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Callous-Unemotional Behaviors in Early Childhood: The Development of Empathy and Prosociality Gone Awry

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Abstract

Callous-unemotional (CU) behaviors are critical to understanding the development of severe forms of aggression and antisocial behavior. CU behaviors include deficits in empathy and prosocial behavior, as well as reduced interpersonal responsivity to others. We review recent research examining CU behaviors in early childhood and the role that parents play in the development of early CU behaviors. We integrate research on the development of empathy and prosociality with that of CU behaviors to propose a developmental model of early CU behaviors considering person-context interactions.

Introduction

Empathy involves the vicarious experience of another person's distress, which can precipitate prosocial acts of help. Both empathy and prosociality (e.g., helping behaviors) are fundamental to moral and social behavior [1]. Developmental research has established that children's empathic concern for others and displays of prosocial behavior emerge by the second year of life [2–4]. In parallel, developmental psychopathology research has focused on the ways in which deficits in these processes lead to childhood antisocial behavior. Specifically, research has examined callous-unemotional (CU) behaviors, defined by low empathy and limited prosociality [5]. In the current paper, we integrate these two literatures and describe emerging research examining CU behaviors in early childhood. We discuss the consequences of early CU behaviors and the risk factors implicated in the etiology of CU behaviors, including parenting and child temperament. Finally, we propose a model to explain how early CU behaviors arise and evaluate CU behaviors as a marker of disrupted development of empathy and prosociality.

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Callous-Unemotional Behaviors in Early Childhood

Most research on CU behaviors has focused on adolescents and school-aged children. However, recent studies have begun assessing CU behaviors in early childhood (before age 5) either via standard measures used with older-aged children [6–8] or using items from parent-reported scales that assess low empathy and guilt, uncaring about others, and low emotional responsivity [9,10]. This research shows that CU behaviors assessed as young as age 3 predict concurrent and future behavior problems. For example, across multiple prospective, longitudinal studies, CU behaviors at age 3 predicted later school-aged aggression (up to age 10) assessed via teacher report [9–11], and one study found this longitudinal link even when taking into account the stability of aggressive and oppositional behaviors and potential informant rater effects/bias [12]. Beyond predicting an escalation in behavior problems, CU behaviors show a unique set of correlates relative to those of oppositional and attention deficit behaviors, including lower empathy and guilt, which suggests that the CU construct does not simply index greater severity in behavior problems [9]. Finally, CU behaviors at age 3 have been shown to predict a measure of CU behaviors at age 9.5, emphasizing the homotypic continuity of the CU construct across childhood [12]. Together, these studies suggest that by 3 years old, measures of CU behaviors correlate with deficits in empathy and conscience and identify children at risk for chronic behavior problems across childhood.

Heritable and Non-Heritable Pathways to Early CU Behaviors

Given the lasting negative consequences of early CU behaviors, it is important to understand how they develop. A large developmental literature has linked parenting to the development of empathy and prosocial behavior [3,13,14]. For example, attachment security at age 3 was shown to predict increases in children's empathy at age 4 [15], and in another study, parental warmth and sympathy predicted increases in prosocial behavior in late-childhood [16]. Warm parenting is thought to encourage and scaffold emotional expression and sensitivity, and increase the likelihood that children internalize parental messages about empathy and prosociality [14]. For example, "Mutually Responsive Orientation", defined as a close, warm, and mutually cooperative parent-child relationship, appears particularly important for promoting the development of empathy and conscience [17]. In contrast, harsh or rejecting forms of parenting likely interfere with children's ability to internalize rules and develop conscience [18]. Moreover, negative parent-child relationships appear to amplify the risk that the development of empathy and conscience could fail, particularly among children who are difficult or challenging to manage [18,19].

Consistent with this normative developmental literature, a systematic review of 30 studies found that during late-childhood and adolescence, parenting is correlated with CU behaviors [20]. Recent studies have also begun to investigate the relationship between parenting and CU behaviors during the preschool period, when individual differences in empathy and prosocial behavior emerge [2–4]. These studies show that greater parental warmth predicts decreases in CU behaviors across the preschool period [21–23], whereas parental harshness at age 2 predicts increases in CU behaviors at ages 4 [24] and 6 [22]. However, it is important to consider that parenting does not occur in a vacuum and is likely influenced by

the broader context. For example, both low socioeconomic status [25] and neighborhood deprivation [26] predicted CU behaviors in late-childhood. Similarly, neighborhood impoverishment and maternal traits (aggressiveness and low empathy) predicted CU behaviors in late-childhood via their influence on observed maternal warmth at age 2 [27]. This latter study suggests that broader negative contexts can undermine child socioemotional development via effects on parenting [27]. In sum, growing evidence suggests that both harsh and warm early parenting practices, as well as the broader context of the parent-child relationship, are important for understanding why CU behaviors develop [28].

At the same time, genetically-informed studies suggest at least moderate heritability of CU behaviors in early childhood [29], similar to empathy [30] and prosociality [31]. Thus, the links between parenting and CU behavior could reflect gene-environment correlations (i.e., parents low on warmth pass on genes that increase risk for CU behaviors), implying that parenting may simply be a correlated but “non-causal” variable. To address this confound, a recent study used an adoption design to separate the contributions of genetic and environmental influences. Biological mothers’ antisocial behavior predicted child CU behaviors at 27 months, suggesting that CU behaviors arise, to some extent, via heritable pathways [32]. However, low positive parenting of adoptive mothers at 18 months also predicted CU behaviors when children were 27 months old, indicating non-heritable effects and supporting the idea that parenting is an environmentally-mediated predictor of CU behaviors. Crucially, this same study found a gene-by-environment interaction in which the antisocial behavior of biological mothers only predicted adopted child CU behaviors when adoptive mothers showed low positive parenting. Thus, this study supports the assertion that parenting is critical to the development of early CU behaviors [20], and highlights the notion that CU behaviors develop through a complex interplay between genes and environment.

Temperament Precursors of Early Childhood CU behaviors

Given evidence for heritable pathways to CU behaviors, it is important to identify specific temperamental factors that may be inherited, emerge early, and signal risk for CU behaviors. Across several recent studies, early temperamental markers of CU behaviors have been identified. For example, reduced face preference at 5 weeks old [33] and low baseline sinus arrythima (thought to influence social behaviors) measured across 3-24 months [34] predicted increases in CU behaviors in early childhood. In addition, among clinic-referred 4-year-olds, children with CU behaviors showed lower affection and eye contact with parents relative to both healthy control children and those with behavior problems only [35]. Finally, CU behaviors in early childhood were related to poorer recognition of interpersonal emotions in two recent studies [8,36].

Together these findings suggest that impairments in attending to, recognizing, and responding to interpersonal emotions as early as infancy may increase risk for CU behaviors. These impairments could contribute to deficits in the development of *affective empathy*. Empathy is commonly divided between emotionally resonating with the feelings of another (i.e., affective empathy) versus understanding the perspective of another (i.e., cognitive empathy). Evidence suggests that children high on CU behaviors have intact cognitive but impaired affective empathy during the preschool period [9] and late-childhood [37]. Thus,

the failure of children with CU behaviors to act prosocially could result from a specific deficit in affective empathy arising from low interpersonal emotional sensitivity. This premise is supported by research in typically-developing children where greater affective empathy at 10 months of age predicted higher prosocial behavior at 2 years old [38]. Moreover, the notion that interpersonal emotional sensitivity precedes affective empathy and promotes prosociality is consistent with developmental theory on early empathy development [1]. Specifically, children are thought to be born with the capacity to "feel" others' distress [1], manifested from birth via numerous mechanisms that grow in complexity across development from reactive crying in infancy [39] to facial expressions and vocalizations indicating concern by age 2 [2]. Thus, CU behaviors may emerge, in part, from low affective empathy resulting from early deficits in these basic emotional sensitivity processes [30,40].

In addition to emotional responsivity, a second temperament relevant for understanding CU behaviors is low fear. Fear is thought to readily capture attention and inhibit behavioral approach to threat [41,42]. CU behaviors are hypothesized to emerge from a "fearless" temperament [43], a hypothesis supported by longitudinal evidence linking child fearlessness at ages 2-3 to CU behaviors in adolescence [25] and psychopathy in adults [44]. These findings have been taken to suggest that early fearlessness confers low arousal to threat, which undermines learning about the consequences of behavior, thus increasing risk for CU behaviors [43]. Moreover, low fear to threat could lead to high approach, reward dominance, and low sensitivity to punishment, which typically characterize children high on both aggression and CU behaviors [5,43]. As evidence that fearlessness is an early emerging and *heritable* temperament that leads to CU behaviors, a recent study using an adoption sample found that biological parent fearlessness predicted observations of adopted child fearlessness at 18 months, which in turn predicted higher CU behaviors at 27 months [45].

Person-by-Context Interactions in the Development of Early CU behaviors

Drawing research on parenting and child temperament together, studies suggest that interactions between child temperament and parenting are critical in the development of moral emotions [17,18]. For example, non-assertive parental discipline in toddlerhood predicted conscience development at age 10 among fearful, but not fearless, children [18]. Moreover, among children rated as *fearful* at age 4 based on *high* electrodermal reactivity, gentle maternal discipline predicted conscience development, whereas attachment security predicted conscience development children rated as *fearless* who showed *low* electrodermal reactivity [46]. These studies suggest that inherited child characteristics interact with caregiving to shape the development of empathy and prosocial behavior and that person-context fit may be particularly important in the development of prosocial behaviors.

Similar person-by-context interactions are now being identified in the etiology of CU behaviors. For example, in two independent samples, observed fearlessness at 18 months predicted later CU behaviors, but only among children who experienced low positive parenting [45,47]. Thus, highly positive parenting buffered the risk that fearlessness posed to the development of CU behaviors. In addition, harsh caregiving was more strongly associated with CU behaviors at age 3 among children with a genetic allele thought to

impair fear conditioning (met allele in *BDNF*) [48]. In this example, parental harshness exacerbated genetic risk for fearlessness, which in turned increased risk for CU behaviors. Together, this emerging literature highlights that child temperament interacts with parental caregiving to increase or buffer risk for CU behaviors.

Developmental Model of Early CU behaviors

Based on this literature, we propose that early CU behaviors arise in the context of inherited temperament risk for both low interpersonal emotional sensitivity [33,34,45] and fearlessness [25,45,48] (see **Graphical Abstract**). In turn, these temperament precursors interact with parenting that is harsh and low in warmth to further increase risk for CU behaviors [18,45,47,48]. Specifically, we hypothesize that CU behaviors arise from the interaction of two heritable pathways: *(1) Inherited low interpersonal emotional sensitivity* sets the foundation for failure to develop affective empathy, operationalized via low emotional contagion in infancy, and fewer facial or verbal expressions of concern for others' distress, low positive affect, and eye contact deficits from age 2 onwards; *(2) Inherited fearlessness* sets the foundation for a failure to develop behavioral inhibition to threat, including non-social threat (e.g., developmentally-appropriate "scary" stimuli) and social threat (e.g., parental punishment), which lead to high approach, reward dominance, and difficulty learning from punishment. Accordingly, children are less likely, via contingency processes, to learn to associate fear/other aversive emotions with actions that involve risk, cause harm, or invoke punishment, meaning that such actions will be repeated [43]. This combination of low interpersonal emotional sensitivity and fearlessness is most risky in the context of parental harshness or low warmth (i.e., person-by-context interactions). In particular, reciprocal parent-child interactions occur over time that exacerbate risk for CU behaviors (i.e., temperamentally fearless children evoke harsher parenting; children low on interpersonal emotional sensitivity evoke less warm parenting). Of course, beyond these two hypothesized pathways, other temperament factors are likely important for understanding how CU behaviors give rise to more severe forms of antisocial behavior and psychopathy across the lifespan, including poor executive function and disinhibition/impulsivity [42,49]

Conclusions

CU behaviors in early childhood predict behavior problems across childhood, tapping a construct involving low empathy and limited prosociality. Early CU behaviors appear to be both heritable and non-heritable in origin, with parenting practices serving a critical component of the person-by-context interactions implicated in the development of CU behaviors. Recent research suggests that CU behaviors emerge from the combination of low interpersonal emotional sensitivity and fearlessness, temperaments that appear to be inherited and subsequently interact with parenting. This work is consistent with basic developmental studies that report similar child-parent interactions as fundamental to the development of affective empathy and prosociality, suggesting shared mechanisms in the development of these attributes (i.e., that CU behaviors are, at least partially, the "other side of the coin" from affective empathy). Ultimately, the study of CU behaviors in early childhood can inform our understanding of the development of severe antisocial behavior

and psychopathy across development, and can be guided by our understanding of the normative and atypical development of moral behaviors, such as empathy and prosociality.

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Highlights

- Callous-unemotional (CU) behaviors predict more severe childhood behavior problems
- Parenting practices predict the development of CU behaviors in early childhood
- Inherited traits contribute to CU behaviors via child-context interactions
- We offer a developmental model for CU behaviors beginning in infancy