Callous-Unemotional Traits as an Intervention Target and Moderator of Parent–Child Interaction Therapy—Emotion Development Treatment for Preschool Depression and Conduct Problems

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Objective: Callous-unemotional (CU) traits—characterized by low empathy, prosociality, and guilt—predict severe and persistent conduct problems. Although some interventions for conduct problems have been less effective in children with high levels of CU traits, studies have not examined whether CU traits interfere with treatment for other childhood disorders. Moreover, few treatments have demonstrated efficacy in decreasing CU traits themselves in early childhood. This study examined whether Parent–Child Interaction Therapy—Emotion Development (PCIT-ED), a novel PCIT adaptation that promotes emotional competence with demonstrated efficacy in treating preschool-onset major depressive disorder and oppositional defiant disorder, was also effective in treating these disorders in children displaying higher levels of CU traits. The study also examined whether PCIT-ED treatment produced significant and sustained decreases in CU traits.

Method: This study examined 3- to 5-year-olds (N = 114) with preschool-onset major depressive disorder who completed the PCIT-ED trial. Children were randomly assigned to either immediate PCIT-ED treatment (n = 64) or a waitlist control condition (n = 50) in which they received the active treatment after 18 weeks. Psychiatric diagnoses and severity and CU traits in children were assessed at baseline, immediately after treatment, and 18 weeks after treatment completion.

Results: Compared with the waitlist, PCIT-ED effectively reduced major depressive disorder and oppositional defiant disorder in preschoolers, regardless of initial levels of CU traits. Moreover, CU traits decreased from before to after treatment, and this treatment effect was sustained 18 weeks after treatment.

Conclusion: Results support that novel interventions that enhance emotional development display significant promise in treating CU traits—behaviors that left untreated predict severe conduct problems, criminality, and substance use.

Clinical trial registration information: A Randomized Controlled Trial of PCIT-ED for Preschool Depression; https://clinicaltrials.gov; NCT02076425.

Key words: callous-unemotional behavior, conduct problems, intervention, limited prosocial emotions, preschool

high levels of CU traits may be particularly important for efforts aimed at preventing and treating chronic conduct problems. CU traits theoretically begin to develop in infancy and are evident in toddlerhood during the same developmental window in which empathy, prosocial behaviors, and guilt emerge and develop rapidly. By age 3, CU traits can be reliably assessed by parent reports and have been associated with severe concurrent and later conduct problems. Interventions targeting CU traits may be most effective during early childhood, when these traits are developing and behavioral patterns are more malleable.

Recent studies have identified a distinct set of parenting, behavioral, and socioemotional correlates of early childhood CU traits. Low parenting warmth has been uniquely associated with CU traits, and children displaying high levels of CU traits have been found to be less sensitive to punishment, including parental discipline. Temperamentally, children displaying high levels of CU traits have been found to exhibit low affiliative reward (ie, deficits in deriving pleasure from interpersonal bonds) as early as infancy. Finally, children with CU traits exhibit significant deficits in emotional development, including reduced recognition of and neural response to others’ emotional expressions of fear and sadness. These neurocognitive deficits may be one mechanism through which CU traits develop, as children who do not readily detect others’ distress are less likely to experience aversion after causing another’s distress, which may lead to disrupted conscience development and callousness.

Do CU Traits Moderate Response to Treatment for Externalizing and Internalizing Disorders?

CU traits and conduct problems often co-occur, and CU traits have been found to designate a subgroup of children with more severe conduct symptoms. Some researchers have speculated that empirically supported treatments for conduct problems may be less effective for children with co-occurring CU traits because the targets of many established interventions (eg, in parenting interventions, decreasing coercive and inconsistent parenting and using punishment/consequences) are thought to play less of a role in the development of conduct problems for children with co-occurring CU traits. However, a systematic review by Wilkinson et al. concluded that evidence as to whether or not CU traits moderate the efficacy of conduct disorder interventions is highly mixed. Moreover, few of the reviewed studies were RCTs that included a control condition, obscuring how youths with high CU traits would have fared without treatment. Nonetheless, as CU traits may interfere with the efficacy of some treatments for conduct problems, it is important to identify specific interventions that are effective for these children. Some researchers have hypothesized that treatments may be more effective in the face of CU traits when they are initiated early and/or can be personalized to the child.

No study has examined whether CU traits interfere with empirically supported treatments for internalizing disorders. In fact, compared with the large literature on CU traits and conduct problems, fewer studies have examined relations between CU traits and internalizing problems. The dearth of research on this topic may in part be explained by the theory that psychopathy is characterized by fearlessness and shallow affect and is therefore incompatible with anxiety and depression. Despite this perspective, empirical evidence increasingly supports the existence of 2 CU subtypes—primary CU, marked by low levels of anxiety, and secondary CU, marked by high levels of anxiety. Findings examining associations between CU traits and depression are mixed. Some studies comparing children with conduct problems with and without CU traits have found that children with comorbid CU traits evidence less depression, whereas other studies have not found differences in depressive symptoms between these groups. Still other work has documented greater depressive symptoms in children with elevated CU traits. Given that some children presenting to treatment for internalizing disorders may also have elevated CU traits coupled with findings that CU traits may interfere with some treatments for conduct problems, it is important to examine whether CU traits moderate the efficacy of treatment for internalizing disorders. Evidence that children with high levels of CU traits are less responsive to treatments for depression or anxiety might suggest that the risk processes for these disorders in children with high levels of CU traits are distinct from the risk processes in children without high levels of CU traits. As such, different mechanisms might need to be targeted; for example, whereas many evidence-based treatments for anxiety and depression target abilities of children to identify, express, and regulate their own emotions, such treatments for children with high CU traits may also need to target children’s understanding of others’ emotions. Information about whether children with high levels of CU traits are responsive to treatments for internalizing problems could also inform the timing of interventions (eg, potentially reducing CU traits before targeting internalizing disorders).

Though some interventions have been found to successfully reduce CU traits themselves in middle to late childhood by targeting parenting, few interventions have attempted to target the unique deficits in emotional development that confer risk for CU traits in preschoolers, whose skills and capacities for emotion understanding, empathy, and guilt are rapidly developing and thus may be more malleable. Kimonis et al. recently developed an
adaptation of PCIT for 3- to 6-year-olds with conduct problems and CU traits (PCIT-CU) that modified standard PCIT with an adjunctive module designed to increase emotional responsivity of children to others’ distress. Children treated with PCIT-CU demonstrated significant decreases in CU traits that were sustained at 3 months after treatment. Although this study provides promising evidence of the utility of treatments that specifically target known risk factors for CU traits, it was a small pilot study that did not include a control condition, limiting conclusions. In contrast, a novel treatment developed to improve emotional engagement in children with CU traits through reciprocated parent—child eye gaze failed to demonstrate a significantly greater reduction in CU traits than an efficacious parenting intervention. As the unique deficits in emotional development that characterize children with high levels of CU traits continue to be relatively treatment resistant, identifying novel, effective treatments is needed.

PCIT-ED Treatment
One important aim of the current study was to examine whether PCIT-ED, a parent-child psychotherapy designed to enhance children’s emotional development, decreased CU traits in preschoolers. A single-blind RCT demonstrated the efficacy of PCIT-ED in treating preschool-onset MDD; it also improved ODD through standard PCIT components. PCIT-ED consists of a course of standard PCIT followed by a novel 8-session ED module. The ED module uses the teach and coach and bug-in-the-ear methods from standard PCIT to scaffold the caregiver’s response to the child’s intense and/or dysregulated emotions. The therapist coaches the parent during discussions of real-life emotional situations as well as during live in vivo stressors designed to induce the child’s emotions.

PCIT-ED may be an effective treatment for CU traits for several reasons. First, PCIT-ED directly targets parental warmth, which is often low in parents of children with high levels of CU traits, through standard PCIT components and the ED module. For instance, in child-directed interaction, therapists teach the parent positive parenting skills, such as praise, reflection, and enthusiasm and the use of “special time.” The ED module further enhances the parent’s ability to serve as an external emotion regulator through expressions of support, nurturance, and warmth and validation of the child’s emotions. Second, PCIT-ED may help increase affiliative behavior in children displaying high levels of CU traits who also display dispositional deficits in seeking out and maintaining social bonding. Sessions in the ED module are specifically aimed at increasing mutual positive affect in the parent—child dyad, which may facilitate social bonding. Third, the ED module targets children’s recognition and understanding of their own and others’ emotions, known deficits in children with elevated CU traits. Finally, the ED module includes sessions to enhance moral emotions and behaviors that are deficient in children with CU traits. For example, parents are coached to scaffold their children’s healthy guilt feelings and teach children reparative prosocial skills (ie, prosocial skills used after a transgression or wrongdoing). This is a particularly novel aspect of PCIT-ED treatment given that, to our knowledge, only one prior treatment directly targets the deficient moral emotions and traits that constitute CU traits.

Overview and Study Hypotheses
The purpose of this study was to conduct a secondary analysis of children who completed a PCIT-ED RCT to test whether PCIT-ED is an effective treatment for preschool-onset MDD and ODD in children displaying high levels of CU traits and whether PCIT-ED treatment produces significant and sustained decreases in CU traits. As no study has examined whether CU traits interfere with treatments for internalizing disorders, we did not have a specific hypothesis regarding whether CU traits would moderate the effectiveness of PCIT-ED in treating MDD. Though evidence is mixed, we hypothesized that, compared with children who displayed lower levels of CU traits, children with higher levels of CU traits would be more likely to continue to meet criteria for ODD following PCIT-ED treatment based on some studies that have documented poorer treatment outcomes for conduct problems in children displaying higher levels of CU traits. Finally, we hypothesized that PCIT-ED treatment would reduce CU traits in children and that this reduction would be sustained 18 weeks after treatment.

METHOD
Participants
Details about the PCIT-ED study design, recruitment, and methods are reported in the original article on treatment outcomes. The RCT was registered with clinicaltrials.gov (NCT02076425); the Consolidated Standards of Reporting Trials diagram is depicted in Figure S1, available online. This study examined a subgroup of participants who had data from the Child Behavior Checklist 1/2−5 (CBCL/1/2−5); older participants who received the CBCL/6−18 were excluded, as this study examined a CU traits scale previously validated in the CBCL/1/2−5 only. A small number of children (n = 31) aged out of the CBCL/1/2−5 during this study; there were no significant demographic or clinical differences between children who did vs did not age out (Tables S1 and S2, available online). Children were 3 to 5 years old (N = 114) and were recruited from preschools,
primary care facilities, and mental health clinics in the St. Louis metropolitan area. The Preschool Feelings Checklist (PFC) was used to identify children with preschool-onset MDD. Children with elevated PFC scores (≥ 3) were invited to the laboratory for a comprehensive assessment. Children who met criteria for MDD based on the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Early Childhood (K-SADS-EC)39 were randomly assigned to either immediate PCIT-ED treatment (n = 64) or to a waitlist (WL) control condition (n = 50) in which they received the active treatment after 18 weeks. Exclusion criteria included the presence of a neurological disorder or current treatment with antidepressant medications or psychotherapy. Children were also excluded if parents reported a diagnosis of autism spectrum disorder. A standard cutoff of a T score > 59 on the Social Responsiveness Scale40 was used to further screen for possible autism spectrum disorder; in addition to this, children who endorsed symptoms suggestive of self-stimulating behavior, lack of social reciprocity, and lack of symbolic play prompted a screen-out based on review of the senior clinician (J.L.). Table 1 presents descriptive statistics by study group.

Course of Treatment
As described above, PCIT-ED is a manualized, 20-session psychotherapy conducted over 18 weeks. The treatment consists of 6 sessions of child-directed interaction and 6 sessions of parent-directed interaction, followed by a novel, 8-session ED module. Comprehensive assessments by raters blinded to treatment condition were completed at baseline; at post 1, immediately after PCIT-ED (for WL participants, 18 weeks after randomization) (see Figure S2, available online); and at post 2, 18 weeks after treatment completion. However, only children randomly assigned to PCIT-ED first underwent another assessment 18 weeks after therapy completion (ie, post 2) and thus are the only children included in the analysis examining whether any effect of PCIT-ED on CU traits held at post 2 (n = 44).

Measures
Child Psychopathology. Psychiatric diagnoses and severity were determined in the children using K-SADS-EC, a diagnostic interview in which a trained rater asks parents a series of developmentally appropriate questions to assess DSM-5 criteria for psychiatric disorders in preschool-aged children. The K-SADS demonstrates good test-retest reliability and construct validity. The current study examined the presence of MDD and ODD as well as MDD and ODD severity; severity of a particular disorder was calculated by summing the number of core symptoms endorsed. Following Luby et al.,9 MDD remission status was examined as the primary MDD treatment outcome, which was defined as no longer meeting criteria for MDD and a ≥ 50% reduction in children’s MDD severity scores. Diagnostic interviews were

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observed range</th>
<th>Mean (SD) or frequency</th>
<th>( \chi^2 ) or ( t ) value(^a)</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline age, y</td>
<td>3.03 to 5.60</td>
<td>PCIT-ED (n = 64) 4.56 (0.62)</td>
<td>WL (n = 50) 4.40 (0.76)</td>
<td>−1.20</td>
</tr>
<tr>
<td>Sex, female %</td>
<td></td>
<td></td>
<td></td>
<td>1.38</td>
</tr>
<tr>
<td>Race %</td>
<td></td>
<td></td>
<td></td>
<td>F.E.</td>
</tr>
<tr>
<td>White</td>
<td>40.6</td>
<td>30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>90.6</td>
<td>74.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biracial/multiracial</td>
<td>3.1</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity, Hispanic/Latinx %</td>
<td>6.3</td>
<td>18.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline CU traits</td>
<td>0 to 8</td>
<td>2.77 (1.81)</td>
<td>3.31 (1.99)</td>
<td>1.50</td>
</tr>
<tr>
<td>MDD severity</td>
<td>3 to 9</td>
<td>5.39 (1.42)</td>
<td>5.38 (1.54)</td>
<td>−0.04</td>
</tr>
<tr>
<td>ODD severity</td>
<td>0 to 8</td>
<td>2.89 (2.01)</td>
<td>3.48 (2.40)</td>
<td>1.43</td>
</tr>
<tr>
<td>Post 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU traits</td>
<td>0 to 10</td>
<td>1.14 (1.40)</td>
<td>3.08 (2.51)</td>
<td>4.91</td>
</tr>
<tr>
<td>Change in ODD severity</td>
<td>−6 to 4</td>
<td>−2.16 (1.97)</td>
<td>−1.20 (2.02)</td>
<td>2.54</td>
</tr>
<tr>
<td>Post 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU traits</td>
<td>0 to 8</td>
<td>1.23 (1.58)</td>
<td></td>
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</tr>
</tbody>
</table>

Note: Post 1 indicates 18 weeks after randomization; Post 2 indicates 18 weeks after treatment completion. CU = callous-unemotional; MDD = major depressive disorder; ODD = oppositional defiant disorder; PCIT-ED = Parent–Child Interaction Therapy—Emotion Development; WL = waitlist.

\(^a\) Independent samples \( t \) test was used to compare continuous variables across groups, \( \chi^2 \) test was used to compare categorical/binary variables across groups, and Fisher exact test (F.E.) was used when there were small expected cell counts.
CU Traits. We used a widely used measure of early childhood CU traits, a scale first derived from factor analyses of the CBCL/1½−5. Five independent studies have demonstrated that the scale forms a separate factor from the ODD and attention-deficit/hyperactivity disorder scales of the CBCL/1½−5, supporting that it distinguishes CU traits from other externalizing problems in the preschool period. The CU traits scale score is a sum of the following 5 items (possible range 0–10): “punishment won’t change behavior,” “seems unresponsive to affection,” “shows little affection toward people,” “shows too little fear,” and “doesn’t feel seem to feel guilty after misbehaving.” In the current sample, children with greater CU traits also demonstrated lower levels of empathy, prosocial trait, and guilt, replicating previous studies and demonstrating construct validity (see Supplement 1, Table S3, available online). Internal consistency was adequate (α = .69) and comparable to that found in other samples using the same scale.

Ethical Considerations
Study procedures were preapproved by the Washington University School of Medicine Institutional Review Board. Informed consent and assent was obtained from parents and children, respectively.

Data Analytic Plan. The first analysis examined whether CU traits moderate the efficacy of PCIT-ED in treating depression and conduct problems. A logistic regression analysis probed the interaction between baseline CU traits and treatment group in predicting MDD remission at post 1. This analysis controlled for children’s age, sex, and baseline MDD severity. A second logistic regression analysis probed the interaction between CU traits and treatment group in predicting ODD diagnosis at post 1. This analysis controlled for children’s age, sex, and baseline ODD severity. Assumptions of logistic regression were met.

The second analysis examined whether PCIT-ED reduced CU traits. Treatment group was the grouping variable in an analysis of covariance examining group differences in levels of CU traits between PCIT-ED and WL participants. The analysis controlled for children’s age, sex, and baseline levels of CU traits. A follow-up analysis of covariance examined whether any significant result held when additionally controlling for children’s baseline MDD severity and the change of children’s ODD severity score from baseline to post 1. This allowed us to examine whether any reduction in CU traits following treatment was simply a function of ODD symptom improvement.

The third analysis examined whether any effect of PCIT-ED treatment on reducing CU traits was sustained 18 weeks after treatment ended. A linear mixed model analysis was conducted that compared differences in levels of children’s CU traits between post 1 and post 2. The analysis controlled for age, sex, and baseline MDD severity. Note that owing to study design only children randomly assigned to the PCIT-ED group completed a post 2 assessment, and thus this analysis examined children in the PCIT-ED group only. Assumptions were met with the exception of the assumption of normality. As both analysis of covariance and linear mixed models are highly robust to violations of normality, they were selected as the primary analytic approaches and confirmed with nonparametric statistics (see Supplement 2, available online).

RESULTS
Correlations among variables are presented in Table 2. There were high rates of psychiatric comorbidity with MDD in this sample; at baseline, children also met criteria for other disorders, including ODD (42.1%), an anxiety disorder (33.3%), attention-deficit/hyperactivity disorder (24.6%), obsessive-compulsive disorder (3.5%), and post-traumatic stress disorder (2.6%). There were no significant demographic differences between the PCIT-ED and WL randomization groups.

The distribution of the CU traits scale at baseline was only slightly positively skewed (0.23). CU traits were not significantly associated with children’s sex or race, but younger children demonstrated significantly greater CU traits at the baseline assessment. Greater CU traits in children were moderately and significantly associated with their greater ODD symptom severity at each time point. Analyses did not indicate a need to control for therapist in tests of study hypotheses (see Table S4, available online).

Do CU Traits Moderate the Efficacy of PCIT-ED in Treating Depression and Conduct Problems?
The interaction of CU traits and treatment group was not a significant predictor of odds of MDD remission at post 1 (Table 3). The interaction of CU traits and treatment group in predicting odds of ODD at post 1 was also not significant. In other words, children with greater CU traits were no less likely to benefit from the effects of PCIT-ED treatment in terms of their MDD and ODD improvement than children with lower levels of these traits.
Does PCIT-ED Reduce CU Traits?
Compared with the WL control, children who received PCIT-ED treatment displayed a significantly greater reduction in CU traits at post 1 (Table 4). This result continued to be significant when children’s baseline MDD severity and change in ODD symptoms across treatment were added to the model as covariates. This indicates that PCIT-ED was effective in reducing CU traits and that this reduction was not simply a function of ODD symptom improvement over the course of treatment. Cohen’s $d$ for change from baseline to post 1 indicated a large effect of treatment on CU traits (0.74; greater improvement in the PCIT-ED group).

Is the Effect of PCIT-ED on Reducing CU Traits Sustained 18 Weeks After Treatment?
Levels of CU traits did not differ significantly between post 1 and post 2, suggesting that the effect of PCIT-ED in reducing CU traits was maintained at 18 weeks after treatment (Table 5).
The purpose of this study was to examine whether PCIT-ED, a recently developed empirically supported treatment for preschool-onset MDD was also effective for children displaying co-occurring CU traits and whether the treatment decreased CU traits. We found that PCIT-ED was equally effective in treating MDD and ODD in preschoolers, regardless of children’s levels of CU traits. Moreover, CU traits decreased from before to after treatment, above and beyond concurrent reductions in ODD symptom severity. This treatment effect was sustained 18 weeks after treatment and held when controlling for other comorbidities.

Baseline CU traits were approximately normally distributed in this sample. This distribution of CU traits, coupled with the high rates of psychiatric comorbidities, underscores that our sample was quite psychiatrically ill. At the same time, children’s baseline CU trait severity was unassociated with their depressive symptom severity. Thus, in preschoolers with clinical depression, CU traits were normatively represented, yet their problems with CU traits and depression were unrelated. This adds to a literature that has been mixed regarding the relations between CU traits and depression in older children and adolescents with CU traits in the context of conduct problems. More research is needed to explore the relations between depressive diagnoses and severity and CU traits, which might depend on sample characteristics. For example, given some evidence that preschoolers with secondary CU (ie, CU with high anxiety) demonstrate greater depression, studies with larger samples might test whether associations between CU traits and depression differ depending on children’s CU subtype.

### TABLE 4 Comparison of Callous-Unemotional Traits Scale Scores at Post 1 in Parent—Child Interaction Therapy—Emotion Development vs Waitlist Subjects (N = 114)

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.7349</td>
<td>1.1722</td>
<td>0.63</td>
<td>.5320</td>
</tr>
<tr>
<td>Baseline age</td>
<td>0.1296</td>
<td>0.2378</td>
<td>0.55</td>
<td>.5867</td>
</tr>
<tr>
<td>Female sex</td>
<td>−0.2837</td>
<td>0.3320</td>
<td>−0.85</td>
<td>.3947</td>
</tr>
<tr>
<td>Baseline CU traits</td>
<td>0.5571</td>
<td>0.0862</td>
<td>6.46</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>PCIT-ED vs WL</td>
<td>−1.6102</td>
<td>0.3251</td>
<td>−4.95</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

Model with age, sex, baseline CU traits, MDD severity, and change in ODD severity

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.0021</td>
<td>1.2639</td>
<td>0.79</td>
<td>.4296</td>
</tr>
<tr>
<td>Baseline age</td>
<td>0.1671</td>
<td>0.2514</td>
<td>0.66</td>
<td>.5077</td>
</tr>
<tr>
<td>Female sex</td>
<td>−0.2945</td>
<td>0.3370</td>
<td>−0.87</td>
<td>.3841</td>
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<tr>
<td>Baseline MDD severity</td>
<td>−0.0816</td>
<td>0.1141</td>
<td>−0.71</td>
<td>.4763</td>
</tr>
<tr>
<td>Change in ODD severity</td>
<td>−0.0058</td>
<td>0.0854</td>
<td>−0.07</td>
<td>.9456</td>
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<tr>
<td>Baseline CU traits</td>
<td>0.5576</td>
<td>0.0870</td>
<td>6.41</td>
<td>&lt; .0001</td>
</tr>
<tr>
<td>PCIT-ED vs WL</td>
<td>−1.6180</td>
<td>0.3413</td>
<td>−4.74</td>
<td>&lt; .0001</td>
</tr>
</tbody>
</table>

**Note:** Post 1 indicates 18 weeks after randomization. Boldface type indicates statistical significance of predictor of interest. CU = callous-unemotional; MDD = major depressive disorder; ODD = oppositional defiant disorder; PCIT-ED = Parent—Child Interaction Therapy—Emotion Development; WL = waitlist.

### TABLE 5 Mixed Model Comparing Callous-Unemotional Traits at Post 1 and Post 2 in Parent—Child Interaction Therapy—Emotion Development Subjects (n = 64)

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.8938</td>
<td>1.5123</td>
<td>0.59</td>
<td>.5566</td>
</tr>
<tr>
<td>Baseline age</td>
<td>0.2412</td>
<td>0.2873</td>
<td>0.84</td>
<td>4.046</td>
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<tr>
<td>Female sex</td>
<td>−0.4288</td>
<td>0.3673</td>
<td>−1.17</td>
<td>.2478</td>
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<tr>
<td>Baseline MDD core score</td>
<td>−0.1941</td>
<td>0.1277</td>
<td>−1.52</td>
<td>.1341</td>
</tr>
<tr>
<td>Time point</td>
<td>0.3571</td>
<td>0.2025</td>
<td>1.76</td>
<td>.0849</td>
</tr>
</tbody>
</table>

**Note:** Post 1 indicates 18 weeks after randomization; Post 2 indicates 18 weeks after treatment completion. MDD = major depressive disorder.
In the current study, treatment with PCIT-ED was effective at reducing both ODD and MDD symptoms, regardless of the severity of CU traits at baseline. Thus, using an RCT design that enabled tests of moderation rather than prediction, our study did not find evidence that CU traits moderate treatment effects. On one hand, our finding contrasts with some studies that have found that CU traits predicted poorer conduct problem treatment outcomes across various treatment modalities, including parent management training and family-based interventions. This poorer response may be due to the reliance of these treatments on punishment, an approach that is theoretically less effective in reducing behavior problems in the context of CU traits, as children with high CU traits have been found to display insensitivity to punishment. PCIT-ED may circumvent this limitation by placing greater emphasis on increasing parenting warmth through both standard PCIT and the ED module, improving the parent–child relationship, providing natural rewards for positive traits in the child’s environment, and increasing the child’s emotional competence. On the other hand, our finding is congruent with other studies that have found that CU traits do not reduce the effectiveness of interventions for conduct problems. For example, Hyde et al. found that CU traits did not moderate the effect of a parenting intervention (ie, Family Check-Up) on conduct problems in 3- to 6-year-olds. Similar to the Family Check-Up, PCIT-ED is initiated very early in development, when conduct problems may be more malleable. To our knowledge, our study is the first to examine whether CU traits moderate the efficacy of treatment for internalizing disorders such as MDD. The finding that CU traits do not impact the efficacy of the only empirically supported treatment for preschool-onset MDD adds to evidence that children with these symptoms should not be conceptualized as likely treatment resistant, though examination of RCTs of treatments for anxiety disorders and replication in future studies remains essential. Future research should also explore the possibility that early childhood is a sensitive period for intervention for various psychopathology in the face of high CU traits.

Preschoolers who received PCIT-ED treatment displayed greater reductions in CU traits immediately following treatment compared with a waitlist control group, an effect that was large and cannot be explained by co-occurring ODD symptom improvement. Moreover, this reduction in CU traits was sustained when assessed at 18 weeks after treatment. This finding suggests that PCIT-ED can effectively decrease CU traits in preschoolers and that treatment gains are maintained for at least several months following treatment. Despite that CU traits predict a severe and impairing course of conduct problems and other psychosocial problems including substance use, very few treatments have demonstrated efficacy in decreasing these traits in early childhood, a developmental period in which they emerge and may be most malleable. Our findings suggest that PCIT-ED is among a very limited number of treatments that have demonstrated efficacy in decreasing CU traits in early childhood, and one of the only to do so by targeting emotional development—an important feature of the treatment considering that early childhood is a time in which moral emotions and traits are developing and malleable. Future research should identify the mechanisms through which PCIT-ED affects CU traits, which may include increasing parental warmth, bolstering children’s affiliative tendencies, and enhancing children’s moral emotions and traits. Identifying the underlying mechanisms through which PCIT-ED has an effect on CU traits may pinpoint which treatment components are most effective, informing future efforts to develop and refine treatments for CU traits.

The current study has limitations that are worth noting. Although this study was unique in that it was the first to examine treatment of CU traits in clinically depressed children, the use of this sample also has some inherent limitations in that it is unclear whether the effect of PCIT-ED in decreasing CU traits would generalize to preschoolers displaying elevated CU traits without co-occurring depressive symptoms. On one hand, it is unclear whether findings would generalize to traditionally studied groups of children clinically referred for conduct problems who evidence comparatively higher levels of CU traits. On the other hand, findings may not be unique to children with internalizing problems given the high level of comorbidity between internalizing and externalizing symptoms in our sample and in general. Moreover, it is possible that in depressed samples, children’s depressive symptoms could drive parent report of CU traits (eg, parents could interpret depression-related withdrawal as reduced affiliative reward), though the lack of association in this study between depressive severity and CU trait severity suggests that this does not seem to be the case in our sample. Future research examining the efficacy of PCIT-ED in decreasing CU traits in samples of children with varying clinical characteristics will be necessary. Importantly, the study examined a primarily non-Hispanic, White sample. Future research should examine more diverse samples of children to replicate our findings and examine race and/or ethnicity as possible treatment modifiers. Further, this study was an RCT, conducted in a highly controlled setting. Future effectiveness studies that examine the effect of PCIT-ED in real-world settings, such as clinical practices...
in the community, will be important. Finally, the measure of CU traits contained a small number of items (n = 5) and did not assess some features that are core to the CU traits construct, such as low empathy and lack of concern about one’s own performance.

In sum, this study demonstrated that PCIT-ED, an adaptation of PCIT that includes a module to enhance emotional development, effectively treated MDD and ODD in preschoolers regardless of their levels of CU traits. Moreover, treatment with PCIT-ED effectively reduced CU traits in a sample of clinically depressed preschoolers. The identification of PCIT-ED as an efficacious treatment for CU traits is significant given that CU traits are associated with serious societal burden and impairment and that, to date, very few treatments have demonstrated efficacy in young children. Our findings support that nascent efforts to formulate interventions that enhance emotional development hold significant promise in treating CU traits during early childhood, a developmental period in which these traits emerge and may be most amenable to treatment.

**REFERENCES**


