



# The Social Correlates to Callous-Unemotional Traits in a Sample of High School Students

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Callous-Unemotional (CU) traits are strongly related to early-onset and severe levels of conduct problems. However, much less research has focused on their association with potential problems in adolescents' social relationships. Further, it is important to determine if CU traits explain variance in important social variables, indepen-

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

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

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dent of conduct problems or general personality dimensions related to sociability, like agreeableness. In the current study, we examined the association of CU traits with a range of social variables in a community sample of Italian adolescents ( $N = 563$ ; 460 girls; mean age = 15.80,  $SD = 1.50$ ). Measures for the social variables included assessment of peer rejection, adolescents' prosocial behaviors, satisfaction in peer relationships, and feelings of connection with school and classmates. We also obtained self-report ratings of CU traits, conduct problems (CP) and agreeableness. Analyses showed that CU traits were significantly associated with all the social variables. After controlling for CP and agreeableness, CU traits were still positively associated with ratings of peer rejection and negatively associated with prosocial behavior and satisfaction in relationships with peers. However, the negative associations with feelings of connection to school and peers were no longer significant. These findings provide further support for the clinical usefulness of CU traits and further evidence for potential targets of intervention, particularly focused on the adolescent's relational skills.

**Keywords:** callous-unemotional traits (CU); conduct problems (CP); social relationships; peer problems; adolescents

CALLOUS-UNEMOTIONAL TRAITS (CU traits) describe a specific affective and interpersonal style character-

ized by a lack of empathy, deficient feelings of guilt and remorse, a lack of concern over one's performance in important activities, and shallow and constricted affect (Frick & Ray, 2015). These traits have been studied as the affective component of psychopathy in research on antisocial adults (Hare & Neumann, 2008) and as the affective component of conscience in developmental research with children and adolescents (Kochanska & Thompson, 1997). Recently, CU traits have been increasingly used in research on children and adolescents with behavior problems because they seem to designate a subgroup of children and adolescents with behavior problems (a) who show a particularly severe and aggressive pattern of conduct, (b) who show unique emotional and cognitive correlates to their behavior that could suggest a distinct etiology, and (c) who do not respond as positively to typical mental health treatments (Frick et al., 2014). As a result of their clinical and etiological significance for understanding behavior problems in children and adolescents, they have recently been integrated into the major systems for making conduct problem diagnoses as a specifier to the diagnosis of Conduct Disorder (CD) in DSM-5 (American Psychiatric Association, 2013) and as a specifier to the diagnoses of Conduct-Dissocial Disorder and Oppositional Defiant Disorder (ODD) in the ICD-11 (World Health Organization, 2018).

While a great deal of research has focused on the behavioral, cognitive, and emotional correlates of CU traits, less research has focused on how these traits may be related to the social relationships of children. Two notable exceptions to this are that CU traits have been related to more aggression and bullying behavior towards peers (Ciucci & Baroncelli, 2014a; Ciucci & Baroncelli, 2014b; Golmaryami et al., 2016; Haas et al., 2018) and to more rejection by peers (Graziano et al., 2016; Matlasz et al., 2022; Waller et al., 2017). However, the social correlates to CU traits have not been uniformly negative. For example, CU traits have not been found to be associated with the number of friends the child has, suggesting that children with elevated CU traits may be able to make friends (Muñoz et al., 2008; Waschbusch et al., 2007), although these friends may also engage antisocial behavior (Kimonis et al., 2004). Further, adolescents with CU traits appear to be highly impactful on their peer groups (Kerr et al., 2012; Thornton et al., 2015), suggesting that they possess skills needed to influence their peers. Given research that CU traits are associated with both positive and negative social characteristics, more work is needed

to understand the peer context of children with CU traits.

One area in need of future study is to increase the focus of research on aspects of social behavior that may be especially influenced by the emotional characteristics associated with CU traits. Specifically, prosocial emotions, such as those captured by CU traits, are viewed as important motivators for a child to engage in prosocial behaviors, such as showing sympathy to others or helping others in distress or in need (Frick & Kemp, 2021). Consistent with this possibility, CU traits have been associated with lower levels of cooperation with peers (Hawes et al., 2019; Wagner et al., 2020). Further, although children with elevated CU traits do make friends, the friendships tend to be of shorter duration, more conflictual, and less satisfying to the child (Haas et al., 2018; Muñoz et al., 2008). Finally, CU traits have been associated with less social connection to others, such as feeling isolated and lonely (Haas et al., 2018; Wagner et al., 2020). The limited social connection seems to be especially true for children at school, where CU traits have been specifically associated with less social connections with classmates (Fanti et al., 2017; Haas et al., 2018) and with a lack of concern and indifference about their performance and an insensitivity to punishment and social disapproval (e.g., teacher discipline, peer rejection) (Allen et al., 2018; Hawes et al., 2019). Thus, there are certain social deficits (e.g., low prosocial behavior, reduced relationship quality, poor social connection) that may be more specifically related to CU traits.

This specificity in social deficits relates to the second important way to advance research on the social context of children with elevated CU traits. As noted above, CU traits have been associated with serious antisocial behavior and aggression and such conduct problems have long been associated with problems in peer relationships (Dodge et al., 1990). However, the importance of CU traits as a specifier for conduct problems is that they are only elevated in a subgroup of children with conduct problems and, when present, lead to certain correlates that are not found in other children with conduct problems (Frick, 2022). Stated another way, the importance of CU traits is that they predict clinically or etiologically important variables independent of the severity of conduct problems themselves. Specifically related to social relationships, Matlasz et al. (2022) reported that peer rejection was no longer associated with CU traits when controlling for the level of conduct problems in samples of school children. However, CU traits were independently

associated with peer nominations of being considered mean and cold and with the absence of prosocial behaviors. In a study of 391 students in 5<sup>th</sup> and 6<sup>th</sup> grades, Wagner and colleagues (2020) reported that conduct problems but not CU traits were associated with aggression towards classmates. However, CU traits but not conduct problems were associated with social exclusion and negatively associated with prosocial behavior. Thus, studies on potential social correlates to CU traits need to more consistently determine which associations may be due to and which may be independent of the child's conduct problems.

A final important issue for advancing research on the social context of children with elevated CU traits is to determine if the social problems are more related to broader personality traits. In addition to being integrated into research on childhood psychopathology, CU traits have also been integrated into the theoretical models of normal personality dimensions in youth (Frick & Ray, 2015; Lynam & Miller, 2015). Specifically, research has linked CU traits with several Big Five Personality dimensions (Lynam et al., 2005; Romero & Alonso, 2017), with the most consistent finding being their association with agreeableness (Assary et al., 2015; Essau et al., 2006; Romero & Alonso, 2017; Widiger & Lynam, 1998). Agreeableness refers to the extent to which people are cooperative and are motivated to maintain positive social relationships (Jensen-Campbell et al., 2002). Further, research suggests that agreeableness is negatively related to aggressive and antisocial behaviors (Vize et al., 2018) and positively related to prosocial and empathic behaviors (Graziano & Habashi, 2015; Jensen-Campbell & Graziano, 2001) and peer acceptance (Lopes et al., 2005). Thus, some of the social problems associated with CU traits may be largely due to low levels of agreeableness, although this possibility has not yet been tested.

#### CURRENT STUDY

Based on these limitations in past research, the current study investigated the association between CU traits and measures of peer problems (i.e., peer rejection), as well as measures of prosocial behavior, satisfaction with relationship quality, and feelings of belonging. Past research suggests that CU traits could be particularly influential on these specific aspects of social interactions. Based on prior studies (e.g., Graziano et al., 2016; Matlasz et al., 2022), we predicted that CU traits would be positively associated with our measure of peer rejection but negatively associated with the other

social dimensions (i.e., prosocial behavior, satisfaction with relationship quality, and feelings of belonging). To advance this past work, we tested whether CU traits contribute uniquely to the social dimensions, over and above conduct problems or the level of agreeableness. These two latter constructs are important because they have proven to be related to both CU traits and to problems in social adjustment. To test this aim, we controlled for the youths' level of conduct problems and level of agreeableness. Based on past research (Matlasz et al., 2022; Wagner et al., 2020), we predicted that CU traits would not be related to peer rejection independent of the conduct problems but would still predict the other dimensions of social functioning. Given the absence of past research specifically testing the unique associations of CU traits and agreeableness with social functioning, we did not make a priori hypotheses for these analyses.

#### METHOD

##### *Participants and Procedures*

Five hundred sixty-three Italian high school students in Tuscany, Italy participated in the study (460 females, mean age = 15.8, SD = 1.50). Written informed consent was obtained from parents of students under the age of majority in Italy (i.e., 18 years). For adult students, written informed consent was obtained directly from students. The Institutional Review Board and School Dean approved all procedures. The digitalized survey composing the study measures was administered during one hour of school time using tablets, programmed to not allow for missing items.

#### MEASURES

*CU traits* were assessed using the Italian 22-item version of the Inventory of Callous Unemotional (ICU; Kimonis et al., 2008; Italian version Ciucci et al., 2014). The Italian version removed two items from the original 24-item self-report ICU measure that have shown low item-total correlations across multiple samples (Ciucci et al., 2014). Particularly, the 22-item ICU evaluates a general callous-unemotional factor and three subfactors: callousness (9 items; e.g., "I do not care who I hurt to get what I want"); uncaring (8 items; e.g., "I try not to hurt others' feelings" – reversed) and unemotional (5 items; e.g., "I hide my feelings from others"). Each item is rated on a four-point Likert scale ranging from 0 = "not at all true," to 3 = "definitely true." The ICU items have been found to factor into three subdomains; this factor

structure is invariant for boys and girls (Kliem et al., 2020). However, the items also consistently load on an overarching factor that is captured well by unit weighting of items (Ray & Frick, 2020). Further, the subscales are (a) largely the result of method variance (i.e., positively vs. negatively worded items), (b) their variance is largely due to the overarching factor, and (c) they do not show consistent and theoretically meaningful differential associations with important external criteria (Ray & Frick, 2020). Items have been summed (with negatively-worded items reverse-scored) to create an ICU total score in which a higher score reflects a higher level of CU traits. In support of the validity of self-report total score of the ICU, a recent meta-analysis reported a pooled correlation across 14 effects with measures of externalizing behavior at .47 and a pooled correlation across 8 effects with measures of empathy at  $-.42$  (Cardinale & Marsh, 2020). These pooled correlations were not moderated by the sex composition of the sample. The Cronbach's alpha in the present study was .82 for the ICU total score and McDonald's omega was .82. and the mean item-total correlation was in the acceptable range  $r = .38$ .

*Conduct problems, peer rejection, and prosocial behaviors* were measured using the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 1998; Italian version, Di Riso et al., 2010). The SDQ is a 25-item self-report questionnaire including 5 subscales: *Conduct Problems*, *Peer Problems*, *Prosocial Behaviors*, *Emotional Symptoms*, and *Hyperactivity-Inattention*. Each subscale is composed of 5 items evaluated along a 3-point Likert scale ranging from 1 = "not true" to 3 = "certainly true." Given the purposes of the present study, only the three subscales—Conduct Problems, Peer Problems, and Prosocial Behaviors—were used in data analyses. The Conduct Problems subscale assesses externalizing behaviors (e.g., "I fight a lot. I can make other people do what I want"). The Peer Problems subscale measures social difficulties and peer rejection (e.g., "I am picked on or bullied by other children") and the Prosocial Behaviors subscale assesses the adolescent's engagement in prosocial acts (e.g., "I am helpful if someone is hurt, upset or feeling ill"). The 3 subscales showed only modest internal consistency in the current sample, likely due to the few items assessing each domain: Conduct Problems  $\alpha = .58$ ,  $\omega = .58$ ; Peer Problems  $\alpha = .60$ ,  $\omega = .61$ ; and Prosocial Behaviors  $\alpha = .66$ ,  $\omega = 0.67$ . Importantly, the mean item-total correlation across scales was in the acceptable range: Conduct Problems -  $r = .34$ ; Peer Problems -  $r = .36$ ; and Prosocial Behaviors -  $r = .41$ .

*Agreeableness* was assessed using the Ten-Item Personality Inventory (I-TIPI; Gosling et al., 2003; Italian validation Chiorri, Bracco, Piccinno, Modafferi, & Battini, 2015). The I-TIPI is a 10-item inventory, on which each item is rated on a 7-point scale ranging from 1 = "strongly disagree" to 7 = "strongly agree." In the current study, only the 2-item Agreeableness subscale was used (e.g., "I am a person sympathetic, warm"). The correlation between the two items was .26. The validity of this short subscale has been supported both by previous evidence, showing convergent validity with the Agreeableness subscale from the Big Five Inventory (Chiorri et al., 2015), and by its correlations with Prosocial Behaviors ( $r = .48$ ,  $p < .001$ ) and Positive Relations ( $r = .22$ ,  $p < .001$ ) in the present sample.

*Satisfaction with peer relationships* was assessed using the Ryff's Psychological Well-Being Scale (RPWB; Ryff & Keyes, 1995; Italian version Sirigatti et al., 2009). The PWBS is composed of 18 items that are rated on a 4-point Likert scale ranging from 1 = "strongly disagree" to 4 = "strongly agree." For the purpose of the study, we used the 3-item Positive Relations with Others subscale that describes the adolescent's satisfaction in relationships with others (e.g., "I feel like I get a lot out of my friendship"). The Cronbach's alpha for this subscale was .72 and the McDonald's omega was .74.

*Sense of connectedness* was measured using the Classroom and School Community Inventory (SOC; Rovai et al., 2004). The SOC has two subscales of 5 items each. The first subscale (Sense of Community, Learning) measures the adolescent's feelings of connection to school (e.g., "I feel like I have a lot of learning opportunities in this classroom") and the second (Sense of Community, Social) measures the feelings of connections to classmates (e.g., "I feel like I can rely on others in this classroom"). Each item is rated on a 5-point Likert scale ranging 1 = "strongly agree" to 5 = "strongly disagree." The scores were inversely coded so that higher scores were indicative of a greater sense of community. The Cronbach's alphas in the present study were .88 for the Social subscale and .69 for the Learning subscale, while the McDonald's omega were respectively .88 and .70.

#### OVERVIEW OF THE DATA ANALYSIS

All analyses were conducted using SPSS 27.

First, to verify that the assumptions for the main analyses were met, the study variables' distributions were inspected. Second, to test the associations of CU traits with the social variables

without controlling for conduct problems and agreeableness, we calculated a series of Pearson's correlations. Third, to test the incremental contribution of CU traits to the social outcomes, we performed two sets of hierarchical multiple regression analysis. The first set tested the effects of CU traits on social variables, after controlling for CP. Thus, we ran five hierarchical multiple regressions, one per social outcome, entering sex, age, and CP at step 1, and CU traits at Step 2. The second set of multiple regression analysis tested the effects of CU traits on social variables, after controlling for agreeableness. Thus, we ran another five hierarchical multiple regressions, entering sex, age, and agreeableness at step 1 and CU traits at Step 2.

## Results

### ZERO-ORDER CORRELATIONS

The distribution and correlation among study variables are presented in Table 1. The average mean score for boys on the ICU was 22.05, which corresponds to a T-score of 48 (45 percentile) for boys ages 15–17, and the average mean score for girls on the ICU was 20.53, which corresponds to a T-score of 53 (68 percentile) for girls ages 15–17, based on multinational norms provided on <https://faculty.lsu.edu/pfricklab/icu.php>. Thus, the scores in the current sample appeared to be in the range expected for a nonreferred sample.

As predicated, both conduct problems and CU traits were significantly negatively correlated with the positive peer variables (i.e., Prosocial Behavior, Positive Social Relations, Sense of Community, Social and Learning) and significantly positively correlated with Peer Problems, with correlations ranging from  $-.09$  between CU traits and Sense of Community–Learning and  $-.54$  between CU

traits and Prosocial Behavior. Thus, while all statistically significant, the size of the effects ranged greatly from relatively small effects to fairly large effects.

### INDEPENDENT CONTRIBUTIONS OF CU TRAITS

The results of the first set of multiple regression models testing the effects of CU traits on social outcomes after controlling for conduct problems are presented in Table 2. In these analyses, CU traits significantly predicted the following social outcomes after controlling for conduct problems: Peer Problems, Prosocial Behaviors, and Positive Relations. For these outcomes, CU traits explained an additional 2%, 15%, and 2% of variance, respectively. However, CU traits did not significantly add to the models in which the two social connection (i.e., social and learning) variables were used as dependent variables.

The results of the second set of multiple regression models tested the effects of CU traits on social outcomes, after controlling for agreeableness, and are presented in Table 3. CU traits again explained incremental variance to the prediction of Peer Problems, Prosocial Behaviors, and Positive Relations but not to the two variables measuring social connection. As was the case with the previous regression analyses, CU traits explained a relatively large amount of additional variance for Prosocial Behaviors (12%) but a modest albeit significant amount for Peer Problems and Positive Relations (both 2%).

## Discussion

The present study tested the association between CU traits and several measures of social functioning to determine if CU traits were associated with

Table 1  
Zero-Order Correlations of Study Variables

Demographics	M(SD) or %	Skew.	Kurt	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	11.47(2.26)	–	–								
2. Gender (% female)	460(81.71)	–	–								
<i>Main Study Variables</i>											
3. CP	2.83(1.95)	.70	.04	–	–.52***	.50***	.17***	–.39***	–.22***	–.19***	–.17***
4. Agreeableness	10.05(2.40)	–.43	–.23	–	–	–.48***	–.15***	.48***	.22***	.16***	.11***
5. CU Traits	20.80(8.89)	.39	–.01	–	–	–	.20***	–.54***	–.22***	–.10*	–.09*
6. Peer Problems	1.91(1.75)	1.19	1.43	–	–	–	–	–.17***	–.54***	–.21***	–.10*
7. Prosocial Scale	7.76(1.86)	–.80	.41	–	–	–	–	–	.16***	.11***	.09*
8. Positive Relations	13.34(3.47)	–.60	–.29	–	–	–	–	–	–	.32***	.17***
9. SoC Social	15.08(4.81)	–.08	–.83	–	–	–	–	–	–	–	.51***
10. SoC Learning	1571(3.04)	–.20	–.27	–	–	–	–	–	–	–	–

Note. CU = callous–unemotional; CP = conduct problems; SoC = Sense of Community; Gender coded as: 0 = male, 1 = female.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

Table 2  
Results of Hierarchical Regression Analyses

	Peer Problems		Prosocial Behaviors		Positive Relation		SoC Social		SoC Learning	
	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$
Gender	.22(.18)	.04	-.50(.18)	-.10**	.87(.37)	.10**	.43(.51)	.03	-.11(.32)	-.01
Age	.08(.05)	.07	.06(.04)	.05	-.25(-.10)	-.11*	-.64(.13)	-.20***	-.32(.08)	-.16***
CP	.15(.04)	.17***	-.37(.04)	-.39***	-.40(.07)	-.22***	-.46(.10)	-.19***	-.26(.06)	-.17***
R <sup>2</sup>	.03***		.16***		.06***		.07***		.05***	
Gender	.19(.19)	.04	-.40(.17)	-.08*	.93(.36)	.10*	.44(.50)	.04	-.10(.32)	.01
Age	.08(.05)	.07	.04(.04)	.03	-.25(.09)	-.11**	-.64(.01)	-.20***	-.32(.08)	-.16***
CP	.09(.04)	.10*	-.16(.04)	-.17***	-.26(.08)	-.15***	-.44(.11)	-.18***	-.25(.07)	-.16***
CU Traits	.03(.01)	.15**	-.09(.01)	-.45***	-.06(.02)	-.15***	-.01(.03)	-.02	-.01(.02)	-.02
R <sup>2</sup>	.05**		.31***		.08**		.07***		.05***	
$\Delta R^2$	.02*		.15***		.02***		.00		.00	

Note. *b* = unstandardized beta coefficient; SE = standard error;  $\beta$  = standardized beta coefficient; CP = conduct problems; CU traits = callous-unemotional traits; SoC = Sense of Community

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

Table 3  
Results of Hierarchical Regression Analyses

	Peer Problems		Prosocial Behaviors		Positive Relation		SoC Social		SoC Learning	
	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$	<i>b</i> ( <i>SE</i> )	$\beta$
Gender	.22(.19)	.50	-.48(.18)	-.10**	.86(.37)	.10*	.40(.51)	.03	-.13(.32)	-.02
Age	.07(.05)	.06	.10(.05)	.08*	-.21(.10)	-.09*	-.61(.13)	-.19***	-.31(.09)	-.15***
Agreebl.	-.11(.03)	-.14***	.37(.03)	.48***	.31(.06)	.21***	.30(.08)	.15***	.13(.05)	.10*
R <sup>2</sup>	.02***		.24***		.06***		.06***		.03***	
Gender	.19(.19)	.04	-.40(.16)	-.08*	.92(.37)	.10*	.42(.51)	.03	-.11(.33)	-.01
Age	.08(.05)	.06	.07(.04)	.06	-.23(.10)	-.10*	-.62(.13)	-.19***	-.31(.09)	-.15***
Agreebl.	-.05(.04)	-.07	.22(.03)	.29***	.20(.07)	.14**	.25(.09)	.13**	.09(.06)	.07
CU Traits	.03(.01)	.16***	-.08(.01)	-.39***	-.06(.02)	-.16***	-.02(.03)	-.04	-.02(.02)	-.06
R <sup>2</sup>	.04***		.36***		.08**		.06***		.03***	
$\Delta R^2$	.02***		.12***		.02***		.00		.00	

Note. *b* = unstandardized beta coefficient; SE = standard error;  $\beta$  = standardized beta coefficient; CP = conduct problems; CU traits = callous-unemotional traits; SoC = Sense of Community; Agreebl. = agreeableness.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

important interpersonal outcomes, independent of conduct problems and agreeableness, in a relatively large sample of nonreferred adolescents. In general, with the exception of the measure of the connectedness to school and classmates, CU traits explained unique variance after controlling for conduct problems and agreeableness. These findings suggest that CU traits provide important information for understanding problems in adolescents' social relationships that can't be explained by co-occurring problems in adjustment or normal personality traits.

Specifically, and consistent with past research, our findings suggest that CU traits are associated with being isolated and rejected from peers (Graziano et al., 2016; Matlasz et al., 2022;

Waller et al., 2017). More important for advancing this past work, our results indicate that this peer rejection could not be solely explained by the child's level of conduct problems. This is an important finding that has implications for the use of CU traits in diagnostic classification systems as a specifier for conduct problem diagnosis. That is, these findings suggest that CU traits are related to clinically important outcomes (i.e., problematic peer relationships) that are not solely explained by the severity of conduct problems.

CU traits were also associated with several other indicators of problems in social relationships. Specifically, they were associated with less prosocial behaviors with peers and with less satisfaction in peer relationships. The finding of CU

traits being related to less prosocial behaviors (e.g., helping others in distress) is consistent with developmental theories suggesting that prosocial emotions, like empathy and guilt, serve to motivate the individual to engage in prosocial behaviors (Frick & Kemp, 2021). The findings that CU traits are related to less satisfaction in their peer relationships suggest that, while persons with CU traits may be able to make friends with deviant peers (Muñoz et al., 2008), these relationships are less positive and satisfying to the adolescent (Haas et al., 2018; Wagner et al., 2020). Of note, these associations with prosocial behaviors and relationship satisfaction were significant, controlling for both conduct problems and agreeableness. Thus, while CU traits are associated with this personality dimension that defines traits related to a person's motivation to engage in and maintain positive interpersonal relationships (Assary et al., 2015; Essau et al., 2006; Romero & Alonso, 2017; Widiger & Lynam, 1998), CU traits contribute to problems in peer relationships that cannot simply be explained by variations in these personality traits.

One aspect of social relationships that CU were related to, but not independent of conduct problems and agreeableness, was the adolescent's feelings of connection to school and classmates. CU traits were related to feelings of connection (negatively) in zero order correlations, as would be expected from past research (Fanti et al., 2017; Haas et al., 2018). However, these associations were no longer significant when controlling for conduct problems or agreeableness. Our main analyses did not allow us to determine which of these covariates may be better for explaining variance in school connectedness, since these two variables were not entered into the regression models together. However, in post hoc analysis (Table A1 in supplementary materials), when both variables were entered together, only conduct problems remained significantly associated with feelings of connection to school and classmates. This finding illustrates the importance of teasing apart the potential influences on adolescents' interpersonal functioning by suggesting that it is the adolescent's behavior problems that are most influential in determining whether the youth feels emotionally connected at school.

All of these results need to be interpreted in light of several limitations. First, students came from a single cultural context (i.e., an Italian school system) and this prevents us from generalizing our results to other countries and cultures. Second, the cross-sectional nature of our study prevents us from making both temporal and causal

interpretations from our results. That is, we have offered hypotheses to suggest that CU traits can lead to impairments in interpersonal relationships, but it is also possible that being rejected by peers increases tendencies to be callous towards others. Third, all of our variables relied on adolescent self-report. This was done because parents and teachers may become less aware of a child's conduct problems as they enter adolescence, especially those that occur with peers (e.g., fighting) and those of a covert nature (e.g., lying and stealing). Further, a recent study by Matlasz, Frick, and Clark (2023) specifically compared the validity of parent, teacher, and self-report ratings of CU traits across three age ranges and reported that, by the eighth grade, only self-report ratings had substantial validity. Nevertheless, it is important to note that youth may be reluctant to report on the full extent of their conduct problems. Fourth, we outlined clear theoretical reasons for testing whether or not CU traits added to the prediction of social difficulties when controlling for conduct problems and agreeableness. However, it is important to note that there are other personality (e.g., neuroticism) and problems in adjustment (e.g., ADHD) that could contribute to a child's social difficulties that should be considered in future research.<sup>1</sup> Fifth, the SDQ was designed as a brief screening measure and, as a result, the subscales are very brief. This results in very modest internal consistency of these subscales. Despite the brevity, the SDQ is widely used in research worldwide with substantial support for the validity of its subscales (Ortuño-Sierra et al., 2015; Van Roy et al. 2008). However, it will be important to replicate our results using more extended measures of conduct problems and relationships with peers.

Despite these limitations, our results suggest that CU traits are associated with several different problems in adolescents' interpersonal relationships. They are associated with being rejected by peers, with showing less prosocial behaviors towards others, with being less satisfied with peer relationships, and with feelings of being less connected with school and classmates. With the exception of feelings of connection, these other problems in peer relationships could not be solely explained by CU traits' association with conduct

<sup>1</sup> We did conduct post-hoc analyses (see Table B1 in supplementary materials) that repeated the analyses reported in Table 2 after controlling for the Hyperactivity-Inattention subscale of the SDQ. The inclusion of this subscale did not substantially alter the findings, with CP remaining significantly associated with all dependent variables and CU traits remaining positively associated with peer rejection and negatively associated with prosocial behaviors and peer relationship satisfaction.

problems or the normal personality dimension of agreeableness. Thus, CU traits are associated with clinically important aspects of social relationships that cannot be accounted for by extremes of normal personality traits. Further, it supports their use as a specifier for the diagnosis of conduct disorder, given that they predict important social variables independent of conduct problem severity. These findings suggest that treatments for adolescents with CU traits need to consider these social deficits.

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