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ABSTRACT

Objective: Callous-unemotional traits (CU) traits are characterized by low empathy, guilt, and reduced sensitivity to others' feelings, along with a reduced drive for social affiliation. However, little is known about the relationships between CU traits and social affiliation in the school context, or the influence of gender on these associations. This study tested reciprocal associations between CU traits and school-based affiliative relationships and explored gender as a potential moderator.
Method: The sample included South Korean children aged 10 to 12 years (N = 218, M = 11.03, SD = .65, 52% boys). Children reported on CU traits, antisocial behavior, teacher-student relationship quality, and peer affiliation. Three-wave longitudinal cross-lagged models tested reciprocal associations between CU traits and affiliation with both teachers and peers, with multi-group modeling employed to test the moderating effect of gender.
Results: Higher CU traits at time 1 predicted decreases in teacher affiliation at time 2 controlling for CU traits, teacher-child affiliation, and antisocial behavior at time 1, while lower teacher-child affiliation at time 2 predicted increases in CU traits at time 3 accounting for CU traits, teacher-child affiliation, and antisocial behavior at time 2. However, there were no reciprocal associations between CU traits and teacher affiliation nor significant associations between CU traits and peer affiliation. Gender did not moderate any pathways between CU traits and teacher or peer affiliation.
Conclusions: Findings indicate CU traits may reduce teacher-child affiliation, potentially escalating risk for further increases in CU traits. Thus, teacher-child affiliation may represent an important target for school-based intervention for children with elevated CU traits regardless of gender.

Children's development is shaped through repeated, reciprocal transactions with their social context (Nigg, 2006). Children are intrinsically motivated to seek affiliative rewards and form attachment bonds with others. However, there are individual differences in sensitivity to affiliation, with individuals high on psychopathic traits showing motivational deficits in affiliation (Waller et al., 2020a). Callous-unemotional (CU) traits represent a developmental precursor of the affective component of adult psychopathy (i.e., low empathy, lack of caring, insensitivity to others' emotions) (Waller et al., 2020b) and an important specifier for childhood conduct problems predicting persistent antisocial behavior across different developmental stages (Frick et al., 2014). Moreover, evidence suggests that these traits and various social factors (e.g., parenting practices, caregiver warmth) may shape one another through bidirectional transactions that play out across development (Hawes et al., 2011). Although an extensive body of research has demonstrated that children with CU traits exhibit a distinct temperamental profile,

including reduced sensitivity to social cues, such as distress or fear (Frick et al., 2014), the role of reduced drive for affiliative reward and atypical social affiliation has received less attention. In particular, very little is known about CU traits and affiliation outside of the family context, despite the established influence of teachers and peers on children's social development from early childhood onwards (Howes, 2000).

An emerging body of research has indicated that CU traits are associated with poor quality teacher-child relationships (Allen et al., 2018; Crum et al., 2016). To date, however, only one study has examined the directionality of this association. Specifically, Baroncelli and Ciucci (2020) found that higher teacher-child affiliation was related to reductions in CU traits over 6 months among 11–13-year-old children (N = 301), while CU traits were not significantly related to teacher-child affiliation. This finding suggests that teachers may play a vital role in promoting emotional socialization, even when children have characteristics (i.e., CU traits) that might otherwise negatively impact their relationships

with others. In contrast, qualitative studies suggest that teachers perceive fewer reward-based strategies as effective for children high in CU traits (Allen et al., 2016, 2018), and longitudinal research in the current sample found that CU traits were related to teachers reducing their use of rewards over time (Hwang et al., 2020). Teachers' less frequent use of rewards and greater use of harsh discipline may elicit poor quality of teacher-child affiliation (De Jong et al., 2014), and have shown significant associations with CU traits (Allen et al., 2018). Teacher classroom management strategies and teacher-child affiliation are interlinked, with positive teacher-child relationships promoting child compliance and thereby reducing the need for discipline, while conversely the effective implementation of classroom management strategies helps to promote teacher-child affiliation (Allen et al., 2018). However, they are distinct constructs that reflect different dimensions of the teachers' role. Teacher reward and discipline strategies are considered part of the professional dimension, aimed at supporting students to regulate their behavior and classroom engagement, while teacher-child affiliation relates to the social dimension, and is defined by the degree of emotional distance between teachers and students (De Jong et al., 2014; Mainhard et al., 2011). Thus, research is needed to clarify the relationship between teacher-child affiliation and CU traits accounting for teacher's use of classroom management strategies.

In terms of peer relations, some studies have demonstrated that CU traits are not significantly associated with peer affiliation once behavior problems (i.e., aggression, impulsivity) are considered (Haas et al., 2011; Pardini & Fite, 2010). However, other studies support the unique contribution of CU traits to disrupted peer affiliation (Miron et al., 2020; Waller et al., 2017). These studies have varied significantly in informant (youth, parent, or teacher report) and measurement approach to assess peer relations (scale/nomination, dislike/like/friendship quality), making it challenging to interpret the mixed findings. Moreover, most prior studies have been cross-sectional, therefore the directionality of relationships cannot be confirmed. However, two prior longitudinal studies suggest that higher levels of peer affiliation may be protective against CU traits, including when peer affiliation is indexed via higher friendship quality (Miron et al., 2020) and peer support (Fanti et al., 2017). Nevertheless, further research is needed to clarify longitudinal relationships between CU traits and peer affiliation.

Gender is also known to have a critical influence on social affiliation. In typically developing children, there is a female advantage for both teacher (Koepke & Harkins, 2008) and peer affiliation (Fanti et al., 2017). There are also known gender differences in the severity

and comorbidity of CU traits. For example, boys have more severe CU traits and antisocial behavior, while girls have more severe internalizing symptoms (Fanti et al., 2017). The correlates of CU traits that differ by gender include increased biological risk factors (Loney et al., 2006), emotion deficits (Stickle et al., 2012), and poor academic performance in Science for boys (Bird et al., 2019). These differences may place boys with elevated CU traits at higher risk for low affiliations with teachers and peers. However, research has yet to examine the potential moderating effect of gender on reciprocal affiliative interaction between teacher and peers and CU traits.

The current study seeks to address these gaps in the literature by examining reciprocal associations between CU traits and two types of affiliation (i.e., teacher and peer), as well as examining gender as a potential moderator of these associations. Investigating potential reciprocity between CU traits and relational processes is likely to provide useful information for interventions targeting teacher and peer relationships. We focused on early adolescence because during this developmental stage children begin to seek more independence from their families, coupled with greater self-consciousness and concern about peer approval (Giordano, 2003). Moreover, research on teacher-child affiliation during this stage has been particularly limited compared to early childhood. We hypothesized that there would be reciprocal associations between CU traits and social affiliation over and above concurrent levels of antisocial behavior. We predicted that these associations would be moderated by gender, such that CU traits would be more strongly associated with low social affiliation among boys than girls.

Method

Participants

Participants were 218 primary school students in grades 5 and 6 from a south-eastern urban city of South Korea (population ~around 2.5 million). At the baseline assessment (T1), participants included 113 boys and 105 girls aged 10 to 12 years ($M = 11.03$, $SD = .65$). All participants were Korean and a small proportion were eligible for free school milk (10%). Only 17 children (8%) reported living with a single parent, largely consistent with the 9% reported single parent family rate in South Korea (Statistics Korea, 2017). Participants were asked to complete two follow-up assessments. At time 2 (T2), the number of participants was 215 (98.6%; 112 boys, 103 girls) and at time 3 (T3) the number of participants was 213 (97.7%; 109 boys, 104 girls). In total, 211

participants (96.8%; 108 boys, 103 girls) were retained and there were no significant differences between the final participant group (n = 211) and those who missed at least one assessment (n = 7) on demographic characteristics and study variables (range, t = −2.32 − 1.44, all ps > .05).

Procedure

The study was approved by the university ethics board. Invitation letters were sent to school principals, with two different schools agreeing to participate. The parents of students in Grade 5 and 6 in these schools were then sent an information letter including research aims and procedures. Only the 218 students out of 274 with parental consent to their participation (80%) were approached for the assessment. Child assent was obtained on the day of the first assessment. All 218 children agreed to participate in the study and completed the questionnaires in their classroom during regular lesson time; no specific incentives were offered for participation. Data collection took place at three time-points. The first assessment was conducted at the start of the new academic year and two follow up assessments were conducted at approximately 4.5-month intervals. The same classroom teacher taught every subject to each class throughout the entire year, ensuring that children reported on their relationship with same teacher at each assessment point.

Measures

Callous-Unemotional Traits

We assessed CU traits at all three time-points using 9 items from the revised University of New South Wales (UNSW) index (Dadds et al., 2005). These 9 items tapped into the presence of callousness and a lack of guilt (e.g., I am helpful if someone is hurt, upset or feeling ill', "I feel bad or guilty when I do something wrong"), with each item rated on a 3-point scale from 0 (not true) to 2 (certainly true). The original UNSW CU traits index has been shown to exhibit high reliability and construct validity (Hawes et al., 2019) and has been used to validate other measures of CU traits (Hawes et al., 2020). In the current sample, the psychometric properties and construct validity of a revised 9-item CU traits scale were established in a prior study using confirmatory factor analysis (see Hwang et al., 2020, 2021; T1, α = .78; T2, α = .81; T3, α = .81).

Antisocial Behavior

We assessed child antisocial behavior at each time point using a revised 9-item version of the UNSW antisocial behavior index (Hwang et al., 2020). The revised version of the UNSW antisocial behavior index included items assessing aggression and externalizing problems (e.g., "I fight a lot", "I take things that are not mine from home, school or elsewhere"). Children rated items on a 3-point scale ranging from 0 (not true) to 2 (certainly true). The reliability and construct validity of the revised antisocial behavior scale was established in a prior study using the same sample, showing significant correlations with both CU traits and teacher harsh discipline (Hwang et al., 2020; T1, α = .88; T2, α = .90; T3, α = .92).

Teacher-Child Affiliation

We assessed child perceptions of the positive affective quality of the teacher-child relationship using the affection subscale of the Quality of the Student-Teacher Relationship Scale (QSTR; Davis, 2001). Six items are rated on a 5-point scale from 1 (never true for me) to 5 (always true for me) (e.g., "My teacher understands me", "I like my teacher") across all three time-points. Higher scores indicate greater trust and positive emotions toward their teacher. The scale has shown significant relationships with student's perceptions of the classroom climate and academic achievement (Davis, 2006). Scale internal consistencies were high at all time points (T1, α = .83; T2, α = .82; T3, α = .91).

Peer Affiliation

We assessed child peer acceptance using a sociometric nomination procedure. Children were asked to nominate the classmates with whom they most liked to spend time. The number of nominations that children received were standardized within the classroom to represent the level of peer acceptance. This approach produces a reliable and valid assessment of peer acceptance, with scale scores showing significant relations with positive teacher-child relationships and academic skills (Kiuru et al., 2015).

Teacher Classroom Management Strategies

We also assessed child perceptions of teacher strategies using the classroom discipline strategies questionnaire (Lewis, 2001) at the first assessment. Five items were rated on a 5-point scale from 1 (never) to 5 (always) to assess teacher's use of reward in response to child prosocial behavior and task engagement (e.g., "praises the class for good behavior"). The harsh discipline dimension consisted of 5 items that assess teacher's use of harsh discipline in response to child misbehavior (e.g., "yells angrily at students who misbehave"). The reliability and construct validity of the reward and harsh discipline scales have been supported, showing significant associations with students' affect toward the teacher (Lewis et al., 2008). The internal consistency for the scales in the

current sample was acceptable for both reward (α = .70) and harsh discipline (α = .75) dimensions.

Demographic Information

Children reported on their age and gender at the first assessment and their teacher reported on child family structure and eligibility for free school milk.

Data Analysis

Primary analyses were conducted using the statistical software program R (R Core Team, 2013). Given the low attrition rate (i.e., 3.2%), selective attrition analyses were not conducted (Fewtrell et al., 2008). First, to explore reciprocal associations between CU traits and social affiliation in school over time, we tested separate autoregressive cross-lagged models for teacher and peers. We included pathways from antisocial behavior at all time-points to establish unique associations between social affiliation and CU traits and within-time correlations between all variables. All indirect pathways accounted for the temporal ordering of main study variables. We also included pathways from the following demographic covariates to all variables: age, single parent status, and free school milk. Given significant associations between teacher-child affiliation and teacher's use of reward and harsh discipline, we also included teacher's use of classroom management strategies as covariates in the teacher-child affiliation model to assess the specific association of CU traits with teacher-child affiliation. Second, to examine whether gender moderated the associations between CU traits and social affiliation, we used multi-group modeling. Specifically, we compared the fit of an unconstrained model where all paths varied between boys and girls, with the fit of a constrained model in which paths were fixed to be equal between groups. To test for potential differences in specific pathways, we also compared the fit of the

constrained model with the fit for a series of models where individual paths were selectively freed. We compared model fit using the Satorra-Bentler-corrected Chi-Square difference test. The current sample was nested within 11 classrooms, which is considered too few for multilevel modeling, thus we controlled for potential clustering effects by including dummy codes for each classroom in all models (Schunck, 2016).

Results

Descriptive statistics are presented in Table 1 and bivariate correlations between all study variables in Table 2. Analysis of variance (ANOVAs) were used to examine differences between study variables over time. The means indicated moderate stability over time, although with several exceptions. Both CU traits and teacher-child affiliation at T1 were significantly higher than at T3, while peer affiliation at T1 and T2 were significantly lower than peer affiliation at T3 (Bonferroni corrected, ps < .05). Within-measure stability was moderate-to-high across time points in bivariate correlations. Higher CU traits were significantly and moderately related to lower teacher-child affiliation at all time points. Teacher-child affiliation showed significant positive associations with teacher rewards, and negative associations with teacher harsh discipline at all time points. Higher CU traits at T1 and T2 were moderately correlated with lower peer affiliation at T2, but not at other time points. Higher antisocial behavior was also correlated with lower teacher-child affiliation at all time points, but only significantly related to lower peer affiliation at T3. Finally, there were expected significant positive correlations between CU traits and antisocial behavior both cross-sectionally and longitudinally across all time points.

In the cross-lagged model for teacher-child affiliation accounting for teacher's use of reward and harsh discipline, higher CU traits at T1 predicted decreases in

Table 1. Descriptive statistics for the sample.

Variable	N	M	SD	range	skewness	kurtosis
			Time 1			
Antisocial behavior	213	2.59	2.47	0– 17	1.72	5.39
Callous-unemotional traits	214	6.68	3.01	0– 18	.17	.39
Teacher-child affiliation	213	25.45	3.89	8– 30	−1.03	1.44
Peer affiliation	218	1.73	1.49	0 – 6	.72	−.22
			Time 2			
Antisocial behavior	211	2.83	2.50	0– 13	1.24	1.67
Callous-unemotional traits	215	6.25	2.84	0– 13	.06	−.68
Teacher-child affiliation	214	25.19	4.06	10– 30	−1.13	1.37
Peer affiliation	215	1.92	1.60	0 – 6	.61	−.49
			Time 3			
Antisocial behavior	211	2.72	2.30	0– 10	.83	.30
Callous-unemotional traits	211	5.92	2.95	0– 16	.07	−.39
Teacher-child affiliation	212	24.33	4.32	10– 30	−.85	.71
Peer affiliation	214	2.41	1.74	0 – 7	1.01	2.33

Table 2. Bivariate cross-sectional and longitudinal correlations among study variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Gender																	
2. Single parent	−.01																
3. Free school milk	.13*	.41**															
4. Age	−.01	−.07	−.04														
5. Teacher reward strategies	.10	−.04	−.03	−.11													
6. Teacher harsh discipline	−.11	.03	−.00	.21**	−.25**												
7. Antisocial behavior T1	−.22*	.13	.05	.10	−.07	.37**											
8. Antisocial behavior T2	−.13	.26**	.24**	.04	−.16*	.27**	.51**										
9. Antisocial behavior T3	−.21**	.15**	.10	.05	−.18**	.27**	.59**	.66**									
10. CU traits T1	−.17*	−.04	−.03	.03	−.20**	.09	.20**	.22*	.18*								
11. CU traits T2	−.27**	−.01	.01	.09	−.13	.00	.20**	.26**	.24**	.59**							
12. CU traits T3	−.33**	.04	.06	.09	−.20**	.16*	.20**	.27**	.30**	.46**	.66**						
13. Teacher affiliation T1	.06	.01	.01	−.06	.50**	−.39**	−.26**	−.25**	−.26**	−.32**	−.20**	−.28**					
14. Teacher affiliation T2	.06	−.04	−.02	−.04	.36**	−.25**	−.33**	−.36**	−.30**	−.30**	−.32**	−.37**	.58**				
15. Teacher affiliation T3	.05	−.02	.08	−.09	.23**	−.27**	−.24**	−.27**	−.29**	−.26**	−.28**	−.30**	.42**	.60**			
16. Peer affiliation T1	.22**	−.01	.05	.14*	.05	.11	−.05	−.03	−.08	−.06	−.08	−.01	.06	.08	.01		
17. Peer affiliation T2	.12	−.02	.04	.07	.01	.17*	−.10	−.07	−.07	−.17*	−.17*	−.04	−.01	.09	.08	.53**	
18. Peer affiliation T3	.16*	−.01	−.03	−.02	.10	.05	−.08	−.13	−.14*	−.10	−.10	−.07	.05	.10	.07	.44**	.58**

CU traits = Callous-unemotional traits. T1 = Time 1; T2: Time 2; T3 = Time 3. *p < .05. **p < .01.
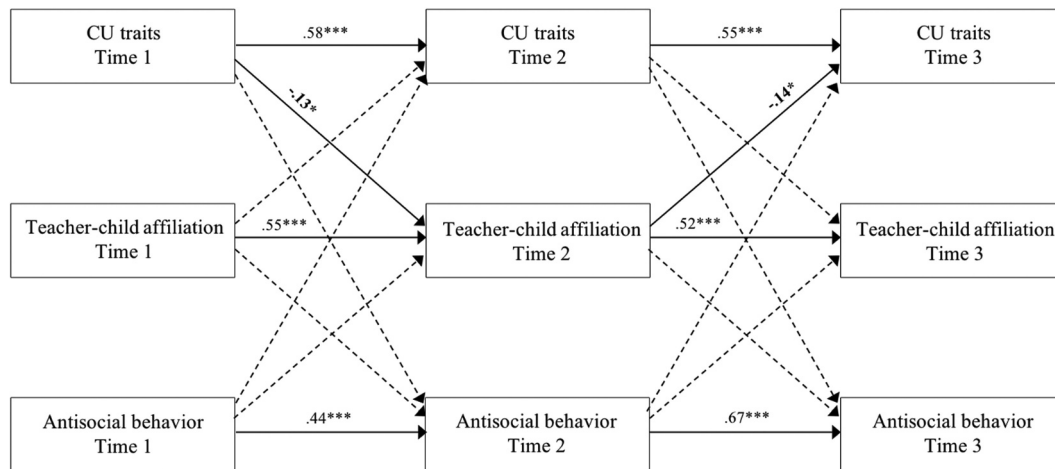
Figure 1. Cross-lagged model among CU traits, teacher-child affiliation, and antisocial behavior at T1-T3. Standardized coefficients are presented. Dashed lines indicate non-significant pathways. Teacher's use of rewards and harsh discipline, child age, family type, free school milk, and classroom effects were entered as covariates, but are not shown in the figure. CU traits = Callous-unemotional traits. *p < .05, ***p < .001.

teacher-child affiliation at T2, while lower teacher-child affiliation at T2 predicted increases in CU traits at T3 (Figure 1). In the peer model, there were no significant associations between CU traits and peer affiliation. All estimates of pathways including concurrent covariances between variables in cross-lagged models are presented in the supplementary materials (Tables S1 and S2).

We next explored the potential moderating effect of gender by testing multi-group models to compare boys (n = 108) and girls (n = 103). For the teacher model, a fully freed model fit the data better than a model in which parameters were held to be equal between groups (Fully freed model: $\chi^2(178)$ = 485.26, AIC = 10752.9, BIC = 12256.2; Fully fixed model: $\chi^2(280)$ = 669.21,

AIC = 10732.8, BIC = 11909.9; $\Delta\chi^2(102)$ = 162.49, p < .001). That is, the overall model fit differently among boys versus girls. However, when we tested for differences at the individual pathway level, there were no significant differences for any pathways between teacher-child affiliation and CU traits over time (Table S3). Likewise, for the peer model, although the fully freed model showed a significantly better fit than a model in which the parameters were fixed between boys and girls (Fully freed model: $\chi^2(136)$ = 307.89, AIC = 4673.0, BIC = 5986.9; Fully fixed model: $\chi^2(235)$ = 496.42, AIC = 4669.5, BIC = 5674.3; $\Delta\chi^2(99)$ = 171.20, p < .001), none of the pathways between peer affiliation and CU traits differed by gender (Table S4).

Discussion

This is the first study to examine longitudinal bidirectional relationships between CU traits and affiliative relationships with both teachers and peers, and to test the moderating effect of gender on these associations. We also controlled for antisocial behavior to establish any unique associations between CU traits and social affiliations over time. Longitudinal associations between teacher-child affiliation and CU traits were supported even within the relatively brief period of one school year, such that CU traits elicited decreased affiliation in the teacher-child relationship, which in turn, was related to increased levels of CU traits. Unlike a previous study of middle school children that only found a significant effect of teacher-child relationship quality on CU traits, but not vice versa (Baroncelli & Ciucci, 2020), our results are suggestive of some dynamic reciprocity in the unfolding of teacher-child relationships over time in the context of CU traits, consistent with theories emphasizing the interactive nature of social affiliation (Waller & Wagner, 2019). Differences, such as the intensity and duration of teacher-child interaction (i.e., 6 vs. 9 months, middle school teachers who taught one subject vs. primary school teachers who taught most subjects) and considered covariates (i.e., exclude vs. include of teacher use of strategies) may explain differences between our findings and those of Baroncelli and Ciucci (2020). Although we found that the overall model fit differed by gender in both the teacher and peer models, there were no significant differences for any of the specified pathways between CU traits and social affiliation with teachers or peers. Thus, our findings suggest that both boys and girls benefit equally from high quality teacher-child relationships, with positive teacher-child affiliation leading to reductions in CU traits over time similarly across gender.

However, there were gender differences for other pathways, such as the stability of antisocial behavior between T1 and T2 (teacher model boys, β = .64, $p < .001$ and girls, β = .13, $p = .316$; peer model boys, β = .68, $p < .001$ and girls, β = .18, $p = .207$). Although most research on the stability of antisocial behavior has focused on males in Western countries (Moffitt et al., 2001), extant research suggests similar stability and trajectories of antisocial behavior for boys and girls (Piquero et al., 2012). However, girls are significantly less likely to be classified into a high and stable antisocial behavior group and twice as likely to be associated with a non-aggressive group compared to boys (Harachi et al., 2006). Furthermore, antisocial behavior problems are less frequent and severe for East Asian children compared to Western children (Le & Stockdale, 2005).

Although one study found no significant differences in the trajectory of externalizing problems in Chinese boys and girls aged 3 to 6 years old (Bao et al., 2016), to date no studies have investigated gender differences in the stability of antisocial behavior in Asian countries. Although this question was not central to our study goals, our results highlight the differential stability of antisocial behavior among boys versus girls in Asian countries as an important area for future research.

In the current study, peer affiliation was not significantly associated with CU traits. Findings for peer affiliation have been less consistent than for teacher affiliation, including studies reporting no association with CU traits (Haas et al., 2011; Pardini & Fite, 2010) consistent with the current findings, but others found a significant association (Miron et al., 2020; Waller et al., 2017). Past studies have differed in the measures of peer affiliation used, making it challenging to determine the reason for the inconsistent findings. Being liked versus disliked by peers is often viewed as an inversely correlated measure. However, one prior study found that psychopathic traits were associated with peer dislike, but not peer liking controlling for their correlates (Piatigorsky & Hinshaw, 2004). Future research could include both peer like and dislike nominations to address this issue, and a further index, such as peer rejection or friendship quality.

We used peer report to assess peer acceptance, which is considered a gold standard in peer experience research given that peer interaction often occurs beyond the view of adults (Wagner et al., 2020). Our finding that there was no relationship between CU traits and peer affiliation is consistent with a past study that employed peer nomination (Haas et al., 2011), but differs from other studies employing different informants, such as child self-report (Miron et al., 2020) or teacher report (Waller et al., 2017). Different informants may contribute unique information, so future studies should include a multi-informant approach. Another explanation for our findings concerns cultural differences. South Korea's culture values reticence, which may influence the expression of personal desires (Hart et al., 2000). As such, South Korean children may be less willing to express their preferences, producing restricted variability in the range of peer acceptance levels. Peers may also play a less significant role in East Asian cultures, as studies of East Asian children have not found a significant association between CU traits and deviant peer affiliation (Ang et al., 2015; Chu et al., 2014), whereas there is consistent support for this link in Western samples (Backman et al., 2018). More research is needed to compare Western and Asian countries to provide a better understanding of the implications of

cultural differences regarding CU traits and social affiliation (Sng et al., 2020).

The current findings should be interpreted in the light of several limitations. First, we relied on child report for both CU traits and teacher-child relationship quality, which may lead to shared method variance. Further, the differing perspectives of multiple informants who interact with the child in different contexts can provide useful information (Kraemer et al., 2003; Makol et al., 2020). For example, child covert and deceitful antisocial acts, especially those associated with CU traits, may not be detected by adult informants. The associations between child and teacher report of antisocial behavior and CU traits were moderate in the current sample (Hwang et al., 2020, 2021), consistent with previous research on child behavior problems (e.g., Dadds et al., 2011, 2018; Gresham et al., 2010). In addition, the affective quality of teacher-child affiliation may be appraised differently by children depending on their temperament characteristics. Because of their reduced motivation for and enjoyment of social affiliation, children with elevated levels of CU traits may be more likely to report disrupted teacher-child affiliation, even when their teacher displays warmth toward them. Furthermore, including parent perspectives (i.e., including informants from both home and school contexts) could provide additional meaningful information that informs school-based intervention (De Los Reyes et al., 2019).

Second, although we examined the moderating effect of gender, the nature of these relationships may be more complex. We did not consider the gender of either the teacher or rater of peer nomination. Most teachers in our study were female (81.80%). The predominance of female teachers may be a risk factor for male students, as female teachers report greater closeness to female students (McGrath & Van Bergen, 2015). Similarly, there is evidence that the association between antisocial behavior and peer acceptance depends on gender matching and gender role norms, such that girls' aggressive behavior predicted greater liking by boy peers, but not girl peers (Smith et al., 2010). Although we were underpowered to do so in the current study, future studies capable of assessing gender matching in social interactions would help to draw a more nuanced picture of the relationships between CU traits and affiliation in the school context.

Third, our findings may not generalize to clinic settings where children show higher levels of antisocial behavior and CU traits and lower levels of affiliation with teachers and peers. In addition, our participants were all South Korean, limiting the generalizability of findings to other cultures, particularly given evidence for

cultural variation in the manifestation of CU traits and antisocial behavior (Fung et al., 2009; Le & Stockdale, 2005). For example, one study found that parents in Hong Kong reported higher levels of child CU traits than parents of children in the USA (Fung et al., 2009), while another found that Chinese and English children systematically gave higher or lower ratings for questionnaire items assessing CU traits, likely due to differing cultural norms (Allen et al., 2020). Antisocial behavior has also been relatively less of a problem in Asia compared to Western countries (Shwalb et al., 2009). In fact, one study conducted in four different countries found that individualism was related to higher child delinquency, while collectivism was related to lower delinquency (Le & Stockdale, 2005). Interestingly, a recent study in adults from English-speaking Western and East Asian Chinese-speaking cultures suggested the potential universality of the psychological processes underlying psychopathy in relation to cultural values and thinking styles, although psychopathic traits showed negative associations with collectivism, but positive associations with individualism (Shou et al., 2019). However, research has yet to explore the psychological processes underlying differences in the manifestation and correlates of CU traits in different cultures in children. The nature of teacher-child affiliation may also differ across Western and East Asian nations, with several studies finding better quality teacher-child relationships in collectivistic cultures than individualistic cultures (Chen et al., 2019; Jia et al., 2009; Yang et al., 2013). Therefore, caution must be taken before generalizing the current findings to Western cultures. Finally, we did not have any information about children from whom parents did not provide informed consent for their participation (20%). There may be important differences between children who did and did not participate, potentially resulting in a biased sample.

Our findings support theories of CU traits highlighting the importance of affiliation in the development of CU traits (Waller & Wagner, 2019). Findings indicate that positive teacher-child relationships play an important role in the development of CU traits, even when this relationship is concentrated within a relatively short time frame. The results suggest that promoting the quality of teacher-child relationships is a potential target for individualized school-based intervention for children with CU traits, regardless of gender. We did not find any significant association with peer affiliation, suggesting that intervention efforts may be better directed toward teacher-child interaction. Previous studies have found significant associations between CU traits and other dimensions of teacher-child interaction (i.e., teacher use of reward and discipline strategies; Allen et al.,

2016, 2018; Hwang et al., 2020) or peer affiliation (i.e., friendship quality; Miron et al., 2020). As the current study is first to examine bidirectional associations between CU traits and social affiliation with both teachers and peers, future longitudinal research including multi-informant, multimethod assessment of peer and teacher relations across different periods of schooling is needed to increase our understanding in this domain.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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