items), and unemotional (5 items). Scales are summed to form a total ICU score. Responses are reported on a 4-point scale (0 = 'not at all true' to 3 = 'definitely true'). The ICU has shown good reliability and validity for adolescent (Essau, Sasagawa, and Frick 2006) and teacher report (Ezpeleta et al 2013). Alphas for ICU total scores in the current sample were for .89 teacher report and .72 for child report.

Social responsiveness scale – brief (SRS-brief; Moul, Cauchi, Hawes, Brennan, and Dadds, 2015). A 16-item version of the SRS was completed by teachers to assess children's autism symptoms. 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 2002). Alpha was .92 for the SRS-brief total score.

*Multidimensional assessment profile of disruptive behaviour (MAP-DB; Wakschlag et al. 2012).*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'), and has good reliability and validity (Nichols et al. 2014). Alphas were .82 and .95 for child and teacher report, respectively.

Revised sensitivity to punishment and sensitivity to reward questionnaire for children (SPSRQ-C; Colder and O'Connor 2004). The reward responsivity scale of the revised SPSRQ-C consists of 7 items rated by children on a 5-point scale (1 = 'strongly disagree' to 5 = 'strongly agree'). The SPSRQ-C has good reliability (Colder and O'Connor 2004) and validity (Luman et al. 2012). Alpha was .64.

Strengths and difficulties questionnaire (SDQ; Goodman 1997). The SDQ assessed teacher report of child adjustment and prosocial behaviour. The SDQ comprises five subscales consisting of five items each: conduct problems (CP), hyperactivity, peer problems, emotional problems and prosocial behaviour. Responses are reported on a 3-point scale (0= 'not true' to 2='certainly true'). The SDQ has shown good reliability and validity (Goodman 2001). Alphas for SDQ subscales ranged from .68 to .94.

Procedure

Following receipt of institution ethics review board approval, letters providing information about the study were sent to parents. This was an opt-out study, so letters included a reply slip if parents wished to refuse consent. None were returned. The student questionnaires were administered in form time. Participating students had 30 minutes to complete the questionnaires under exam conditions. Students were informed that participation was not compulsory and that they could return a blank questionnaire if they wished. Forty questionnaires were distributed; one was returned incomplete. Following receipt of informed written consent from teacher, they were assigned a maximum of five pupils at random from their class list about whom to complete questionnaires, ensuring that a questionnaire pack was completed for each child in the study by one of the eight participating teachers.

Results

Descriptive statistics for the main study variables are presented in Table 1. Preliminary checking of assumptions indicated that data for the whole sample were suitable for parametric analyses.

Associations between CU traits, conduct problems, punishment and reward sensitivity

Two-tailed Pearson's correlations were conducted to investigate the associations between teacher and child report of CU traits, conduct problems, and sensitivity to discipline and rewards (Table 1). Higher levels of CU traits and more severe conduct problems were significantly related to greater punishment insensitivity based on child and teacher report. In contrast, there were no significant relationships between CU traits and reward sensitivity; or between teacher-reported conduct problems and reward sensitivity.

Group differences in demographic characteristics and child adjustment

A median split (Dadds et al. 2005; Frederickson et al. 2013) was performed on the ICU total score separately for teacher and child report in order to categorise participants as high or low in CU traits. Children categorised as high versus low on CU traits were then compared on demographic characteristics. There were no significant group differences regarding minority ethnicity status, membership of a single parent family, eligibility for free school meals, or parent education level (Table 2). Children high in CU traits showed significantly greater conduct problems, hyperactivity, and less prosocial behaviour than low CU children, but there were no significant group differences in emotional or peer problems.

Group differences in punishment and reward sensitivity

Assumptions for normality were violated for several variables when an EDA was conducted on the high and low CU groups formed on the basis of both teacher and child report. Therefore non-linear regression using bootstrapping at 1,000 resamples (Field 2013) was used in the analyses to ensure that relationships were statistically robust. We also checked whether punishment and reward sensitivity were significantly related to other variables that might confound the relationship of CU traits to punishment or reward sensitivity. Teacher report of CU traits was significantly related to hyperactivity, peer problems and autism; both teacher and child report of CU traits were significantly related to conduct problems (all *p*s < .05), so these were checked as covariates in the analyses. However, this did not alter the substance of the findings; as such the main effect of findings based on group status are reported without the inclusion of any covariates.

Separate one-way between-subjects analysis of variance (ANOVA) were conducted to examine differences between children high and low in CU traits (teacher-reported) on i) child-reported reward sensitivity and ii) teacher-reported punishment sensitivity (Table 1). Results revealed no significant effect of high versus low CU traits on reward sensitivity; $F(1, 37) = 1.81$, $p = .187$, $\eta_p^2 = .05$. However, children high in CU traits showed significantly greater punishment insensitivity than low CU children; $F(1, 37) = 36.99$, $p < .000$, $\eta_p^2 = .50$.

Separate one-way between-subjects ANOVAs were then conducted to examine differences between high and low CU groups (child-reported) on i) child-reported reward sensitivity and ii) child-reported punishment sensitivity (Table 1). Results found no significant effect of group on reward sensitivity; $F(1, 37) = .003$, $p = .958$, $\eta_p^2 = .00$. In contrast, there was a significant main effect of group for punishment sensitivity, with high CU children rated as less sensitive to punishment than low CU children; $F(1, 37) = 10.39$, $p = .003$, $\eta_p^2 = .22$. Overall, findings were consistent across teacher and child report of CU traits,

indicating that high CU children are rated as significantly lower in punishment sensitivity than low CU children, but there were no significant group differences for reward sensitivity.

A check on potential confounds to the relationship between CU traits and punishment insensitivity

Partial correlations were used to check for potential confounds to the significant association between teacher and child report of CU traits and punishment insensitivity. These included conduct problems, autism symptoms, emotional problems, peer problems and hyperactivity. The relationship between CU traits and punishment insensitivity remained significant when controlling for these potentially confounding variables (Table 3).

Qualitative investigation of teacher perspectives

The aim of this component of the study was to obtain teacher views on the effectiveness of reward and discipline strategies with pupils high in CU traits. Qualitative analysis of teacher interviews will provide additional depth to our conclusions, enabling us to gather information about responses to specific classroom management strategies and potentially revealing promising lines of future enquiry. We aimed to answer the following questions:

1. Are pupils high in CU traits less sensitive to discipline and more sensitive to rewards than pupils low in CU traits?
2. How do CU traits present in the school setting from a teacher perspective?
3. i) What are teachers' views on the effectiveness of discipline and reward strategies with pupils high in CU traits?

   ii) How do teacher views on the effectiveness of these strategies differ for pupils high in CU traits from the 'average' pupil?

Data collection

Semi-structured interviews were conducted with all eight teachers following completion of questionnaires to obtain their views on the effectiveness of rewards and discipline with i) pupils in general, and ii) pupils with CU traits (see Appendix A for interview questions). Teachers were assured of confidentiality in reporting their views. Following questions about pupil responses to rewards and discipline in general, teachers were provided with a brief description of youth with CU traits:

> "Some children seem to lack empathy and guilt, and display uncaring attitudes and behaviours in relation to others' feelings. These pupils may also be aggressive and place little value on their school performance."

All teachers identified one or more students who fit this description. Teachers were then asked questions about the behaviour of high CU children at school, followed by their response to discipline and reward strategies.

Data analysis

All interviews were audio-recorded and transcribed verbatim. Interviews were analysed using thematic analysis to identify recurring themes (Braun and Clarke 2006). The identification of themes was guided by theory and research indicating that children high in CU traits respond differently from typically developing children to rewards and discipline (Byrd et al. 2014). Coding was based on information gathered from the interview as a whole rather than restricted to answers to a specific question. Reliability was assured through moderation exercises carried out by the research team and consensus codes were recorded following team

discussion. Interviews were coded prior to analysis of quantitative data in order to minimise bias on the part of the research team and to ensure coders were blind to the child's CU status.

Results

Tables 4 and 5 present a summary of the themes arising from the teacher interviews for children with low versus high CU traits, respectively. For children low in CU traits, teachers reported using a wide range of reward strategies, including praise, non-verbal encouragement (e.g., smiles, nods), awarding volunteer roles, and tangible rewards (e.g., stickers, stamps). Discipline strategies were also diverse, including verbal warnings, time out, removal of points, and calling parents to inform them of the child's misbehaviour. The use of facial expressions and body language to display disapproval (e.g., shaking head, frowns) was reported by all teachers: "I often find that the kids pick up on my body language and facial expressions before I've said a word. It's definitely one of my most effective discipline strategies". Teachers recognised that discipline delivered in an aggressive manner was counterproductive, serving to escalate undesirable behaviour and damaging the teacher-child relationship. The importance of tailoring the reward or discipline strategy on the basis of individual child characteristics (e.g., age, intelligence, personality) was mentioned, essentially pre-empting our questions concerning children high in CU traits: "everything works differently for different students".

Teachers provided examples of callous, manipulative and deceitful behaviours consistent with the literature on the presentation of CU traits in children (Frick et al. 2013) (Table 5). Many behaviours were covert in nature, especially those concerning bullying and instigating conflict between peers: "They constantly wind other pupils up… insult them quietly, below teachers' hearing, or lying about things others have apparently said or done.

They are far more violent and manipulative outside of class… sometimes causing a fight between two others rather than fighting themselves." Teachers perceived these children as deriving pleasure from conflict: "They're totally uncaring, about the way they treat others and the way they are treated. Sometimes they can seem really hyperactive and excited about something, but that's usually when someone got hurt or there was a fight in the playground". More subtle behaviours such as avoidance of eye contact and lack of response to nonverbal cues were also reported: "they appear detached and keen to avoid eye contact", and "they seem to ignore the non-verbal stuff completely".

In contrast to the wide variety of strategies viewed as useful with the 'average' pupil, teachers had difficulty identifying rewards that were effective with high CU pupils: "they sometimes just laugh at them. They don't seem to 'get' why anyone would want them". However, praise and was identified as useful, but teachers suggested that this needs to be frequent and intense to have an impact: "I tend to be overly nice, giving additional praise because that seems to be more effective". Teachers reported that rewards could have undesirable consequences due to students' drive to attain social dominance: "they appear to be indifferent to reward strategies except for being given responsibility or specific roles in class, because then they abuse that additional power", and "Praise seems to work quite well because they'll take that and then show off with it".

Teachers reported that in contrast to low CU pupils, positive facial expressions and gestures appear to be ineffective: "smiling and using encouraging facial expressions or nods – body language - are likely to be ignored or met with mimicking and disrespect." Tangible rewards are sneered at: "One boy shouted out 'Ha- Miss, what is this? Who wants a f***ing sticker?' across the classroom, which devalued the reward for everyone in the class." Similarly, teachers reported that an effective strategy with the 'average' student appeared

ineffective with high CU pupils: “If they do something hurtful, asking others how he thinks others felt is pointless. It is like he simply doesn’t know or doesn’t care.”

Teachers also found it difficult to pinpoint effective discipline strategies for children high in CU traits: “A lot of the time, whatever I try seems to be water off a duck’s back”. Similar to reward techniques, communicating disapproval through facial expressions and body language did not appear to register with high CU pupils, an example from one teacher: “the rest of the class fall silent but that one child carries on, apparently oblivious to any non-verbal cues”, and another: “facial expressions seem to be less effective with these types of students”. Time out was repeatedly mentioned as a strategy to de-escalate a situation: “Isolating them from the class is effective in that it removes their audience and allows them time to calm down.” One teacher highlighted the importance of the parent-child relationship in relation to both rewards and discipline: “calling home can be effective with some students, very much depending on their relationship with their parents”. Another common theme was the use of strategies to prevent misbehaviour in the first place: “I encourage them to do jobs around the classroom so that I can have something to praise them for and to distract them from the beginnings of poor behaviour”.

Many teachers reported that high CU pupils show little respect for authority, and become confrontational with little provocation: “They respond disproportionately and aggressively… They escalate matters by arguing back and refusing to stop speaking about how unfair the discipline was.” Teachers reported finding the behaviour of children high in CU traits stressful, taking a toll on their sense of agency and competence as a teacher: “It can be really disheartening to realise as a new teacher to realise that all of the techniques you learned… are useless with these kids – you feel like a failure”. Sending the child to another member of staff or classroom temporarily was viewed helpful in these circumstances, but one

teacher expressed concern about over-use of this strategy for the child's learning: "I do send them out but I don't like to – they miss too much".

Discussion

Consistent with our prediction, we found a significant relationship between CU traits and punishment insensitivity. This association held on the basis of child and teacher report of CU traits, and after controlling for other child adjustment problems including conduct problems, hyperactivity and autism. Qualitative findings were largely consistent with our quantitative results, as teachers reported that few discipline strategies were effective for children high in CU traits in comparison to their peers. Our results are in line with past research linking CU traits with reduced sensitivity to punishment (Byrd et al. 2014). Qualitative findings also revealed the challenges teachers face implementing discipline strategies, given aggressive, disrespectful and/or uncaring responses from high CU pupils. Teachers recognized the need for calm and consistent discipline, viewing aggressive responses to pupils as merely serving to escalate conflict and damage the teacher-child relationship, regardless of student CU status.

The only discipline technique that teachers viewed as effective was removing the pupil from class. This is inconsistent with the findings of Hawes and Dadds (2005), perhaps due to the different age groups (adolescents vs. young children) and context in which time out was implemented (school vs. family). Teachers reported that opportunities to assert social dominance over peers appeared to function as a 'reward' for high CU children, therefore loss of this opportunity through removal from the classroom may serve as an effective discipline strategy. This is consistent with evidence suggesting that high CU adolescents' antisocial behaviour is motivated by a desire for social dominance (Pardini 2011), and heightened by

the presence of peers (Centifanti and Modecki 2013). However, time outside of the classroom was viewed as detrimental to the pupil's learning and so may be seen as a last resort. Ensuring that the pupil continues to complete schoolwork under the observation of another staff member is a potential solution, but clearly one that requires additional resources. Our findings indicating reduced sensitivity to punishment in high CU children are consistent with theories proposing that decreased response to punishment, including accompanying affective responses may interfere with the ability to internalise moral and social norms (Blair 1995; Dadds and Salmon 2003).

Contrary to our hypothesis, no significant associations were found between CU traits and increased reward sensitivity. Past studies that have found a link between CU traits and reward dominance have utilised larger, clinically referred samples (e.g., Barry et al. 2000; O'Brien and Frick 1996), therefore we may not have detected a relationship between these two variables due to our small, community sample. However, we assessed reward sensitivity in an interpersonal context (e.g., response to praise, social approval) through teacher interview teachers and child report on the SPSRQ-C (Colder and Colder 2004), whereas previous studies have tended to rely on experimental tasks that utilise competitive paradigms and offer tangible rewards (e.g., O'Brien and Frick 1996; Scerbo et al 1990). Future research may wish to investigate whether CU traits is associated with different types of rewards (e.g., tangible vs. social rewards) awarded in different contexts. Qualitative findings indicated that teachers viewed children high in CU traits as unresponsive to most rewards unless they enhanced the pupils' social status or enabled them to achieve (often antisocial) goals. Manipulation of social factors may be useful in promoting prosocial behaviour in high CU children, but clearly careful implementation and monitoring is needed. Teachers also noted that praise and positive attention helped to foster a positive teacher-child relationship and reduce misbehaviour with high CU pupils, consistent with research demonstrating that

positive parenting strategies predict decreases in CU/CP over time (Frick et al. 2003; Hawes et al. 2011; Pardini et al. 2007).

Another issue that came to light was a lack of recognition of nonverbal cues, consistent with research linking CU traits with deficits in recognizing emotional cues expressed via facial expressions and body posture (Blair et al. 2005; Muñoz 2009). Current theory of the development of CU traits argues that attention to others' emotional expressions alerts children to danger or signals disapproval and elicits affective discomfort, letting them know to stop, change or continue their behaviour (Blair 1995). This is consistent with teacher report that pupils high in CU traits continued with misbehaviour despite teacher facial expressions and body language indicating disapproval. Interestingly, pupils also seemed to be unaware, uncaring or mocking of teachers' positive facial expressions and body language. This lack of response to positive and negative nonverbal cues is consistent with theory suggesting that children high in CU traits demonstrate decreased attention to social and non-social cues that are irrelevant to their goals (Newmann 1998).

Teacher report of stress, feelings of lack of competence and agency when trying to manage the behaviour of high CU pupils, along with difficulties establishing and maintaining a positive teacher-child relationship mirrors findings from the literature on CU traits and parenting (Dadds et al. 2014; Fanti and Centifanti 2014). Our findings indicate that teachers are likely to need additional education, training and support to successfully implement behaviour management strategies with high CU pupils.

Future research and limitations

There are several limitations of the current research. First, our sample was small and consisted of all-male participants recruited from one school, limiting our ability to generalise study findings. Future research should investigate links between CU traits, punishment and

reward sensitivity in girls given gender differences in the presentation and aetiology of antisocial behaviour (Moffitt 2001). Second, the reliability of the reward sensitivity scale was suboptimal. However, it is consistent with scales with other widely-used scales, such as the CU scale from the Antisocial Process Screening Device (APSD; Frick 2001), and the consistency of findings across quantitative and qualitative analyses, as well as child and teacher informants provides support for the validity of our findings. Third, child views were restricted to questionnaire report. Inclusion of child interviews could further enrich our understanding of the impact of reward and discipline strategies on youth high in CU traits. Fourth, questionnaire and interview methods are open to subjective biases. Teacher perceptions may be overly pessimistic, possibly reflecting a poor teacher-child relationship. The inclusion of observational methods in future would help overcome this limitation and increase our understanding of this topic. Finally, teacher interviews related to a general description of a child high in CU traits, rather than reporting on specific children, preventing us from directly linking their views to child outcomes.

This study also possesses strengths, including its multi-informant, mixed methods approach. Previous studies have predominantly been quantitative and relied on experimental methods to assess punishment and reward sensitivity (Byrd et al. 2014). The current study is one of the few to examine the responses of high CU children to rewards and discipline in an educational context (see Frederickson et al. 2013 for an exception). One interesting finding derived from the qualitative findings was teacher report that high CU pupils avoid eye gaze during teacher-child interaction, consistent with research showing reduced eye gaze in antisocial children high in CU traits during interactions with parents (Dadds, Jambrak, Pasalich, Hawes and Brennan 2012; Dadds et al. 2012). If this finding is replicated, future research may wish to investigate links between CU traits and eye gaze in the school setting, particularly during teacher attempts at discipline.

Current study findings indicate that children high in CU traits are viewed by teachers as showing reduced sensitivity to most punishment and reward strategies. Future research employing observational methods can help to determine whether this is indeed the case or if teacher perceptions are overly pessimistic, possibly reflecting a poor teacher-child relationship. Our findings indicate that teacher-focussed interventions supporting classrom behaviour management are likely to be beneficial. To date, the bulk of research on intervention for CU traits has focussed on parent/family interventions. However, many undesirable behaviours associated with CU traits are more likely to be present at school (e.g., bullying, lack of concern for academic work). Our findings suggest that similar to parenting interventions (Allen 2015), school-based intervention programmes may need to modify existing strategies in order to optimize their effectiveness with high CU children.

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Appendix A

Interview Questions

1. What reward techniques do you use in your classes?
2. What types of discipline and limit setting strategies do you use?
3. Which types of i. Reward and ii. Discipline strategies do you consider to be:
    a. effective, and why?
    b. ineffective, and why?

[Description of youth with CU traits]

4. Do any of your pupils fit this description?
5. What is their behaviour like in class? Outside of class?
6. How do these pupils respond to i. the reward strategies you mentioned previously? and ii. the discipline/limit setting strategies you mentioned previously?
7. What other strategies have you found effective when dealing with these students?
8. What strategies do they not respond well to?
9. Do you modify i. Rewards and/or ii. Discipline/limit setting for these children compared to what you would usually do? If yes, how so?

Table 1. Descriptive statistics and correlations for CU traits, conduct problems, punishment and reward sensitivity

	M	SD	1	2	3	4	5
1. ICU total (child report)	25.44	8.67					
2. ICU total (teacher report)	26.15	12.96	.42**				
3. Conduct problems (teacher report)	1.97	2.44	.38*	.76†			
4. Punishment insensitivity (child report)	14.95	5.91	.58†	.54†	.54†		
5. Punishment insensitivity (teacher report)	14.13	6.98	.44**	.81†	.87†	.52†	
6. Reward sensitivity (child report)	23.87	4.17	.09	.16	.01	.07	.13

Note. ICU = Inventory of Callous-Unemotional Traits. *$p < .05$. **$p < .01$. †$p < .001$. Two-tailed.

Table 2. Demographic and adjustment data for children high versus low in CU traits: Child and teacher report

	Child report		Teacher report	
	Low CU	High CU	Low CU	High CU
	n = 18	*n* = 21	*n* = 21	*n* = 18
% English first language	17	30.8	20.5	28.2
% Child minority ethnicity	41	48.7	46.2	43.6
% Eligible for free school meals	5.1	17.9	10.3	12.8
% Single-parent family	7.7	20.5	10.3	17.9
% Parent 16 years education or less	13.8	13.8	17.2	10.3
SDQ scores: mean (sd)				
Conduct problems	-	-	0.67 (1.11)	3.5 (2.70)**
Emotional problems	-	-	.81 (1.33)	1.78 (2.21)
Hyperactivity	-	-	3.14 (2.63)	6.68 (3.23)**
Peer problems	-	-	1.47 (1.69)	2.50 (1.98)
Prosocial behaviour	-	-	7.57 (1.86)	3.61 (2.20)**
ICU total score	18.22 (4.65)	31.62 (6.11)**	16.24 (4.39)	37.72 (9.47)**
Punishment insensitivity	12.00 (5.12)	17.48 (5.43)*	9.62 (3.31)	19.39 (6.45)**
Reward sensitivity	23.83 (3.03)	23.90 (5.02)	-	-

Note. ICU = Inventory of Callous-Unemotional Traits; SDQ = Strengths and Difficulties Questionnaire. *$p < .05$. **$p < .001$. Two-tailed.

Table 3. Partial correlations between CU Traits and punishment insensitivity, controlling for potential confounds

	Controlled variable	Partial correlations
Punishment insensitivity – Child report	Conduct problems	.48*
	Emotional problems	.58**
	Peer problems	.57**
	Hyperactivity	.52*
	Autism	.56**
Punishment insensitivity – Teacher report	Conduct problems	.46*
	Emotional problems	.79**
	Peer problems	.79**
	Hyperactivity	.59**
	Autism	.76**

Note. *$p < .01$. **$p < .001$. Two-tailed.

Table 4. Qualitative findings for responses to reward and discipline strategies in children low in CU traits

Theme	Sub-theme	Examples
Effective reward strategies		Verbal praise
		Positive facial expressions and body language (e.g., smiles, nods)
		Positive points on school database, visible to teachers and parents.
		Names written on the whiteboard
		Tangible rewards or points exchanged for tangible rewards
		Reporting good behaviour to parents by telephone
		Asked to show work in front of the class
		Volunteer roles
	Factors associated with ineffective rewards	Rewards not delivered as promised
		Rewards out of proportion to the behaviour/task
		Over-use of rewards
		Reward not the right 'match' for the pupil in terms of age appropriateness, intelligence or personality
Effective discipline strategies		Verbal warnings
		Facial expressions and body language (e.g., shaking head, eye contact, frowns)
		Negative points on school database, visible to teachers and parents.
		Names written on the whiteboard
		Pupil given the option to comply or face a sanction.
		Time outside class, followed by a one-to-one talk about behaviour
		Reporting misbehaviour to parents by telephone
		Offer students a forced choice option between a consequence or the desired behaviour
	Factors associated with ineffective discipline	Delivery of discipline in an aggressive manner
		Discipline not the right 'match' for the pupil in terms of age appropriateness or personality
		Damage to the teacher-child relationship

Table 5. Qualitative findings for the presentation of high CU behaviour in school, and responses to rewards and discipline

Theme	Sub-theme	Examples
Presentation of CU traits	Interpersonal callousness	Lack of concern for the impact of their behaviour on others, including their friends Enjoyment of verbal and/or physical conflict between their peers Enjoyment of peer misbehaviour
	Physical aggression	Violent, particularly outside of class Blocking teachers and pupils from walking past
	Verbal aggression	Disrespectful towards teachers Name-calling, rude and argumentative
	Deceitfulness and manipulation	Lie about others' behaviour Instigate fights between other children Antagonise others Insult others' beneath teachers' hearing
	Response to nonverbal cues	Avoidance of eye contact Lack of recognition or response to facial expressions or other non-verbal cues
	Low concern for performance	Produce little work Off-task behaviour Appear detached and indifferent
Effective reward strategies		Praise given in front of the class Calling parents (when a positive parent-child relationship is present)
Positive response to rewards		Praise
Negative response to rewards	Negative impact on peers	Uncaring about rewards unless it relates to 'beating others' Any responsibility given in class is often abused. Pupils thrive on being "the best" and gloat to others
	Negative impact on teachers	Tangible rewards are belittled in front of class Positive facial expressions and body language are ignored or mimicked
Effective discipline strategies		Time outside of the classroom Calling parents (when a positive parent-child relationship is present)
	Prevention of misbehaviour	Repeated warnings Assign tasks to distract pupil and provide opportunities for praise Positive teacher-child relationship

Positive responses to discipline		Pupil calms down once removed from “their audience”
Negative responses to discipline		Pupils blame others, do not accept responsibility for their actions Aggressive responses to discipline Argue and complain about discipline Ignore attempts at discipline or limit setting
	Factors associated with ineffective discipline	Delivery of discipline in an aggressive manner Threatening but not enforcing consequences Over-use of discipline Ignoring ineffective as require frequent, intense positive attention to prevent misbehaviour
	Negative impact: peers	Attention to behaviour management restricts teachers’ ability to attend to other pupils
	Negative impact: teachers	Pupils increase teacher stress levels Pupils become confrontational with little/no provocation Lower teacher perceptions of competence and agency Teacher avoidance of discipline/limit-setting due to unpleasant pupil responses

Note. CU traits = callous-unemotional traits.