RUNNING HEAD: Prosociality, Affiliative Behaviors, and CU traits

Why should I? Examining how childhood callous-unemotional traits relate to prosocial and affiliative behaviors and motivations

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Abstract

Childhood callous-unemotional (CU) traits are characterized by low empathy, limited prosocial behavior, and restricted social affiliation. However, few studies have investigated whether CU traits are associated with different subtypes of prosocial and affiliative behavior or the specific motivational difficulties underlying these behaviors. We addressed these questions using data from 135 children (*M*=5.48 years old; 58% female) who viewed depictions of adults or children in instrumental need, emotional need, or neutral situations. We assessed recognition, suggested initiation of, and motivation for prosocial or affiliative behavior in response to each depiction. We distinguished between subtypes of prosocial (instrumental and emotional) and affiliative (parallel, cooperative, associative) behavior, as well as self- versus other-orientated motivations. Parents reported on child CU traits and conduct problems. Overall, children accurately recognized prosocial and neutral situations, offered help, and expressed other-orientated motivations for prosocial behavior and social motivations for affiliative behavior. Higher CU traits were related to lower overall recognition accuracy, which was more pronounced for emotional need. Higher CU traits were also related to fewer offers of help and more denial of prosocial behavior, particularly for instrumental need. Finally, CU traits were related to lower probability of initiating affiliative behavior. CU traits were not differentially related to self- versus other-orientated motivations for prosocial or affiliative behavior. Findings demonstrate difficulties of children with CU traits in recognizing need and offering help. Interventions for CU traits could include modules that explicitly scaffold and shape prosociality and social affiliation.

Keywords: callous-unemotional traits; conduct problems; motivation; prosocial behavior; social affiliation.

Callous-unemotional (CU) traits are characterized by low empathy, limited prosociality, and restricted motivation for or enjoyment of social bonding with others (i.e., affiliation) (Frick et al., 2014; Viding & McCrory, 2019; Waller et al., 2020; Waller & Wagner, 2019). CU traits distinguish children at risk for severe conduct problems (CP) (Hawes et al., 2017; McMahon et al., 2010; Neo & Kimonis, 2021), which confer vast economic costs through health, justice, and school expenditures (Rivenbark et al., 2018; Romeo et al., 2006) and cause harm to victims, parents, teachers, and communities. A better understanding of the mechanisms that contribute to the development of CU traits, including prosocial and affiliative processes, can inform more effective tailored interventions to prevent chronic CP across childhood and adolescence.

Prosociality and CU traits

Prosociality emerges in the second year of life and increases in frequency and variety throughout childhood (Brownell, 2013; Paulus, 2018). During early childhood, prosociality is classified as helping (i.e., alleviates instrumental need for goal-directed behavior), comforting (i.e., alleviates emotional distress), or sharing (i.e., alleviates resource needs) (Brownell, 2013; Dunfield & Kuhlmeier, 2013). There is moderate convergence between subtypes of prosocial behavior (Newton et al., 2016; Paz et al., 2023; Schachner et al., 2018), but also evidence for their distinctiveness in form (Dunfield, 2014; Paulus et al., 2015) and development (Paulus, 2018). Prosociality is motivated to promote another person's well-being (i.e., other-oriented, such as empathy) or an individual's own well-being (i.e., self-oriented motivation, such as obtaining material or social reward) (Barnett & Thompson, 1985; Eisenberg et al., 2016).

The literature on CU traits and prosociality is both fundamentally tautological and surprisingly scant. Tautologically, low prosociality defines CU traits, including within the "limited prosocial emotions" specifier for the diagnosis of conduct disorder (American

Psychiatric Association, 2013). Thus, CU traits are often measured by inversely scoring items assessing prosociality (Frick, 2004) or "hybrid measures" that combine scales assessing CU traits and prosociality (Hawes & Dadds, 2005; Waller et al., 2015). Meta-analytic findings revealed an association of ρ=-.66 between report measures of CU traits and prosociality, which dropped to ρ=−.49 following correction for attenuation, suggestive of significant variability in convergence of the two constructs (k=19, N=12,082; Waller et al., 2020). Moreover, children with CU traits have difficulty recognizing distress expressed by others and show reduced neural reactivity to such cues (Blair et al., 2014), which would otherwise promotes motivational processes for other-oriented prosociality (Eisenberg et al., 2016). Thus, there is at least moderate conceptual overlap and potential circularity inherent in the very question of how CU traits relate to prosociality.

However, we need more granular investigations of prosociality to gain insight into the core difficulties of children with CU traits, including variability in the contexts for behavior, prosociality subtypes, and assessment methods, all of which could impact purported associations. Studies have typically used report measures of CU traits and prosociality, largely relying on the same informant for each, which inflates the magnitude of effects due to shared method variance. Report measures of prosociality are also limited by social desirability, halo, and central tendency effects (El Mallah, 2020; Keefer et al., 2013). Alternative methods are well-established in the developmental literature, including observational lab-based paradigms in young children that standardize the elicitation of prosocial responding (Svetlova et al., 2010; Vaish et al., 2009; Warneken & Tomasello, 2006), naturalistic observations of the frequency of prosociality (Dahl, 2015; Strayer & Roberts, 2004), and vignette-based picture tasks depicting individuals in need of help and recording verbal responses of children (Funk et al., 2003; Litvack-Miller et al., 1997; Roberts et al., 2020; Yarrow et al., 1973). Prior studies also use picture tasks to assess prosocial

motivation (Bar-Tal et al., 1981; Barnett & Thompson, 1985), though by assessing children's perceptions of other people's motivations rather than their own (Flavell & Miller, 1998).

Studies that leverage task-based paradigms could provide greater insight into links between CU traits and children's propensity and motivation for prosociality. In prior studies, CU traits in adolescents were linked to less costly offers of monetary help (Sakai et al., 2019) and less cooperation in online games (Hawes et al., 2019), while observed instrumental helping at age 2 was unrelated to CU traits at age 4 (Peltola et al., 2018). Other prior studies have investigated broad indices of prosociality (i.e., "volunteers to help others"; Goodman, 1997), rather than different subtypes or motivations for prosociality, which could show differential links to CU traits, including children with CU traits being selectively prosocial for self-serving motivations. A thorough examination of children's offers of prosociality using a vignette-based task, which differentiates between instrumental or emotional helping and isolates the underlying motivations for prosociality, can inform a better understanding of the mechanisms underlying CU traits and identify novel intervention targets (Brazzelli et al., 2021; Shin & Lee, 2021).

CU traits and affiliative behavior

Affiliation difficulties are also central to the etiology of CU traits (Viding & McCrory, 2019; Waller & Wagner, 2019). Affiliation refers to wanting and maintaining close social relationships (Depue & Morrone-Strupinsky, 2005; Waller & Wagner, 2019). The construct is rooted in motivational theories (Scheffer & Heckhausen, 2018) and represents a biological disposition underpinned by genetic and neural architectures traceable to our evolution as social beings (Schultheiss & Wirth, 2018). Affiliation is operationalized in adults as the need for affiliation (Friis & Knox, 1972; Shipley & Veroff, 1952), affiliation motivation (Hill, 1987), agreeableness (Graziano & Eisenberg, 1997), and communion (Leary, 1957). Studies have linked

low affiliation to CU traits in children aged 3-10 years old using questionnaires (Domínguez-Álvarez et al., 2021; Perlstein et al., 2023). Laboratory studies have also linked CU traits in young children to fewer displays of affection (Dadds et al., 2012; Waller et al., 2016), less social imitation and engagement (Wagner et al., 2020), and lower eye contact (Dadds et al., 2012, 2014). Finally, CU traits have been linked to difficulties responding to affiliative signals during adolescence, including positive emotion and laughter (Fanti et al., 2016; O'Nions et al., 2017).

However, we need methods that directly assess children's affiliative behavior, including affiliation in seemingly neutral situations (Over, 2016; Scott et al., 2014). Here, affiliation can be inferred from a willingness to initiate social interaction, including parallel (i.e., independent but alongside), associative (i.e., interactive without shared goals), or cooperative (i.e., interactive with a shared goal) interactions (Dyer & Moneta, 2006; Parten, 1932). This distinction is well-established in the context of play, where parallel play precedes the development of more complex forms of social or cooperative play, which in turn predicts positive outcomes and an enjoyment of social relationships later in life (Garaigordobil, 2014; Jaggy et al., 2023). However, no prior studies have explored individual differences in how children respond to seemingly neutral situations as an index of affiliative behavior. Examining motivations for affiliation could generate new insights into how affiliative difficulties shape risk for CU traits.

The current study

Our goal was to explore links between CU traits and prosocial and affiliative behavior. We developed a new task assessing children's verbal responses to depictions of adults and children in instrumental or emotional need, as well as neutral situations. We focused on middle childhood (i.e., ages 5-6) coinciding with the start of formal schooling, which precipitates new social experiences relevant to prosociality and affiliation, with implications for the emergence of

psychopathology (Hwang et al., 2021; Rose-Krasnor, 1997). First, we examined recognition of prosocial need, prosocial offers (instrumental or comforting), and prosocial motivations (self- or other-oriented), as well as links to CU traits. We hypothesized that CU traits would be related to worse recognition of need, fewer prosocial offers, and more self-oriented motivation. Second, we explored whether children recognized the neutral situations (i.e., no help needed), their offers of affiliative behavior (parallel, cooperative, or associative), and their motivations (i.e., social- or non-social reward), as well as links to CU traits. We hypothesized that CU traits would be related to intact recognition of neutral situations, fewer affiliative behavior offers, and if offers were made, fewer social motivations. Finally, we examined how age and gender related to outcomes. CU traits are typically higher in boys (Essau et al., 2006), whereas girls are more prosocial (Eisenberg et al., 2015) and affiliative (Schrepferman et al., 2006). Hence, we hypothesized that girls would make more prosocial and affiliative behavior offers. In terms of age, prosociality increases across childhood, which is attributed to increasing sociocognitive skill (Eisenberg et al., 2015; Malti & Dys, 2018). However, age effects vary for different prosociality subtypes, inclduing evidence for increases in comforting and sharing, but not instrumental helping, in early childhood (Paz et al., 2023), and increased sharing in middle childhood (Eisenberg et al., 2015). Given our early childhood sample, we did not anticipate age effects for prosocial behavior offers, though hypothesized that older children would show better recognition of prosocial need. Likewise, since play becomes more cooperative over development (Anderson-McNamee, 2010), we hypothesized that older children in our sample would offer more cooperative social bids.

Methods

Participants

Participants were 135 children aged 5-6 (*M*=5.48, *SD*=.50; 57.8% female) and their

parents, recruited from Philadelphia. Most parents (97% mothers) were married to or cohabiting with the other biological parent (76%). The sample was racially diverse (46% White, 35% Black, 13% Asian) and 6.5% of the children also identified as Latinx. More than half of parents (52.2%) had a graduate degree, 34.5% had a Bachelor's degree, 2.7% had an Associates qualification, and 10.7% had a high school qualification or less. While the average monthly household income was $10,253 (*SD*=8,742), 20.2% of the sample reported an annual income that fell below the median for area households based on census report (U.S. Census Bureau., 2019).

Procedures

Participants were recruited through Facebook, flyers posted in community locations (e.g., daycares and grocery stores), and an institutionally-maintained database of families who had expressed interest in research participation. Interested families were directed to an online survey asking for basic demographic and contact information. Families completed a phone screen. We excluded children diagnosed with a learning or developmental disorder or who were receiving treatment for a mental health problem. Parents and children participated in a 45-minute Zoom visit hosted by a research assistant. We obtained informed consent from the parent (electronic signature) and verbal assent from the child. Parents sat beside children but were instructed not to respond to stimuli or the child's responses. After the visit, parents were sent a Qualtrics link to complete questionnaires. Families were compensated with a $35 Amazon voucher. Study procedures were approved by the Institutional Review Board at the University of Pennsylvania.

Measures

Eliciting Children's Helping Offers (ECHO) task (**Figure 1**). Children were presented with 14 depictions of children or adults in instrumental need (4 images, 2 child and 2 adult; e.g., girl trying to reach a toy), in emotional distress (4 images, 2 child and 2 adult; e.g., boy crying

over a skinned knee), or in a neutral situation (6 images, 2 child and 4 adult; e.g., man playing a guitar). In each case, children were asked, "what is happening in the picture?" (*recognition*), "what would you do if you were there with them?" (*behavior offered*), and "what would happen after?" (*motivation*; i.e., inferred from the outcome benefiting the depicted actor or child). Images were presented onscreen and questions were read by a research assistant. A neutral situation was always depicted first but otherwise the order was randomized (see **Table S1** and **Supplemental Methods** for coding details; see **Figure S1** for details about stimuli validation).

To address our first aim, we coded children's responses to the prosocial images: (1) Accurate recognition of need for help (0=no, 1=yes), (2) Offer of help (0=no, 1=yes), (3) Denying help after recognizing need (0=no, 1=yes), (4) Subtype of help offered (instrumental, 0=no, 1=yes; comforting, 0=no, 1=yes), and (5) Motivation (0=neither other- or self-orientated; 1=self-oriented, 2=other-oriented). To address our second aim, we coded children's responses to neutral images: (1) Accurate recognition that it was neutral situation with no emotional or instrumental need (i.e., 0=no, 1=yes), (2) Offer of affiliative behavior (0=no, 1=yes), (3) Subtype of affiliative behavior offered (0=none, 1=parallel, 2=associative, 3=cooperative), and (4) Motivation (0=non-social reward, 1=social reward). Zoom videos were recorded and coded later. Inter-rater reliability was calculated on a random 20% of videos, with acceptable-to-high reliability for both the prosocial (*range,* κ=.73-94) and neutral (*range,* κ=.75-91) images.

Callous-Unemotional (CU) Traits. We used parent reports on 22 of the 24-item Inventory of Callous-Unemotional Traits (ICU; Frick, 2004), which has been validated in early childhood, *range,* α=.79–.85 (Benesch et al., 2014; Kimonis et al., 2016). The ICU assesses callousness (e.g., "concerned about feelings of others"), uncaring (e.g., "feels bad or guilty"), and unemotionality (e.g., "expresses feelings openly"), with items rated on a 4-point scale (0=*not*

at all true, 3=*definitely true*). We used a summed total score of items (α=.83).

Conduct Problems. We used parent reports on the 5-item CP scale of the validated Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997, 2001; *range,* α =.60 –.74), which assesses behavior problems and rule-breaking (e.g., "lies or cheats"), with items rated on a 3-point scale (0=*not true*, 2=*certainly true*). We used a summed total score of items (α=.75). We included CP as a covariate to isolate the specificity of results to CU traits rather than CP severity.

Covariates. We controlled for demographic factors reported by parents: child gender (0=male, 1=female), child age (*M*= 71.2 months, *SD*=6.44), parent education (1=less than high school diploma, 6=graduate degree; *M*=5.16, *SD*=1.18), and number of children (i.e., siblings) living in the household (*M*=2.06, *SD*=2.06).

Analytic Strategy

Analyses were conducted using mixed-effect linear models in R (R Core Teams, 2020) using the following packages: tidyverse for data organization (Wickham et al., 2019), lme4 for mixed-effect logistic regression (Bates et al., 2014), brms for multinomial mixed effect models (Bürkner, 2017) and sjPlot and ggplot2 for visualization (Lüdecke, 2022; Wickham, 2016). To address our first aim on prosociality, we explored links between responses and task factors (type, actor age), controlling for child age and gender. We ran mixed effects logistic regressions with response as the dependent variable (e.g., offer help, no=0, yes=1), which was regressed on need type (instrumental=-.5, comforting=.5), actor age (adult=-.5, child=.5) and child age and gender, including a by-participant random intercept, by-participant random slope for need type, and by-scenario intercept. Next, we entered centered CU traits and CP scores, as well as interactions between CU traits and need type. To examine prosocial motivations, we specified a multinomial mixed effect model with motivation type as the dependent variable and the same steps as above.

Main analyses were run using the full sample but results were similar after we excluded trials when children failed to recognize need or after excluding trials when children had not offered help (see **Supplemental Materials**). To address our second aim, we followed similar steps, using mixed effects logistic regression for recognition, initiation, and motivation of affiliative behavior, and multinomial mixed effect models for type of affiliative behavior initiated. For both aims, as an exploratory analysis, we explored interactions of gender and CU traits to test for moderation. De-identified datasets, analysis scripts, and task stimuli at: osf.io/26rtw/?view_only=e8377234b2ef44709b61b5fa0d32204a.

Results

Descriptive statistics and zero-order bivariate correlations between study variables are presented in **Tables S2** and **S3**. Correlations between the total scores for prosocial and affiliative behavior codes are presented in the **Supplementary Material**.

Recognition, offers, and motivation for prosocial behavior

For prosocial recognition, children showed high overall accuracy (*M*=7.48, *SD*=.96, 93.5% of trials), with a main effect of subtype (*B*=5.08, *SE*=1.42, *OR*=12.66 *p*<.001; 95% CI=3.16, 50.78; **Table 1**). Children were better at recognizing emotional (*M*=3.89, *SD*=.37, 92% of trials) than instrumental need (*M*=3.58, *SD*=.76, 72% of trials). Older children showed higher recognition accuracy (*B*=1.30, *SE*=.48, *OR*=1.91, *p*=.01; 95% CI: 1.19, 3.07), though actor age was unrelated to recognition of need (*B*=-.27 *SE*=.61, *p*=.67) (**Table 1**). For prosocial offers, accuracy was associated with more prosocial offers (*r*=.71, *p*<.001) and no children made prosocial offers without having correctly identified need. Overall, children made prosocial offers in 84% of trials (*M*=6.91, *SD*=1.75) and 89.9% of trials when need was recognized. There was no overall effect of subtype on prosocial offers, though children were more likely to deny help in

response to emotional need (i.e., fail to offer help despite having accurately recognized need; *B*=2.73, *SE*=1.16, *OR*=3.91 *p*=.02; 95% CI=1.26, 12.18) (**Table 1**). Likewise, when we only included trials when need for help had been correctly recognized, children were more likely to offer instrumental help (**Table S4**). Overall, actor age predicted help denial (*B*=-.87, *SE*=.44, *OR*=.65, *p*=.03; 95% CI=0.44, 0.95), with children less likely to offer help to adult (88% of trials) than child (93% of trials) actors. Finally, children predominantly made prosocial offers that matched actor need (92% of trials). In the 8% of mismatched trials, 92% of the offers were instrumental in response to an emotional need. For prosocial motivation, children provided more other-oriented (31% of trials; e.g., "they will feel better") than self-oriented (20% of trials; e.g., "they will thank me") motivations for prosociality ($t(130)=2.56$, $p=.01$), which was more pronounced for emotional need (*B*=1.13, *SE*=.34, *OR*= 1.78, *p*<.01; 95% CI=1.32, 2.46; **Table 2)**. See **Table S5** for similar findings when we only analyzed trials after help was offered.

Callous-unemotional traits and prosociality

CU traits were associated with lower recognition accuracy for prosocial need (*B*=-.16, *SE*=.04, *OR*=.35, *p*<.001; 95% CI=.19, .62; **Table 1**) and fewer prosocial offers (*B*=-.12, *SE*=.03, *OR*=.44, *p*<.001; 95% CI=.28, .68; **Table 1**), including when models only included trials preceded by correct recognition (**Table S4**). CU traits were unrelated to prosocial motivation (**Table 2**). There was an interaction between CU traits and need type (*B*=-.15, *SE*=.08, *OR*=.59, *p*=.045; 95% CI=.35, .99), such that CU traits were associated with poorer recognition of emotional (β=-.23, *p*<.01) versus instrumental (β=-.08, *p*=.03) need (**Table 1, Figure 2a**). CU traits did not interact with need type for prosocial offers. However, there was an interaction between CU traits and need type for help denial (*B*=-.13, *SE*=.06, *OR*=.64, *p*<.01; 95% CI=.42, .98), with CU traits related to greater help denial for instrumental (β=.21, *p*<.01) versus

emotional (β =.08, p=.07) need (**Table 1, Figure 2b**). Moderation analysis revealed that CU traits were more strongly related to poorer prosocial need recognition and fewer helping offers among boys (**Table S6; Figure S2**). In contrast to CU traits, CP were related to *better* prosocial need recognition (*B*=.39, *SE*=.18, *OR*=1.73, *p*=.03; 95% CI=1.06, 2.80), but were unrelated to prosocial offers. However, CP were unrelated to recognition when CU traits were removed from the model (*p*=.24) and there was no interaction between CU traits and CP (**Table S7**).

Recognition, offers, and motivation for affiliative behavior

Children showed high overall accuracy for recognizing neutral social situations (i.e., actors had no instrumental or emotional need; *M*=5.61, *SD*=.79; 93.5% of trials). Children made affiliative offers for 78.2% of trials (*M*=4.69, *SD*=1.65). There was a main effect of actor age (*B*=.68, *SE*=.25, *OR*=1.38, *p*<.01; 95% CI=1.10, 1.73), such that children were more likely to make affiliative offers to child (*M*=.83, *SD*=.31, 83.2% of trials) versus adult (*M*=.74, *SD*=.33, 75.8% of trials) actors (**Table 3**). Across a handful of trials (5.4%), children made affiliative offers after incorrectly recognizing emotional need. Results were unchanged excluding these trials (**Table S8**). For the type of affiliative offers made, children offered more cooperative (52% of trials; e.g., "we will play together") than parallel (34% of trials: e.g., "I'll watch a different movie next to them") or associative (14% of trials; "I will watch the movie too") interactions ($F(2,260)=41.50$, $p<.001$; all *post hoc* comparisons significant after Bonferroni correction, $p<.001$). Actor age did not predict the type of affiliative behavior offered (**Table S9**), but older children suggested more cooperative interactions (*B*=.83, *SE*=.34, *OR*=1.51, *p*=.02; 95% CI=1.10, 2.12). Girls offered more parallel than cooperative interactions (*B*=-.70, *SE*=.35, *OR*=.71, *p*=.04; 95% CI=.51, .97; **Table S9**). Finally, children expressed social motivations in 25% of trials. Children were more likely to express social motivations for child than adult actors

(*B*=.74, *SE*=.27, *OR*=1.42, *p*<.01; 95% CI=1.10, 1.82; **Table 3**), including when models only included motivation trials following affiliative offers (**Table S10**).

Callous-unemotional traits and affiliative behavior

CU traits were unrelated to recognition accuracy for neutral situations (*B*=.05, *SE*=.04, *p*=.22). However, higher CU traits were related to fewer affiliative behavior offers overall across cooperative, associative, and parallel interactions (*B*=-.08, *SE*=.03, *OR*=.55, *p*=.01; 95% CI=.36, .85; **Table 3**), but were not differentially related to fewer offers of any one type (**Table S9**). CU traits were unrelated to different motivations for affiliative behavior (**Table 3**). In contrast to CU traits, CP were related to poorer *recognition* of neutral social situations (*B*=-.42, *SE*=.18, *OR*=.56, *p*=.02; 95% CI=.34, .92). This effect remained significant even when CU traits were not included in the model and there was no significant interaction between CU traits and CP (**Table S7)**. Unlike CU traits, CP were unrelated to affiliative behavior offers (*B*=.04, *SE*=.15, *p*=.82).

Discussion

We examined children's prosocial and affiliative recognition, offers of behavior, and motivation, as well as links to CU traits. Overall, children accurately recognized prosocial need and offered help. Children were better at recognizing emotional than instrumental need, in line with evidence that children orient to others' distress from very young ages (Davidov et al., 2021; Roth-Hanania et al., 2011). Even after correctly recognizing need, children denied help more for emotional cues. This finding echoes work showing that young children struggle to help those in emotional need, which may be an overly arousing context that makes prosociality costly, with young children too dysregulated by others' distress to offer comfort (Eisenberg et al., 2015; Newton et al., 2016). In contrast, instrumental help may be "easier" because it is more practical, consistent with evidence of greater frequency of instrumental helping in young children (Paz et

al., 2023; Schachner et al., 2018; Svetlova et al., 2010). This point is supported by our finding that mismatched trials were mostly offers of instrumental help for emotional need. Indeed, when children made prosocial offers following emotional cues, the motivation expressed was also other-oriented (Davidov et al., 2021; Knafo et al., 2008). Notably, while children helped both child and adult actors, they helped children more and denied help more to adults. Few studies have compared helping behavior directed to different-aged actors (Carlo & Padilla-Walker, 2020), despite evidence that actor characteristics impact the prevalence and mechanisms of helping (Coyne et al., 2017; Eisenberg & Fabes, 1998; Fortuna & Knafo, 2014). Future studies are needed to evaluate whether helping peers more reflects greater familiarity with the needs of other children, less experience helping adults, or perceived social threat from adults in need.

Children also showed high recognition accuracy for neutral situations. Our findings echo established biologically driven affiliative tendencies of humans (Depue & Morrone-Strupinsky, 2005), with children consistently offering to engage socially with actors. The predominance of cooperative interactions, particularly among older children, is consistent with literature identifying cooperative play as more developmentally advanced (Anderson-McNamee, 2010) and important to social competence and problem-solving across the lifespan (Rose-Krasnor, 1997; Rubin et al., 1984). As with prosocial need, children made more affiliative offers to child actors. Notably, children responded similarly to our online prosocial and affiliative cues as observed during in-person studies (Dunfield & Kuhlmeier, 2013; Giner Torréns & Kärtner, 2019; Schachner et al., 2018). Thus, our task shows promise as an accessible and brief tool to identify children with difficulties recognizing the needs of others or making helping or affiliative offers.

In line with hypotheses, children with higher CU traits showed poorer recognition of prosocial need and made fewer prosocial offers. Post hoc analyses revealed these effects were

driven by the boys in our sample, which may be partly explained by the higher rates of CU traits in males (Essau et al., 2006) and different early socialization patterns of girls and boys (Hastings et al., 2007). Our multi-dimensional approach to prosociality allowed us to demonstrate that CU traits were more strongly associated with poorer recognition of emotional need, despite emotional need being recognized with greater accuracy overall in our sample. Poor recognition of emotional need tracks with established emotion recognition difficulties among children with CU traits, particularly for distress cues (Bedford et al., 2015; Blair et al., 2014; Powell et al., 2023). Interestingly, even after correctly recognizing prosocial need, children with high CU traits were more likely to deny help, particularly for instrumental need. One explanation for this finding is that even though instrumental situations do not necessarily signal overt distress in the same way as emotional need, such situations could still provoke physiological arousal (Hepach et al., 2012). Children high on CU traits show disrupted arousal and regulation in response to social (Perlstein, et al., 2021) and distress (Fanti et al., 2016) cues. Thus, even when children with CU traits correctly recognize that someone needs help, they may lack the motivation to act because the situation is not as inherently arousing to them (i.e., "knowing but not feeling") (Jones et al., 2010). One implication is that treatments for CU traits could target both emotion and need recognition, as well as strongly rewarding prosocial behaviors (Baumsteiger, 2019; Hunnikin et al., 2022) Such efforts would require additional scaffolding and rewards to overcome social motivational difficulties associated with CU traits. Notably, CP were correlated with better recognition of prosocial need and worse recognition of neutral situations, which might reflect unique variance in CP not related to CU traits, such as greater threat sensitivity (Mills-Koonce et al., 2015). However, the effect was not significant for prosocial need when we did not covary for CU traits, suggestive of a cooperative suppression effect (i.e., statistical artifact).

We also found that children higher on CU traits made fewer affiliative offers. While our operationalization of affiliative behavior was children offering social actions in neutral social situations, our findings are consistent with prior studies linking low social engagement (Waller et al., 2021) and less social imitation (Wagner et al., 2020) to early CU traits. Similarly, work in older children and adolescents has linked CU traits to difficulties responding to positive emotion and laughter in others (Fanti et al., 2016; O'Nions et al., 2017) and social bonding difficulties with peers and teachers (Hwang et al., 2021). Thus, our results add to research that emphasizes disruptions in affiliative processes as central to the development of CU traits (Viding & McCrory, 2019; Waller & Wagner, 2019). At the same time, affiliative difficulties represent a transdiagnostic marker for different forms of psychopathology (Palumbo et al., 2022). Thus, studies need to isolate affiliation mechanisms that are disrupted in developmental pathways to CU traits, including testing the possibility that children with CU traits do not initiate affiliative interactions because they do not find social relationships rewarding (Viding & McCrory, 2019), whereas children with anxiety or depression may have intact motivation for or anticipate social reward, but do not initiate affiliative interactions because of difficulties enacting those intentions (Coplan et al., 2004) or withdrawing from others to avoid rejection (Gilboa-Schechtman, 2020).

Our results should be interpreted in the context of several limitations. First, we assessed prosocial and affiliative behaviors from children saying what they *would* do, rendering our approach indirect relative to observations of real-world behavior and more susceptible to social desirability effects (Strayer & Roberts, 2004). Second, our motivation measure was derived from children's expectations of the consequences of the behavior they offered. Future studies could address this issue by using experimental settings to operationalize different motivations (Vaish et al., 2009) or asking direct questions about motivations (Smiley & Dweck, 1994). Third, sharing

represents a third prosociality subtype (Brownell, 2013; Dunfield & Kuhlmeier, 2013) that we could not code in our task, but warrants investigation in relation to CU traits. Fourth, our data collection was forced online as the COVID-19 pandemic prohibited in-person visits. This approach may have benefited families of young children for whom an online study was more accessible. However, parental proximity may have influenced children's task responses, while children's responses and/or the context of COVID-19 may likewise have impacted parents' later questionnaire ratings. We sought to minimize this effect by instructing parents to "not respond to stimuli on the screen or their child's answer". However, future studies are needed that replicate our findings with data collected during typical in-person visits. Finally, we recruited a community sample with low levels of CU traits and CP and high levels of parental education. To increase generalizability, future research needs to replicate findings among more representative samples with a greater range in socioeconomic position, educational attainment, and/or in clinic-referred samples with more severe CP.

In sum, we extend knowledge about how CU traits are related to difficulties in recognizing, enacting, and being motivated for prosocial and affiliative behaviors. Study strengths include assessment of children's perspectives about what and why they would act in prosocial and neutral contexts. Results provide a fine-grained perspective on the mechanisms underlying the prosocial difficulties that define CU traits, emphasizing that children with CU traits had difficulties in both recognizing need and offering help, struggling with the aspects of prosociality that are considered "easier" for young children in general. More, children with CU traits were less willing to initiate affiliative behaviors in neutral contexts, which provides insight into the social bonding difficulties that appear characteristic of the CU traits phenotype.

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Table 1. Mixed-effect logistic regression analyses examining whether CU traits and conduct problems predicts recognition of others' need for help and help offering

Predictor	*Prosocial recognition*						*Help offering*						*Denial of help (not offering even after accurately recognizing need)*					
	Model 1			**Model 2**			**Model 1**			**Model 2**			**Model 1**			**Model 2**		
	B	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*
Need type	5.08	1.42	< .001	2.54	1.16	.03	-.10	.50	.846	.09	.51	.85	2.73	1.16	.019	2.62	1.02	.01
Actor age	-.27	.61	.67	-.29	.54	.59	.11	.37	.757	.17	.37	.65	-.87	.39	.026	-.86	.39	.03
Child age	1.30	.48	.01	1.10	.45	.01	.92	.41	.026	.65	.39	.10	-.41	.48	.397	-.21	.49	.66
Child gender	.71	.46	.12	.64	.43	.13	.37	.41	.357	.34	.40	.39	-.27	.48	.573	-.06	.50	.90
CU traits				-.16	.04	<.001				-.12	.03	<.001				.14	.05	.002
Conduct problems				.39	.18	.03				.23	.16	.14				.05	.19	.80
Need type x CU traits				-.15	.08	.045				-.01	.03	.73				-.13	.06	.04

Notes.Need type was coded: instrumental=-0.5 and emotional=0.5. Actor age was coded: adult=-0.5 and child=0.5. Child gender was coded male=0 and female=1. Findings for CU traits were unchanged when CP were not included (**Table S11**) and after controlling for parental education and number of siblings (see OSF). The association between higher conduct problems and better recognition of prosocial need became non-significant when CU traits were removed from the model (see https://osf.io/26rtw/?view_only=e8377234b2ef44709b61b5fa0d32204a). Results from examining interactions with gender are presented in **Table S6** and **Figure S2.**

Table 2. Multinomial mixed linear regression analyses examining whether CU traits and conduct problems distinguish between motivation for help

Predictor	*Self vs. Other-oriented*						*Neither motivation vs. Self-oriented*						*Neither motivation vs. Other-oriented*					
	Model 1			**Model 2**			**Model 1**			**Model 2**			**Model 1**			**Model 2**		
	B	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*	*B*	*SE*	*p*
Need type	1.13	.34	<.001	1.23	.34	<.001	-.32	.26	.23	-.41	.30	.17	.87	.30	.01	.88	.30	.01
Actor age	.24	.33	.49	.18	.35	.61	.57	.27	.03	.60	.29	.004	.76	.29	.01	.72	.31	.02
Child age	.14	.57	.83	.25	.59	.69	.80	.37	.03	.58	.38	.14	.88	.53	.10	.81	.55	.14
Child gender	.39	.57	.51	.52	.59	.39	-.52	.36	.15	-.72	.41	.08	-.13	.53	.98	-.13	.55	.81
CU traits				.04	.05	.42				-.07	.03	.05				-.01	.04	.82
Conduct problems				.04	.23	.87				-.16	.16	.31				-.11	.21	.59
Need type x CU traits				.08	.04	.05				-.04	.03	.26				.05	.03	.10

Notes. Need type was coded: instrumental=-0.5 and emotional=0.5. Actor age was coded: adult=-0.5 and child=0.5. Child gender was coded male=0 and female=1. Results were largely unchanged when we controlled for parental education and number of siblings. Gender did not moderate the main effect of CU traits (see https://osf.io/26rtw/?view_only=e8377234b2ef44709b61b5fa0d32204a).

Table 3. Mixed-effect logistic regression analyses examining whether CU traits and conduct problems predicts recognition of neutral situations and initiation and motivation for affiliative behaviors

	Recognition of neutral situation						*Initiation of affiliative behavior*						*Motivation for affiliative behavior*					
	Model 1			**Model 2**			**Model 1**			**Model 2**			**Model 1**			**Model 2**		
Predictor	*B*	*(SE)*	*P*	*B*	*(SE)*	*p*	*B*	*(SE)*	*p*	*B*	*(SE)*	*p*	*B*	*(SE)*	*p*	*B*	*(SE)*	*p*
Actor age	.00	.38	.99	.03	.45	.95	.69	.25	.01	.73	.25	.003	.74	.27	.03	.70	.23	.002
Child age	-.06	.45	.90	.04	.49	.93	.73	.42	.08	.56	.40	.16	.28	.38	.46	.19	.39	.63
Child gender	.62	.45	.17	.62	.49	.21	.17	.42	.68	.09	.40	.83	-.15	.39	.79	-.14	.39	.72
CU traits				.05	.04	.22				-.09	.03	.01				-.05	.03	.14
Conduct problems				-.42	.18	.02				.03	.15	.82				.08	.15	.59

Notes. Actor age was coded: adult=-0.5 and child=0.5. Child gender was coded male=0 and female=1. Findings for CU traits were unchanged when CP were not included (**Table S11**) and after controlling for parental education and number of siblings. Gender did not moderate the main effect of CU traits (see https://osf.io/26rtw/?view_only=e8377234b2ef44709b61b5fa0d32204a).

Figure 1. The Eliciting Children's Helping Offers (ECHO) task included equal numbers of depictions of child and adults in instrumental and emotional need, as well as in neutral situations where no help was needed.

a. Instrumental need

adult

adult

child

child

b. Emotional need

adult

adult

child

child

c. Neutral (no help needed)

adult

adult

adult

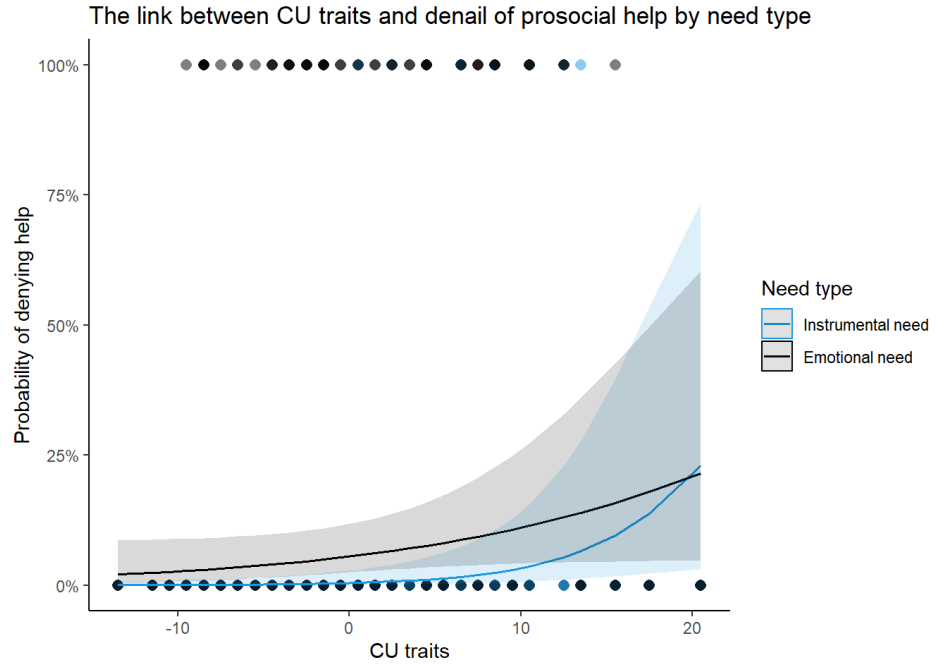
adult

child

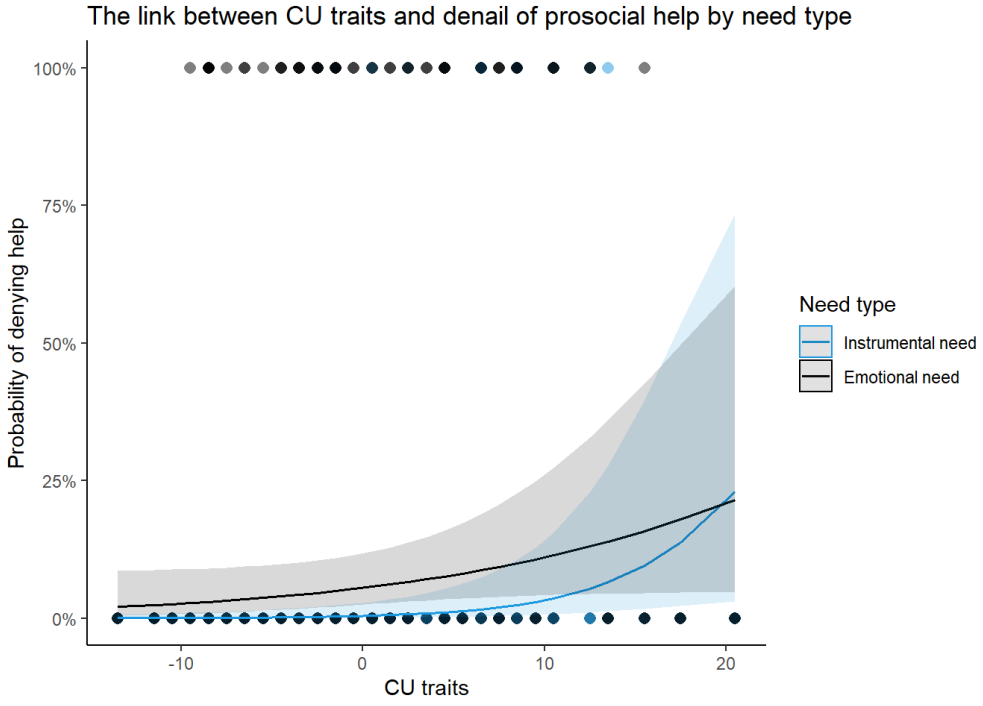
child

Figure 2. CU traits are related to lower recognition of emotional need and greater probability of denying instrumental help

a.



b.



Note. **a.** Higher CU traits are more strongly related to poorer recognition accuracy for emotional need (β=-.23, p=.002) than instrumental need (β=-.08, p=.03). **b.** Higher CU traits are more strongly related to greater probability of denying instrumental help (β=.21, p=.002) than emotional help (β=.08, p=.07).