Attachment and callous-unemotional traits in children with early-onset conduct problems

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Background: Antisocial children with callous-unemotional (CU) traits appear to be disconnected from other people’s emotions; although little is known about their experience of the parent-child emotional bond. This study examined parent-child attachment relationships and levels of CU traits in conduct-problem children. Method: Attachment classifications in boys (M = 6.31 years) with disruptive behaviour disorders were assessed using the Manchester Child Attachment Story Task. Multiple informants rated children’s CU traits. Results: Independent of severity of conduct problems, high levels of CU traits were associated with more insecure attachment; specifically, disorganised attachment representations; however, CU traits were not associated with avoidant representations. Conclusions: Among conduct-problem children, those higher on CU traits appear to be at increased risk of experiencing disruptions in parent-child attachment relationships; attachment may be an important area for treatment and prevention efforts for CU traits in young children. Keywords: Callous-unemotional, attachment, parent-child relationship, conduct problems.

Introduction

The construct of adult psychopathic traits has been downwardly extended to children to demarcate subgroups of antisocial youth with distinct etiologies and pathways of conduct problems (Frick & White, 2008). Conduct-problem youth elevated on CU traits appear to be disconnected from other people’s emotions. That is, they pay less attention, and are less responsive, to others’ affect (Blair, 1999; Dadds, Jambrak, Pasalich, Hawes, & Brennan, 2011; Kimonis, Frick, Fazeekas, & Loney, 2006), and are lacking in empathy (Anastassiou-Hadjicharalambous & Warden, 2008; Dadds et al., 2009). Results from twin studies suggest that high levels of CU traits and coexisting conduct problems may be under strong genetic influences (Viding, Blair, Moffitt, & Ploomin, 2005); however, there is some evidence that CU traits can be modified by psycho-social interventions (Hawes & Dadds, 2007; Kolko et al., 2009; McDonald, Dodson, Rosenfeld, & Jouriles, 2011). Thus, there is an important and timely need to identify dimensions of parent-child dynamics that may hold the most value for prevention and intervention efforts for CU traits and associated antisocial outcomes in young children.

There is evidence to suggest that the affective quality of parent-child relationships may be particularly important for the socialisation of antisocial children elevated on CU traits. First, a secure parent-child attachment relationship provides a more effective alternative to parental discipline for moral development, in children with CU temperament characteristics; that is, low arousal/fear (Fowles & Kochanska, 2000; Kochanska, 1997). Second, parental warmth is negatively associated with antisocial behaviour in children with high rather than low CU traits (Kroneman, Hipwell, Loebel, Koot, & Pardini, 2011; Pasalich, Dadds, Hawes, & Brennan, 2011). Third, more parental warmth/involvement predicts decreasing levels of CU traits (Pardini, Lochman, & Powell, 2007). Not surprising then, are findings suggesting that children high on CU traits experience a poorer quality of parent-child relationship; marked by parents’ disrupted emotional bonds with their child (Fite, Greening, & Stoppelbein, 2008) and less warmth in parent-child relationships (Pardini et al., 2007; Schneider, Cavell, & Hughes, 2003).

Most of the above studies relied on questionnaire reports of parent-child dynamics – predominantly from the perspective of parents, and we are not aware of any study that has examined how young children with high CU traits and clinically referred conduct problems ‘make sense’ of interactions with their parents. Children come to internalise early interactions with, and expectations of, attachment figures and form mental representations – i.e. cognitive-affective schemas – of attachment relationships (Bowlby, 1982). These attachment representations influence children’s cognitions, feelings, and behaviour in subsequent relationships and interactional settings; having an overall effect on the style in which an individual relates to others (Bowlby, 1982; Bretherton & Munholland, 1999). This study attempts to overcome limitations of, and extend on, prior research by examining representations of attachment relationships in children with disruptive behaviour disorders (DBDs) and CU traits.

Attachment has long been considered important in conceptualisations of psychopathy. Prominent models of psychopathy argue that psychopathic
individuals are incapable of forming genuine affectional bonds (Cleckley, 1976; McCord & McCord, 1964). Bowlby’s (1982) attachment theory grew out of his early work with ‘affectionless’ children (Follan & Minnis, 2010). He claimed that early disruptions in attachment relationships were important in explaining affectionless traits – for example, indifference to others’ feelings and superficial charm; akin to CU traits—in antisocial children (Bowlby, 1944). This claim is supported by the ERA longitudinal study which included youth showing emotional and cognitive disturbances as a result of early institutional neglect. Attachment problems at age 4 were associated with CU features, namely interpersonal insensitivity and lack of concern for others, at age 15 (Sonuga-Barke, Schlotz, & Kreppner, 2010). Moreover, existing research on attachment representations in adolescents and adults with personality features conceptually similar to psychopathy, suggests that these individuals tend to be dismissive of early attachment experiences (corresponding to avoidant attachment classification in childhood) (e.g. Frodi, Dernevik, Sepa, Philipson, & Bragesjo, 2001; Rosenstein & Horowitz, 1996).

There is a relatively high prevalence of insecure attachment in children with early-onset conduct problems (Greenberg, Speltz, Deklyen, & Endriga, 1991). Insecure-disorganised attachment is particularly common in conduct-problem samples (e.g. Green, Stanley, & Peters, 2007) and shows a robust association with antisocial behaviour (Fearon, Berrmans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010). Disorganised attachment is marked by an absence of coherent strategies for attachment-related resolution of distress, and often chaotic and bizarre child behaviour (Main & Solomon, 1986). Children with disorganised attachments at the representational level, tend to control their caregivers in actual attachment scenarios; either through caregiving or punitive-controlling behaviour (Bureau & Moss, 2010; Solomon, George, & De Jong, 1995). These controlling forms of behaviour might be an attempt by children to increase their caregiver’s attention and involvement in attachment interactions (Jacobvitz & Hazen, 1999). The latter form of coercive attachment behaviour is more frequently observed in children with conduct problems (Greenberg et al., 1991; Moss, Cyr, & Dubois-Comtois, 2004).

Interestingly, a coercive style of relating to others is conceptualised by some researchers as a core feature of adult psychopathy (Blackburn, 1998) and appears to be characteristic of conduct-problem children with high levels of CU traits. For instance, antisocial children higher on CU traits use more interpersonal aggression to achieve social power; including premeditated acts of aggression and bullying behaviour (Frick, Cornell, Barry, Bodin, & Dane, 2003; Viding, Simmonds, Petrides, & Frederickson, 2009). At the cognitive level, higher CU traits in conduct-problem youth are associated with stronger beliefs in the importance of asserting dominance and seeking revenge in peer-relationships (Pardini, 2011; Pardini, Lochman, & Frick, 2003); as well as a tendency to misperceive conflict in friendships (Muñoz, Kerr, & Besic, 2008).

In summary, the affective quality of parent-child interactions is an important domain for the socialisation of antisocial children with elevated CU traits. This study examined the association between CU traits and attachment representations in boys with clinic-referred conduct problems. We hypothesised that higher CU traits would predict a greater likelihood of insecure attachment representations. More specifically, the evidence reviewed regarding coercive control indicates that antisocial children elevated on CU traits should show higher levels of disorganised representations. It is also possible that these children have attachment representations that minimise the significance of interpersonal contact – i.e. avoidant representations – as potentially manifested by their restricted emotionality and emotional detachment in relationships. Therefore, we expected CU traits to be associated with higher levels of both disorganised and/or avoidant representations of parent-child attachment relationships.

**Method**

**Participants**

The initial sample included 60 boys (aged 3–9 years) who were referred to a university psychology clinic for assessment and treatment of their conduct problems. A subset of children in this sample (25–53%) have been reported on in prior research examining different dimensions of parent-child interaction using independent measures (Dadds et al., 2011; Pasalich et al., 2011). University ethics approval and participant’s consent were obtained. We were not able to collect or code attachment data for five boys: two due to task refusal and three due to incomprehensible or limited use of language during the attachment assessment (one was diagnosed with Selective Mutism). These boys were significantly younger than the final cohort and were excluded from the study. Thus, the final sample was 55 boys (3–9 years, \( M = 6.31, SD = 1.80 \)).

All children received a diagnosis of oppositional defiant disorder (95%) or conduct disorder. Comorbidity included attention-deficit–hyperactivity disorder (35%) and mood disorders (18%). Children with a developmental delay or disability were not included. Diagnoses were based on DSM-IV (American Psychiatric Association, 1994) criteria using the Diagnostic Interview Schedule for Children, Adolescents, and Parents (DISC-IV; American Psychiatric Association, 1994) criteria using the Diagnostic Interview Schedule for Children, Adolescents, and Parents (DISC; Holland & Dadds, 1997). Severity of children’s DBD symptoms ranged from moderate (31%), to marked (42%), to severe/very severe (27%). Interrater agreement among a team of psychologists/psychiatrists for diagnostic classifications was good (average \( k = .79 \)), and acceptable for diagnostic severity ratings (average \( r = .50 \)). The majority of children came from two-parent families (77%). Mothers’ highest level of education attained ranged from 4 years of secondary school (6%), to 6 years of secondary school.
(7%), to technical/skills-based tertiary education (38%), to university education (49%).

Child measures

We used the UNSW system (Dadds, Fraser, Frost, & Hawes, 2005) of pooling items from the Strengths and Difficulties Questionnaire (Goodman, 1997) and Antisocial Process Screening Device (Frick & Hare, 2001) to create aggregated measures of children's behavioural and emotional problems and CU traits. Mother and father reports for conduct problems, hyperactivity, and anxiety showed modest to good reliability (Cronbach's $\alpha$ range = .65–.82) and were positively correlated ($r$ range = .56–.61, all $p$'s < .01); and were standardised and then averaged to form combined parent reports. Consistent with our previous research (e.g. Dadds et al., 2011; Pasalich et al., 2011), we created a multi-informant measure of CU traits from mother, father, and teacher reports, by calculating the percentage of reporters that rated a child as 'high CU traits' (i.e. top one-third of scores relative to each informant group). This high CU cut-off percentile value is consistent with prevalence estimates of high CU generally found in conduct-problem samples (e.g. Frick, Bodin, & Barry, 2000) and is in line with our past research (Pasalich et al., 2011). Alphas ranged from acceptable to high for mother (.72), father (.79), and teacher (.90) CU traits reports. Dependent on the number of informant reports available (mother $n$ = 52; father $n$ = 46; teacher $n$ = 49), CU traits scores ranged from 0%, 33.3%, 50%, 66.7%, and 100%. Multi-informant CU traits scores correlated with mother ($r$ = .68), father ($r$ = .72), and teacher ($r$ = .47) (all $p$'s < .01) CU traits scores; but not with the number of missing reporters ($r$ = .05, $p$ = .73). See Appendix 1 for further descriptive statistics on CU traits scores.

Children's attachment representations were assessed using the Manchester Child Attachment Story Task (MCAST; Green, Stanley, Smith, & Goldwyn, 2000), a story-stem completion task that includes four vignettes with attachment themes (e.g. lost in shops, nightmare) and a control vignette (breakfast time) for comparison. Stories are enacted using a doll house with play furniture and figurines that are representative and then merged across participants to produce an index of verbal ability.

Family functioning measures

Maternal depression and stress were measured using self-reports on the Depression Anxiety Stress Scale 21 Item Short Form (Lovibond & Lovibond, 1995). It has demonstrated reliability and validity in the assessment of adult mood (e.g. Antony, Bieling, Cox, Enns, & Swinson, 1998); $x = .74$ for depression and .79 for stress. Clinicians rated the quality of family environment (QFE; Rey et al., 1997) based on families' overall functioning and stability/safety of the home environment, from 1 (very disturbed) to 90 (adequate). QFE ratings have good psychometric properties in clinic samples (Rey et al., 1997).

Results

Preliminary analyses

Table 1 shows descriptive statistics for demographic, CU traits, and child behavioural and emotional symptoms. 49% of children were rated as having insecure attachment representations (Table 2). Only avoidant and disorganised styles of insecure attachment representations were observed; with a higher percentage of the latter. The majority of disorganised children (70%) received a forced-choice secondary rating of secure attachment. Children's continuous disorganisation scores ranged from 1 to 9, with $M = 3.78$, and $SD = 2.57$. To test for potential covariates, we examined whether attachment classification groups differed on the child and family variables shown in Table 1, as well as on single parent status and child diagnostic comorbidity (see Appendix 2 for correlations among these variables). There were contradictory behaviour, and bizarre/chaotic themes) were rated on a 9-point scale.

The MCAST has demonstrated reliability and validity in community (e.g. Barone et al., 2009; Green et al., 2000) and clinic (e.g. Futh et al., 2008; Green et al., 2007) samples. Two examiners from this study were officially trained by an MCAST representative on administration and coding of the task, and passed a coding reliability exam. One of these examiners coded the sample and 25% of the assessments were re-coded by the second trained examiner. Interrater reliability was high for classifications of insecure ($k = .85$) and disorganised ($k = .81$) attachment; although lower for avoidant ($k = .42$), due to the small ($n = 2$) number of these recognised by each coder in this subsample. Intraclass correlation = .88 for continuous disorganisation scores. Coders were blind to children's CU traits scores and diagnoses.

Children's verbal ability was examined using verbal IQ scores from the Wechsler Preschool and Primary Scale of Intelligence – Third Edition (WPPSI-III; Wechsler, 2002) for 3–5 year-olds; the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003) for 6–8 year-olds; and WebNeuro (Silverstein et al., 2007) for 9 year-olds. Z scores within each age appropriate language measure were calculated and then merged across participants to produce an index of verbal ability.
Relationship between CU traits and children’s attachment representations

First, we examined the prediction of attachment classifications (binary coded) from age, mothers’ education, and CU traits in logistic regressions. Bootstrapped confidence intervals (CI) for the standardised regression coefficients based on 1000 replications are also reported (Davison & Hinkley, 1997).

The overall model for insecure attachment was significant, $\chi^2(3) = 8.64, p < .05$; accounting for between 15% and 19% of the variance in this criterion variable (Table 3). As hypothesised, children with higher levels of CU traits had a greater likelihood of an insecure attachment representation (95% CI = .02–.56). Age (95% CI = −.41 to .06) and mothers’ education (95% CI = −.37 to .11) were not significant predictors in this model. For avoidant attachment, the overall model was non-significant, $\chi^2(3) = 5.67, p > .10$; although there was a trend towards older children having a higher likelihood of an avoidant attachment representation (95% CI = .09–.45). Finally, the overall model for disorganised attachment was significant, $\chi^2(3) = 16.70, p < .01$; accounting for between 26% and 36% of variance. As hypothesised, children with higher levels of CU traits were more likely rated as disorganised in their attachment representations (95% CI = .01–.50). Moreover, younger children (95% CI = −.59 to −.17), as well as a trend (at $p = .05$) towards the children of mothers with lower levels of education (95% CI = −.50 to .00), had a higher likelihood of disorganised attachment.

We next examined whether CU traits were associated with continuous attachment disorganisation scores over and above the effects of age and mothers’ education. The overall model was significant, $F(3,51) = 6.18, p < .01$; and accounted for 22% of variance in disorganisation (Table 4). Consistent with the previous analysis, there was a trend (at $p = .05$) towards a positive association between levels of CU traits and continuous disorganisation scores (95% CI = .01–.45). Furthermore, age was significantly negatively associated with disorganisation scores (95% CI = −.64 to −.21). Lastly, we examined the proportion of high CU (as rated by the majority of reporters; $N = 16$) versus low CU ($N = 39$) children with insecure attachment representations. For children with high CU traits; 75% had an insecure attachment (56% with disorganised representations and 19% with avoidant representations). For children with low CU traits; 38% had an insecure attachment (28% with disorganised representations and 10% with avoidant representations).

Discussion

We examined the relationship between CU traits and attachment representations in children with early-onset

<p>| Table 3 Logistic regression predicting attachment classifications from age, mothers’ education, and callous-unemotional traits |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Insecure attachment</th>
<th>Avoidant attachment</th>
<th>Disorganised attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.23</td>
<td>.80</td>
<td>.54</td>
</tr>
<tr>
<td>Mo education</td>
<td>-.44</td>
<td>-.64</td>
<td>.66</td>
</tr>
<tr>
<td>CU traits</td>
<td>.02</td>
<td>1.02</td>
<td>.01</td>
</tr>
</tbody>
</table>

CU, callous-unemotional; Mo, mother.

†$p < .06$, *$p < .05$, **$p < .01$. 

Table 4 Linear regression predicting disorganisation (continuous scores) from age, mothers’ education, and callous-unemotional traits

<table>
<thead>
<tr>
<th>Variable</th>
<th>Disorganisation</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>b</td>
<td>R²</td>
</tr>
<tr>
<td>Age</td>
<td>-.42**</td>
<td>-.45**</td>
<td></td>
</tr>
<tr>
<td>Mo education</td>
<td>-.17</td>
<td>-.16</td>
<td></td>
</tr>
<tr>
<td>CU traits</td>
<td>.22</td>
<td>.24†</td>
<td>.22**</td>
</tr>
</tbody>
</table>

CU, callous-unemotional; Mo, mother.
*p < .06. *p < .05. **p < .01.

conduct problems. A hallmark of adult psychopathy is an inability to form genuine attachments to others; we were unable to locate, however, any research on attachment in young antisocial children with psychopathic-like features. The results provide the first evidence of an association between CU traits and insecure attachment in boys clinic-referred for their antisocial behaviour. We expected CU traits to be related to both avoidant and disorganised attachment styles; contrary to expectations, we did not find an association between levels of CU traits and avoidant attachment representations. Those with higher levels of CU traits were more likely to have disorganised representations of parent-child attachment relationships; independent of the effects of age and caregivers’ level of education. It appears that it is the lack of organisation and coherence in attachment schemas that is most significant for higher levels of CU traits in antisocial children.

These results are consistent with previous studies demonstrating a link between poorer quality of parent-child relationships and higher levels of CU traits (e.g. Fite et al., 2008; Pardini et al., 2007; Schneider et al., 2003), and extends on this work by examining the attachment relationship through the ‘eyes’ of the children themselves. Our findings are consistent with the reported association between early attachment experiences/behaviours and CU traits in youth with a history of severe institutional deprivation (Sonuga-Barke et al., 2010). Our results show that high CU/conduct-problem children raised in relatively typical family environments also exhibit disturbed attachment relationships. The finding that children higher on CU traits construct less meaningful representations of emotional interactions with their caregivers, is consistent with previous demonstrations of their impairments in attending to, recognising, and responding to other people’s emotions – including emotional stimuli conveyed by their attachment figures (Blair, 1999; Dadds et al., 2011; Kimonis et al., 2006).

Unlike two prior MCAST studies (Futh et al., 2008; Green et al., 2007), we did not find an association between disorganised attachment representations and severity of conduct problems (when testing for potential covariates). The association we found between disorganised representations and higher levels of CU traits was independent of conduct problem severity. This is most likely due to a truncated range of conduct problem severity in this clinic-referred sample, but is consistent with the concept of attachment representations as operating primarily in terms of affective-interpersonal traits rather than enacted behaviour (Bowlby, 1982). Moreover, previous MCAST studies have found associations between disorganisation scores and correlates of CU traits; namely low levels of prosocial behaviour (Futh et al., 2008) and emotion recognition deficits (Colle & Del Giudice, 2011). Although the present findings were independent of children’s psychopathology; i.e. symptoms of behavioural and emotional disorders, it is possible that CU traits might be operating as a proxy for other risk factors more potently linked to disorganised attachment that were not measured here. Future research should carefully examine whether there are third variables that may better account for associations between CU traits and attachment.

There are bi-directional influences between parent-child processes and CU traits (Hawes, Dadds, Frost, & Hasking, 2011), as well as genetic effects on the development of childhood CU traits (Viding et al., 2005). It is likely that there are reciprocal forces operating between CU traits (and its correlates) and attachment across critical stages of child development. For instance, it is possible, as suggested by the abovementioned findings from the ERA sample (Sonuga-Barke et al., 2010), that early attachment disturbances may impair children’s ability to reflect on and appropriately respond to other people’s emotional states (Fonagy, 2003; Van Ijzendoorn, 1997), increasing the risk for CU traits. It is also possible that neurocognitive impairments associated with CU traits, such as deficits in emotional learning (Blair, 2005) and eye contact (Dadds et al., 2011), could interfere with attachment processes at the dyadic (e.g. by disrupting emotional reciprocity between children and their caregivers), and representational levels (e.g. by influencing children’s processing of attachment-related information). Moreover, disrupted attachment might amplify negative effects of temperamental fearlessness on socialisation processes implicated in the development of CU traits (Barker, Oliver, Viding, Salekin, & Maughan, 2011; Saltaris, 2002). Given the broad nature of risk and outcome factors associated with disorganised attachment (Green & Goldwyn, 2002), and the paucity of attachment research with high CU children; it is difficult to be more precise about the developmental mechanisms that might contribute to disorganised patterns of attachment in these children. A priority for research should be a longitudinal study of CU traits and attachment relationships across childhood.

It is also important to note that 25% of the conduct-problem children in this study rated ‘high CU’ by multiple informants showed secure representations of attachment relationships. Thus, it appears that for this relatively small subgroup of antisocial children, a secure state of mind regarding attachment relationships does not necessarily protect...
against the development of more severe levels of CU traits. In contrast, it is also possible that the high levels of CU traits in this group of children are more strongly under the influence of more recent difficulties in the parent-child relationship; which are yet to impact on children’s internalised attachment representations. As such, this group of antisocial children might have elevated levels of CU traits that are less entrenched and more amenable to psychosocial interventions (Hawes & Dadds, 2007).

There are some important limitations of this study. First, in line with previous research using the MCAST (Green et al., 2007), only a small group of children with insecure attachment representations were classified as avoidant, restricting our ability to make firm conclusions regarding the association between CU traits and avoidant representations. Second, we only examined children’s representation of the mother-child attachment relationship. The overlap between classifications of mother-child and father-child attachment representations is modest (Verschueren & Marcoen, 1999); therefore it is possible that children’s representation of the father-child attachment relationship may relate differently to levels of CU traits. Third, our sample only consisted of boys that had been clinic-referred, so our findings may not generalise to girls and more typically developing children. Fourth, the mothers in this study were relatively well-educated, and it is unclear whether this had an influence on the prevalence of insecure attachment. The frequency of children with disorganised representations in this study was somewhat lower than in a previous study using the MCAST with conduct-problem children (36% vs. 58% respectively) (Green et al., 2007) and there was a trend towards lower maternal education equating to a greater likelihood of disorganised representations. Finally, we gathered clinician’s reports of the overall quality of the family environment; but did not have more specific measures of familial risk factors, such as negative parenting behaviours and child maltreatment, to include as potential confounds.

In summary, our data suggest that young antisocial children with high CU traits are at increased risk for attachment disturbances, specifically disorganised representations. Drawing on seminal findings from previous research into the development of conscience in fearless children (Fowles & Kochanska, 2000; Kochanska, 1997), we hypothesise that a failure of emotional reciprocity and mutual co-operation associated with secure parent-child attachment (Isabella & Belsky, 1991), may, in part, underlie impairments in empathic and moral development in children elevated on CU traits. As such, attachment may represent an important target for treatment and prevention of CU traits. Given that the formation and internalisation of attachment relationships occurs in the first few years of children's development (Bowlby, 1982), these results focus the need for early intervention efforts in young at-risk children.

Supporting information
Additional Supporting Information may be found in the online version of this article:
- Appendix S1 Descriptive statistics for callous-unemotional traits in Pasalich et al. (present study) compared to Dadds et al. (2005) community sample.
- Appendix S2 Correlations among callous-unemotional traits and insecure attachment, and demographics and child behavioural and emotional problems.

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Key points
- Antisocial children with elevated levels of callous-unemotional (CU) traits appear to be disconnected from other people’s emotions; yet little is known about early attachment experiences in these children.
- Here we show that in young boys with disruptive behaviour disorders, those with higher levels of CU traits have an increased likelihood of insecure attachment representations.
- More specifically, disorganised and not avoidant representations are associated with elevated levels of CU traits.
- The parent-child attachment relationship may be an important target for family-centred intervention and prevention efforts for childhood CU traits.
References


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