

Antisocial Behaviour and Teacher-Student Relationship Quality: The Role of Emotion-Related Abilities and Callous-Unemotional Traits

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Data sharing: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Abstract

Background: Childhood antisocial behaviour has been associated with poorer teacher-student relationship (TSR) quality. It is also well-established that youth with antisocial behaviour have a range of emotion-related deficits, yet the impact of these students' emotion-related abilities on the TSR is not understood. Furthermore, the addition of the Limited Prosocial Emotions specifier in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) indicates that understanding the role of callous-unemotional (CU) traits for youth with antisocial behaviour problems is of particular importance.

Aims: The aim of this study was to investigate the association between antisocial behaviour difficulties and the TSR by examining the influence of emotion-related abilities and CU traits.

Sample: Twelve teachers from 10 primary schools provided anonymised information on 108 children aged 6-11 years.

Results: Antisocial behaviour was associated with higher teacher-student conflict (but not closeness) as well as higher emotion lability/negativity and lower emotion understanding/empathy. Emotion lability/negativity was associated with higher teacher-student conflict (but not closeness), and emotion understanding/empathy was associated with lower teacher-student conflict and higher closeness. CU traits was associated with higher teacher-student conflict and lower teacher-student closeness (controlling for antisocial behaviour more broadly). We found no evidence of a moderating effect of CU traits or emotion-related abilities on the association between antisocial behaviour and TSR quality.

Conclusions: Interventions for behaviour difficulties should consider teacher-student relationships in the classroom. Strategies which aim to improve teacher-student closeness as well as reduce teacher-student conflict may be of particular value to students with high CU traits.

Keywords: antisocial behaviour; callous-unemotional traits; conduct problems; emotion lability/negativity; emotion regulation; SEMH; teacher-student relationship

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Childhood antisocial behaviour is common in the classroom and has a negative impact on students and teachers (Allen, Bird, & Chhoa, 2018; Department for Education, 2014). Childhood antisocial behaviour includes defiance, deceit, aggression, and rule-violation. Children with severe and persistent forms of this behaviour may be diagnosed with Oppositional Defiant Disorder or Conduct Disorder (Diagnostic and Statistical Manual of Mental Disorders, DSM-5; American Psychiatric Association, 2013). Antisocial youth show poorer school adjustment, are more likely to truant, drop out of school, or be excluded, and may have related long-term outcomes including poor academic achievement, unemployment, and criminality (see Erskine et al, 2016). Managing disruptive behaviour in the classroom increases demands on teachers' cognitive and emotional resources and is a key contributor to teacher stress and burnout (Friedman-Krauss, Raver, Morris, & Jones, 2014). As a result, emotionally negative interactions between the teacher and student are likely to arise (Jennings & Greenberg, 2009). It is not surprising then that children's behaviour problems have consistently been associated with a poor quality teacher-student relationship (TSR) (see McGrath & Van Bergen, 2015).

TSR quality is typically assessed in terms of friction between the teacher and student (i.e. conflict) and the level of affection, warmth and open communication (i.e. closeness) (Pianta & Nemitz, 1991). Longitudinal studies have shown a dynamic relationship between child behaviour and TSR quality. For example, elevated levels of teacher-student conflict and low levels of teacher-student closeness in early childhood has been found to predict later behaviour problems, such as physical aggression (Hughes & Cavell, 1999; O'Connor, Collins, & Supplee, 2012; Runions et al., 2014). Similarly, a positive TSR characterised by warmth and closeness has been associated with decreased aggressive behaviour (Hamre & Pianta, 2001; Miller-Lewis et al., 2014). Early behaviour difficulties have also been associated with subsequently poorer TSRs, in particular increased conflict (Henricsson & Rydell, 2004; Ladd, 2003; Hopman et al., 2019; Skalická, Stenseng, & Wichstrom, 2015). Reciprocal relations between behaviour and student-teacher conflict have also been

documented (Doumen et al., 2008; Zhang & Sun, 2011). For example, Doumen et al. (2008) reported that aggressive behaviour at the start of the pre-school year predicted increased teacher-student conflict by mid-year, and mid-year conflict predicted increased aggressive behaviour at the end of the year. Children with behaviour difficulties then may be prone to a problematic cycle of negative teacher-student interactions and poor school adjustment and behaviour.

Despite evidence of an association between child behaviour difficulties and the TSR, little is known about the mechanisms involved. One suggestion is that the poor academic achievement of students with behaviour difficulties (Erskine et al, 2016; Masten et al., 2005) may be accountable (Gallagher, 2013; Graziano et al. 2007; Horan, Brown, Jones, & Aber, 2016). Conflict may develop when students receive negative feedback as a result of poor achievement and when extra effort is required by teachers to produce positive academic outcomes (Allen et al., 2018; Friedman-Krauss, Raver, Morris, & Jones, 2014). Teacher-student conflict may also be responsible for poor achievement. In a longitudinal study following children from age 6 to 11, Stipek and Miles (2008) found the association between aggressive behaviour and poor achievement was partially mediated by teacher-student conflict.

Besides poor academic outcomes, the behavioural characteristics of antisocial youth, including aggression, bullying, and poor social skills, may evoke negative responses from teachers, and in turn influence the TSR quality (Nurmi, 2012). Teachers report that disruptive behaviour makes teaching more difficult and view externalising behaviour, especially aggression, as more problematic than other difficulties such as social withdrawal (Arbeau & Coplan, 2007; Chang, 2003; Coplan, Bullock, Archbell, & Bosacki, 2015). Furthermore, evidence from teacher interviews and student self-reports suggest that antisocial students respond to teachers' limit-setting and discipline in a confrontational and hostile manner (Allen, Morris & Chhoa, 2016; Allen et al, 2018; Trachtenberg & Viken, 1994).

Social competency (e.g. sharing, helping, and relationship initiation), beyond the absence of externalising symptoms, has also been found to influence TSR quality. In a study of 230 primary school children, students with behaviour difficulties but good prosocial skills had a better quality TSR than those with behaviour difficulties with low prosocial skills (Fowler, Banks, Anhalt, Der, & Kalis, 2008). However, results have been mixed with some reporting social competence not to be predictive of the TSR quality (Henricsson & Rydell, 2004; Skalická et al., 2015; Zhang & Nurmi, 2012). In a longitudinal study, Skalická et al. (2015) found that pre-school children's externalizing behaviour (e.g. rule-breaking and aggression), rather than their poor social skills (e.g. lack of cooperation or sociability), predicted student-teacher conflict. Nevertheless, the use of broad measures of externalising behaviour, which include hyperactive and inattentive symptoms, may account for these associations.

One area which has received little research attention when examining the quality of the TSR is the emotional characteristics of students with antisocial behaviour. It is well-established that antisocial youth have a range of emotion-related deficits, including more labile emotions (emotional displays which are disproportionate to the situation); high levels of negative emotionality (e.g. anger and frustration); poorer emotion recognition and understanding; and less effective use of strategies to regulate their emotions (Eisenberg et al., 2010; Kostiuk & Fouts, 2002; O'Kearney, Salmon, Liwag, Frotune, & Dawel, 2017; Rehder et al., 2017).

Antisocial behaviour has also been associated with biological correlates of emotion processing, including structural and functional abnormalities of the amygdala and interacting cognitive control areas of the prefrontal cortex (see Cohn, Popma, Raine, & Cima, 2016; Portnoy et al., 2013).

Of particular interest to the study of emotion-related deficits is a subgroup of antisocial children with a distinct pattern of callous and unemotional behaviour (CU traits), including low empathy and restricted affect in terms of fear, guilt, and sadness (Frick, Ray, Thornton, & Kahn, 2014; Northam & Dadds, 2020). These traits are now recognised in the DSM-5 with the addition of a 'limited prosocial emotions' specifier for Conduct Disorder (American

Psychiatric Association, 2013). Subtyping by CU traits has proven valuable to our understanding of severe behavioural difficulties (e.g. Haas, Becker, Epstein & Frick, 2018; Waller, Hyde, Baskin-Sommers & Olsen, 2017; Warren, Jones, & Frederickson, 2015). However, it is only recently that CU traits has been included in an examination of TSR quality (Allen et al., 2016; Allen et al., 2018; Baroncelli & Ciucci, 2020; Crum, Waschbusch, & Willoughby, 2016).

There is reason to speculate that the emotion-related characteristics of antisocial students play a role in TSR quality. Firstly, there is a robust association between poor emotion understanding and the security of the mother-child attachment (Cooke, Stuart-Parrigon, Movahed-Abtahi, Koehn, & Kerns, 2016). Similarly, children who do not appropriately regulate their emotions have been found to have a poorer mother-child attachment, poorer prosocial skills, and poorer relationships with peers (Kerns, Abraham, Schlegelmilch, & Morgan, 2007; Lopes, Salovey, Côté, Beers, & Petty, 2005; Rydell, Thorell, & Bohlin, 2007). We can speculate then that there will be an association between emotion-related abilities and the quality of the attachment a student forms with their teacher (see Bergin & Bergin, 2009). Secondly, there is evidence to suggest that poor emotion understanding, poor emotion regulation, and negative emotionality have an adverse effect on school adjustment and academic success (Al Hendawi, 2013; Franco, Beja, Candeias & Santos, 2017; Voltmer & Salisch, 2017), and that these emotion-related behaviours cause disruption in the classroom and create a challenge to teaching (Blair & Diamond, 2008; Stulhman & Pianta, 2002).

Similarly, the distinct emotional characteristics of children with CU traits, including a lack of empathy and guilt for harm caused to others, a low fear response to punishment or social threat, and disinterest in forming social bonds (e.g. Ciucci, Baroncelli, Golmaryami, Frick, 2015; Dadds et al., 2009; Georgiou et al., 2019; Waller & Wagner, 2019), are likely to influence the TSR quality. There is already considerable evidence demonstrating that youths

with high CU traits have poorer relationships with peers and parents (e.g. Muñoz, Kerr, & Besic, 2008; Waller et al., 2017; Pasalich, Dadds, Hawes, & Brennan, 2012; Trentacosta et al., 2019). The lack of affection and remorse of these children has also been reported to cause parents and teachers to withdraw (Hwang, Waller, Hawes, & Allen, in press; Kimonis et al., 2013; Muñoz, Pakalniskiene, & Frick, 2011). In the context of the classroom, CU traits have been associated with expressed anger and aggression in response to discipline and limit-setting, and elevated rates of classroom rule violations (Allen et al., 2018; Haas, Becker, Epstein & Frick, 2018; Waschbusch, Graziano, Willoughby & Pelham, 2015). Moreover, teachers identify the callous disregard for their disruptive behaviour to be particularly problematic to their teaching (Allen et al., 2018; Gest, Madill, Zadzora, Miller, & Rodkin, 2014).

Evidence is now emerging which supports an association between CU traits and TSR quality. CU traits in children and adolescents have been associated with greater teacher-student conflict and lower teacher-student closeness beyond the effect of antisocial behaviour more broadly (Allen et al., 2018; Baroncelli & Ciucci, 2020; Crum, Waschbusch, & Willoughby, 2016; Horan et al., 2016). While these studies have advanced our understanding of CU traits in the classroom, some limitations should be noted. In particular, Horn et al.'s study did not use a well-validated measure of CU traits; Baroncelli and Ciucci relied on self-reports; and Allen et al.'s studies used a small sample from a single school.

The aim of the current study was to extend previous research by exploring the role of children's emotion-related abilities in the association between antisocial behaviour and TSR quality. Since it has been argued that the nature of the TSR may be more emotion-centred in primary school, where students are assigned to one class teacher for the school year, than in secondary school (Baroncelli & Ciucci, 2020), as well as evidence to suggest that early school adjustment has an important impact on adolescent wellbeing (Carlson et al., 1999), we investigated the behaviour of primary school students in the current study.

In-line with previous research, we predicted that antisocial behaviour would be associated with 1) TSR quality (greater teacher-student conflict and less teacher-student closeness), and 2) emotion-related abilities (greater emotion lability and negativity and poorer emotional understanding and empathy). We also predicted that students' emotion-related characteristics i.e. high lability/negativity, poor emotional understanding/empathy, as well as high CU traits, would be associated with greater teacher-student conflict and lower closeness. Finally, we explored whether there were any moderating effects of these emotion-related characteristics on the association between antisocial behaviour and TSR quality. As both antisocial behaviour and emotion-related difficulties have been associated with problems forming and maintaining positive relationships, as well as several school adjustment challenges, we hypothesised that the combination of antisocial behaviour and emotion-related difficulties would predict a poor quality TSR.

Method

Participants

We recruited 12 teachers (two male) from 10 mainstream primary schools across England to provide data for 108 children (66 male) aged 6-11 ($M = 8.88$, $SD = 1.78$). Parental consent was not required for this anonymised data and further demographic information was not collected due to the nature of this recruitment method.

Measures

Antisocial behaviour was measured using the 12-item Conduct Problems scale from the teacher-report version of the Behaviour Assessment System for Children-2 (BASC-II; Reynolds, Kamphaus, & Vannest, 2011). Behaviour was rated on a 4-point scale of frequency from 0 "Never" to 3 "Almost Always", with higher scores reflecting more problems. The teacher-report has good reliability and validity (Flanagan, Alfonso, Primavera, Povall &

Higgins, 1996; Reynolds & Kamphaus, 2004; Vaughn, Riccio, Hynd, & Hall, 2010), with high reliability for the Conduct Problems subscale in the current sample ($\alpha = .88$).

The 24-item Inventory of Callous-Unemotional Traits (ICU; Kimonis et al., 2008) assesses callous (11 items), uncaring (8 items), and unemotional (5 items) traits. Behaviour was rated on a 4-point scale from 0 “Not at all true” to 3 “Definitely true” with higher scores indicating greater problems (total score of 72). The teacher version has good reliability and validity (Docherty, Boxer, Huesmann, O'Brien, & Bushman, 2017; Ezpeleta, Osa, Granero, Penelo, & Domènech, 2013; Roose, Bijttebier, Decoene, Claes, & Frick, 2010), with high reliability in the current sample ($\alpha = .91$).

The 24-item Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) rates emotion-related behaviour on a four-point scale of frequency from 1 “Never” to 4 “Always”. The Emotion Regulation subscale (8-item) was used to assess emotional understanding, empathy, and appropriateness of emotional expressions (e.g. “Is empathic toward others”; “can say when s/he feels sad, angry or mad”) with lower scores indicating poorer emotion-related abilities. The Emotion Lability/Negativity subscale (15 items) assesses emotional reactivity, intensity and flexibility, and the expression of negative emotions (e.g. “is prone to angry outbursts”; “exhibits wide mood swings”) with higher scores reflecting greater emotion-related difficulties. Good reliability and validity has been reported (Molina et al., 2014; Shields & Cicchetti, 1997), with high reliability in the current study (Emotion Regulation: $\alpha = .79$ Emotion Lability/Negativity: $\alpha = .93$).

The Student-Teacher Relationship Scale-short form (STRS-sf; Pianta, 2001) assesses the teacher’s perception of the quality of their relationship with the student, using 15 items rated on a 5-point scale from 1 “Definitely does not apply” to 5 “Definitely applies”. The Conflict subscale (8 items) assesses difficulty and friction between the teacher and student (e.g. “this

child and I always seem to be struggling with each other”). The Closeness subscale (7 items) assesses affection, warmth and open communication (e.g. “the child openly shares his/her feelings and experiences with me”). The teacher-reported STRS-sf has good reliability and validity (Drugli, Klökner & Larsson, 2011; Rudasill, Reio, Stipanovic & Taylor, 2010), with high reliability in the current sample ($\alpha = .90$ for both subscales).

Procedure

Ethical approval was granted from <anonymity>. Teachers were given written information outlining the purpose of the study and their right to withdraw. Three teachers were recruited from a single school as part of a larger study and completed paper copies of all questionnaires. All other teachers were recruited through an advert placed on social media and completed the questionnaires online. Teachers could complete the questionnaire about any student/s that they had worked with for at least one academic term (approximately 12 weeks) and were given the option to complete the questionnaires for just one student or multiple students, with £5 vouchers given for every five students.

Data analysis

Analyses were carried out using SPSS version 25 (IBM Corp. 2017). Across all variables, the values for asymmetry (-.49 and .82) and kurtosis (-.93 and .24) were between -2 and +2 and were therefore considered acceptable for parametric analyses (see George & Mallery, 2010). Before addressing our main research questions, the multilevel nature of the data was considered using the mixed command in SPSS, following guidelines from Hayes (2006) and Heck, Thomas, and Tabata (2013). As no significant teacher clustering was found (see details in Supplementary Materials), we proceeded with single-level linear regression models.

Associations between antisocial behaviour, emotion-related characteristics, and teacher-student relationship quality.

Bivariate Pearson correlations were used to examine associations between students' age, gender, antisocial behaviour, emotion-related characteristics, and TSR quality. This was followed by a series of linear regression models to assess the association between 1) antisocial behaviour (BASC-II conduct problems) and TSR quality (STRS-sf conflict and closeness); 2) antisocial behaviour and emotion-related abilities (i.e. lability/negativity and emotion understanding/empathy; ERC); 3) emotion-related abilities and TSR quality; and 4) CU traits (ICU total scores) and TSR quality (controlling for antisocial behaviour more broadly).

The moderating role of children's emotion-related characteristics in the association between antisocial behaviour and teacher-student relationship quality.

Associations between antisocial behaviour and the TSR quality were explored further by considering whether there was a moderating effect of children's emotion-related characteristics. First, antisocial behaviour (BASC-II conduct problems scores) was entered into the regression model with teacher-student conflict (STRS-sf conflict subscale) as the outcome variable. One of three emotion-related variables (ERC emotion lability/negativity subscale, ERC emotion regulation subscale, or ICU total scores) was then entered followed by an interaction term between behavioural difficulties and the emotion-related variable. Predictor variables were mean-centred. This process was repeated with teacher-student closeness (STRS-sf closeness subscale) as the outcome variable.

Results

Means and standard deviations are presented in Table 1.

Associations between antisocial behaviour, emotion-related characteristics, and teacher-student relationship quality.

Pearson bivariate correlations are presented in Table 2. There was a significant positive association between antisocial behaviour and teacher-student conflict, but not closeness.

Antisocial behaviour was also significantly associated with greater emotion lability/negativity and poorer emotion understanding/empathy. CU traits was significantly positively associated with teacher-student conflict and lability/negativity, and significantly negatively associated with teacher-student closeness and emotion understanding/empathy. Emotion lability/negativity was significantly positively associated with teacher-student conflict, and emotion understanding/empathy was significantly negatively associated with teacher-student conflict. Students' age and gender were not significantly associated with any variables and therefore these variables were not included in subsequent analyses.

In separate linear regressions, antisocial behaviour was significantly positively associated with (and explained a significant proportion of variance in) teacher-student conflict, $\beta = .69$, $t_{(106)} = 9.92$, $p < .001$, $R^2 = .48$, $\Delta F_{(1, 106)} = 98.37$, $p < .001$, but not teacher-student closeness, $\beta = -.01$, $t_{(106)} = .09$, $p < .928$, $R^2 = .00$, $\Delta F_{(1, 106)} = .01$, $p = .928$. Antisocial behaviour was significantly positively associated with (and explained a significant proportion of variance in) lability/negativity, $\beta = .75$, $t_{(106)} = 11.80$, $p < .001$, $R^2 = .57$, $\Delta F_{(1, 106)} = 139.35$, $p < .001$, and significantly negatively associated with (and explained a significant proportion of variance in) emotion understanding/empathy, $\beta = -.20$, $t_{(106)} = 2.07$, $p = .041$, $R^2 = .04$, $\Delta F_{(1, 106)} = 4.29$, $p < .041$.

CU traits was significantly positively associated with (and explained a significant proportion of variance in) teacher-student conflict, $\beta = .33$, $t_{(105)} = 4.25$, $p < .001$, $R^2 = .56$, $\Delta F_{(2, 105)} = 66.12$, $p < .001$; and significantly negatively associated with (and explained a significant proportion of variance in) teacher-student closeness, $\beta = -.77$, $t_{(105)} = 8.45$, $p < .001$, $R^2 = .41$, $\Delta F_{(2, 105)} = 35.73$, $p < .001$, while controlling for antisocial behaviour more broadly¹.

¹ Due to the conceptual overlap between antisocial behaviour and CU traits, collinearity diagnostic factors were used. Tolerance statistics for behavioural difficulties and CU traits scores, and the interaction term were .66, .68, and .95, and the variance inflation factor was 1.53, 1.48, and 1.05 respectively. Since a tolerance statistic below .20 and a variance inflation factor above 5 are considered to suggest concern (Fields, 2013), we can assume multicollinearity was not a problem here.

Emotion lability/negativity was significantly positively associated with (and explained a significant proportion of variance in) student-teacher conflict, $\beta = .85$, $t_{(106)} = 16.73$, $p < .001$, $R^2 = .73$, $\Delta F_{(1, 106)} = 279.81$, $p < .001$, but not student-teacher closeness, $\beta = -.02$, $t_{(106)} = .19$, $p = .85$, $R^2 = <.01$, $\Delta F_{(1, 106)} = .04$, $p = .85$. Emotion understanding/empathy was significantly negatively associated with (and explained a significant proportion of variance in) student-teacher conflict, $\beta = -.38$, $t_{(106)} = 4.26$, $p < .001$, $R^2 = .15$, $\Delta F_{(1, 106)} = 18.12$, $p < .001$, and significantly positively associated with (and explained a significant proportion of variance in) student-teacher closeness, $\beta = .68$, $t_{(106)} = 9.56$, $p < .001$, $R^2 = .46$, $\Delta F_{(1, 106)} = 91.39$, $p < .001$.

The moderating role of emotion-related characteristics in the association between children's antisocial behaviour and teacher-student relationship quality.

Antisocial behaviour scores were entered in a linear regression model with either teacher-student conflict or closeness as the outcome variable, and one of three emotion-related variables (lability/negativity, emotion understanding/empathy, or CU traits) as a potential moderator. Standardised coefficients and change statistics for these models are presented in Tables 3 (conflict) and 4 (closeness). The interaction term was not statistically significant in any of the models, suggesting that there was no moderation effect.

Discussion

There is a well-established link between behaviour difficulties and the quality of the TSR (McGrath & Van Bergen, 2015). The aim of the current study was to explore this association by examining the role of the emotion-related characteristics of these children. The first hypothesis that there would be an association between primary school students' antisocial behaviour and TSR quality was partially supported, in that teacher-reported behaviour difficulties were associated with higher teacher-student conflict, but were not significantly associated with teacher-student closeness. This is in-line with previous research which suggests that these children have a TSR characterised by high conflict, even when normal

levels of teacher-student closeness are found (Henricsson & Rydell, 2004; O'Connor et al., 2012; Zhang & Sun, 2011). Part of a teacher's role is to give instructions and set rules, as well as monitor behaviour and discipline students. This is likely to cause frustration to children with antisocial behaviour, who may then respond to these boundaries with anger and hostility (Allen et al., 2016; Allen et al., 2018; Trachtenberg & Viken, 1994). It is easy then to see how teacher-student conflict may arise. Similarly, just as a difficult relationship with parents characterised by harsh discipline and coercive interactions has been associated with subsequent behaviour problems (Goulter et al., 2019), we can speculate that a conflicting teacher-student relationship could lead to behaviour difficulties in the classroom. Indeed, social learning theory suggests that children's behaviour is shaped by observing the behaviour of their caregivers and influenced by the way in which the caregiver responds to the child's behaviour (Bandura & Walters, 1971). Similarly, coercion and harsh discipline may escalate aggressive and disruptive behaviour (Patterson, 2016).

We found evidence of a distinction between antisocial students with and without CU traits in terms of the TSR quality. Whereas antisocial behaviour was not associated with teacher-student closeness, CU traits was associated with lower teacher-student closeness, as well as greater teacher-student conflict (while controlling for antisocial behaviour). The lack of association found between teacher-student closeness and antisocial behaviour more broadly may be due, in part, to teachers reporting that these children do not openly communicate their feelings, albeit through angry and aggressive outbursts. The characteristic restricted affect of CU traits, in terms of low fear, guilt and sadness (Northam & Dadds, 2020), as well as low affiliative reward (i.e., deficits in seeking out or getting pleasure from closeness with others; Waller & Wagner, 2019) may account for the low closeness reported by teachers. Furthermore, the distinctive callous traits of these children may make a warm and affectionate relationship for the teacher particularly difficult. Indeed, it has been reported that parents and teachers have a tendency to withdraw from CU behaviours (Hwang et al., in press; Kimonis et al., 2013; Muñoz et al., 2011). Furthermore, a TSR characterised by low

closeness, may cause a rise in CU traits. While CU traits, like antisocial behaviour, has previously been associated with parental harshness and coercion (Mills-Koonce et al., 2016; Waller et al., 2012), the most consistent parenting style associated with CU traits has been low parental warmth (Goulter et al., 2019; Waller et al., 2014). It may be that a relationship characterised by warmth, involvement, and responsiveness from the caregiver, whether parent or teacher, promotes a student's emotion-related abilities and prosocial behaviour (Baroncelli & Ciucci, 2020).

We also examined the emotion-related abilities of students in terms of emotion understanding and empathy, and emotion lability and negativity. As predicted, we found that antisocial behaviour was associated with greater lability/negativity and poorer emotion understanding/empathy. This supports previous literature which demonstrates deficits in a range of emotion-related processes in antisocial youth (e.g. Eisenberg et al., 2010; O'Kearney et al., 2017; Rehder et al., 2017). Furthermore, the hypothesis that there would be an association between emotion-related abilities and the TSR was partially supported in that lability/negativity was positively associated with teacher-student conflict (but not closeness), and emotion understanding/empathy was negatively associated with teacher-student conflict and positively associated with closeness. Graziano et al. (2007) similarly found that scores on the emotion regulation subscale of the ERC predicted the TSR. Nevertheless, we found no evidence of a moderating effect of emotion-related characteristics on the association between antisocial behaviour and TSR quality.

Limitations

This study was one of only a few to examine the association between CU traits and the TSR quality and, to the best to our knowledge, was the first to examine the role of different emotion-related abilities in the relationship between antisocial behaviour and the TSR. Nevertheless, some methodological limitations should be noted. Firstly, the direction of associations cannot be determined from this cross-sectional design. There is some evidence

that behaviour problems may lead to poor TSR quality (e.g. Hopman et al., 2019; Pakarinen et al., 2017), while others have found that a difficult TSR is associated with subsequent behaviour problems or that a reciprocal association exists (Doumen et al., 2008; Zhang & Sun, 2011). Secondly, only teacher-reports were used and were collected at a single time point, therefore shared reporter variance may have resulted in the significant associations. Subjective bias due to the presence of CU traits, antisocial behaviour, and/or the teacher-student quality may have also influenced the teachers' reports. In addition, while the ERC covers a range of emotion-related abilities (including emotion understanding, empathy, lability, and negativity), other emotion-related abilities, such as the child's use of emotion regulation strategies, were not assessed. The use of additional informants, including parent-reports of child behaviour and student-reports of the TSR, as well as observational methods, would allow a more detailed assessment of children's emotion-related behaviour and their interactions with teachers. Finally, while teachers were selected from schools across the UK, only a small sample was used and teachers did not report on all students in their class, reducing data representativeness. Additional descriptive details regarding the teachers (e.g. gender; years of experience; hours spent with the student) would also be informative. There is some suggestions that more experienced teachers may appraise challenging behaviour differently (Borg & Falzon, 1990), but this hypothesis would be worth testing more formally in the context of the current work.

Implications and conclusions

The association between antisocial behaviour and teacher-student conflict has important implications for the classroom. Since previous research has shown that the quality of the TSR influences children's later behaviour (e.g. O'Connor et al., 2012; Runions, 2014), teacher-student conflict may lead to further behaviour difficulties. It has been shown that, without intervention, teacher-student conflict can continue to increase in children with behaviour difficulties and that the longer the child is exposed to such conflict, the poorer their

academic outcomes (Spilt, Hughes, Wu, & Kwok, 2012). The student and teacher may then get caught in a downward spiral of teacher-student conflict, challenging behaviour, and poor school outcomes.

Furthermore, the current finding that CU traits are associated with both greater student-teacher conflict and lower closeness highlights the need to consider the CU traits of students when trying to understand and intervene with classroom behaviour difficulties. CU traits are a particular challenge in terms of intervention (see Hawes, Price, & Dadds, 2014; Wilkinson, Waller, & Viding, 2015). However, there is evidence that CU traits can be responsive to intervention when programmes are tailored to account for the distinct behavioural and emotional characteristics of these youths (e.g. Datyner, Kimonis, Hunt, & Armstrong, 2016; Frederickson, Jones, Warren, Deakes, & Allen, 2013; Miller et al., 2014). Based on the current findings, improving the TSR quality could also be a target for interventions for these children. A novel school-based intervention, 'Playing-2-gether', aimed at decreasing behaviour difficulties by improving the TSR quality and teachers' behaviour management, has shown promising results in terms of reductions in student-teacher conflict and antisocial behaviour (Vancraeyveldt, Verschueren, Van Craeyveldt, Wouters, & Colpin, 2015; Vancraeyveldt, Verschueren, Wouters, et al., 2015). However, initial improvements in student-teacher closeness did not remain at post-intervention. A similar approach, with more emphasis on improving teacher-student closeness could show promise for students with CU traits. Indeed, evidence suggests that high-quality interactions with an adult figure, in particular those characterised by warmth and involvement, can reduce antisocial behaviour and CU traits (Dadds, English, Wimalaweera, Schollar-Root & Hawes, 2019; Pardini, Lochman, & Powell, 2007).

In summary, the association between antisocial behaviour and TSR quality may have negative effects that are detrimental to the child, teacher and other students. Longitudinal studies that examine changes in behaviour, emotion-related abilities, and the TSR over time

are needed to unravel causal relationships. Importantly, we can conclude that interventions for youths with antisocial behaviour difficulties need to move beyond the 'problem child' approach to consider relations in the classroom and the perceptions, expectations, and behaviour of teachers. Support could be offered to teachers to improve the TSR with children who have such difficulties, including a better understanding of the emotion-related characteristics of these students.

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Tables

Table 1. *Means and standard deviations of child behaviour and the teacher-student relationship quality*

Table 2. *Correlations between child behaviour, the teacher-student relationship, and emotion-related abilities*

Table 3. *Regression coefficients and change statistics for predictors of teacher-student conflict*

Table 4. *Regression coefficients and change statistics for predictors of teacher-student closeness*

Table 1. Means and standard deviations of child behaviour and the teacher-student relationship quality (N = 108)

	Mean	SD
Behaviour difficulties ^a	53.81	11.44
CU traits ^b	26.51	12.57
Teacher-student conflict ^c	17.28	7.49
Teacher-student closeness ^c	24.43	5.58
Emotion understanding/empathy ^d	22.77	3.86
Emotion lability/negativity ^e	28.23	8.66

^aBehaviour Assessment System for Children-2 (BASC-II), standardised scores; ^bInventory of Callous Unemotional Traits (ICU), raw scores; ^cStudent-Teacher Relationship Scale - Short Form (STRS-sf), standardised scores; ^dEmotion Regulation Checklist (ERC), Emotion Regulation subscale, raw scores; ^eEmotion Regulation Checklist (ERC), Emotion Lability/Negativity subscale, raw score

Table 2. Correlations between child behaviour, the teacher-student relationship quality, and emotion-related abilities (N = 108)

	Age	Gender	Teacher-student conflict ^c	Teacher-student closeness ^c	Emotion regulation ^d	Emotion lability/ negativity ^d
Behaviour difficulties	.13	-.10	.69**	-.01	-.20*	.75**
Callous- unemotional traits ^b	.10	-.03	.62**	-.53**	-.63**	.49**
Teacher-student conflict ^c	.16	-.08	-	-.21*	-.38**	.85**
Teacher-student closeness ^c	-.15	.27	-	-	.68**	-.02
Emotion regulation ^d	.00	.05	-	-	-	-.30**
Emotion lability/negativity ^d	.06	-.15	-	-	-	-

^aBehaviour Assessment System for Children-2 (BASC-II); ^bInventory of Callous Unemotional Traits (ICU); ^cStudent-Teacher Relationship Scale - Short Form (STRS-sf); ^dEmotion Regulation Checklist (ERC). Significant correlations at * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3. Regression coefficients and change statistics for predictors of teacher-student conflict^a (N = 108)

	Model 1		Model 2		Model 3	
	β	t	β	t	β	t
Behaviour difficulties ^b	.13	1.63	.66	9.67***	.52	6.43***
Emotion lability/negativity ^c	.76	9.85***	-	-	-	-
Behaviour difficulties * Emotion lability/negativity interaction	-.03	.47	-	-	-	-
Emotion regulation ^c	-	-	-.24	3.41***	-	-
Behaviour difficulties * Emotion regulation interaction	-	-	.09	1.28	-	-
CU traits ^d	-	-	-	-	.33	4.12***
Behaviour difficulties * CU traits interaction	-	-	-	-	-.04	.57
R^2	.73		.55		.56	
ΔR^2	.25		.07		.08	
$\Delta F(df)$	48.67 (2, 104)***		8.06 (2, 104)***		9.13 (2, 104)***	

Step 1 (not reported in the Table): There was a significant main effect of behavioural difficulties when entered alone, $\beta = .69$, $t_{(106)} = 9.92$, $p < .001$, $R^2 = .48$, $\Delta F_{(1, 106)} = 98.37$, $p < .001$

Step 2 (as reported in the Table): Behavioural difficulties; emotion lability/negativity or emotion regulation; interaction term (all centred on the mean).

^aStudent-Teacher Relationship Scale - short form (STRS-sf, teacher-report), conflict subscale. ^bBehaviour Assessment System for Children-2 (BASC-II), conduct problems subscale; ^cEmotion Regulation Checklist (ERC); ^dInventory of Callous Unemotional Traits (ICU). Significant coefficients at * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4. Regression coefficients and change statistics for predictors of teacher-student closeness^a (*N* = 108)

	Model 1		Model 2		Model 3	
	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>
Behaviour difficulties ^b	-.07	.47	.11	1.51	.39	4.23***
Emotion lability/negativity ^c	-.03	.17	-	-	-	-
Behaviour difficulties * Emotion lability/negativity interaction	.20	1.87	-	-	-	-
Emotion regulation ^c	-	-	.68	9.27***	-	-
Behaviour difficulties * Emotion regulation interaction	-	-	-.11	1.52	-	-
CU traits ^d	-	-	-	-	-.75	8.22***
Behaviour difficulties * CU traits interaction	-	-	-	-	.11	1.44
<i>R</i>²	.03		.49		.42	
ΔR^2	.03		.49		.42	
ΔF (<i>df</i>)	1.76 (2, 104)		50.10 (2, 104)		37.13 (2, 104)***	

Step 1 (not reported in the Table): There was not a significant main effect of behaviour difficulties when entered alone, $\beta = -.01$, $t_{(106)} = .09$, $p < .928$, $R^2 = <.01$, $\Delta F_{(1, 106)} = <.01$, $p < .928$.

Step 2 (as reported in the Table): Behaviour difficulties; emotion lability/negativity or emotion regulation; interaction term (all centred on the mean).

^aStudent-Teacher Relationship Scale - short form (STRS-sf, teacher-report), closeness subscale; ^bBehaviour Assessment System for Children (BASC-II), conduct problems subscale; ^cEmotion Regulation Checklist (ERC); ^dInventory of Callous Unemotional Traits (ICU). Significant coefficients at * $p < .05$; ** $p < .01$; *** $p < .001$.