

Multiple Developmental Pathways to Conduct Disorder: Current Conceptualizations and Clinical Implications

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Abstract

Objectives: Recent research has uncovered several developmental pathways through which children and adolescents can develop a tendency to display the severe antisocial behavior associated with the diagnosis of conduct disorder (CD). **Methods:** This focused review is designed to briefly outline three different etiological pathways described in the literature. These pathways are distinguished by the age of onset of the antisocial behavior, the presence/absence of significant levels of callous-unemotional traits, and the presence/absence of problems with anger regulation. **Results:** Evidence from developmental psychopathology research (particularly longitudinal studies) that support the different life-course trajectories and putative etiological factors associated with antisocial behavior across these pathways is presented. **Conclusions:** Limitations in the available research on these developmental pathways and implications of this research for the prevention and treatment of children and adolescents with CD are discussed.

Key Words: *conduct disorder, developmental pathways, children, adolescents*

Résumé

Objectifs: La recherche récente a découvert plusieurs trajectoires développementales par lesquelles les enfants et les adolescents peuvent développer une tendance au comportement antisocial sévère associé au diagnostic du trouble des conduites (TC). **Méthodes:** Cette étude ciblée est destinée à présenter brièvement trois différents modèles de trajectoires étiologiques décrits dans la littérature. Ces trajectoires se distinguent par l'âge d'apparition du comportement antisocial, la présence ou l'absence de degrés significatifs de traits de dureté-insensibilité, et la présence ou l'absence de problèmes de régulation de la colère. **Résultats:** Les données probantes de la recherche sur la psychopathologie développementale (en particulier les études longitudinales) qui soutiennent les différentes trajectoires de parcours de vie et les facteurs étiologiques présumés associés au comportement antisocial dans ces trajectoires sont présentées. **Conclusions:** Les limitations de la recherche disponible sur ces trajectoires développementales et les implications de cette recherche pour la prévention et le traitement des enfants et adolescents souffrant du TC sont discutées.

Mots clés: *trouble des conduites, trajectoires développementales, enfants, adolescents*

Conduct disorder (CD) is defined as a repetitive and persistent pattern of behavior which violates the rights of others or major age-appropriate societal rules (American Psychiatric Association, 2000). Over the last several decades, it has become apparent that there are multiple causal factors that underlie the behavioral manifestations of CD in children and adolescents. While causal heterogeneity is common to all psychiatric disorders, the myriad of different etiological factors linked to CD is striking (e.g., genetic, neurocognitive, temperamental, peer, family). However, recent developmental psychopathology research has provided evidence documenting unique pathways associated with the

emergence and continuity of CD over time. While a number of developmental models of CD have been proposed (e.g., Dodge & Pettit, 2003), the current article is designed to briefly overview three differing etiological pathways to CD. These models are based upon:

1. the developmental timing of CD symptom emergence;
2. the presence of callous-unemotional (CU) traits; and,
3. the presence of severe anger dysregulation.

Interested readers can find more in-depth and comprehensive reviews of these models elsewhere (Frick & Viding, 2009; Moffitt, 2006).

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Taxonomy of CD based on timing of onset

One of the most enduring subtyping schemes of CD is based on longitudinal research indicating that youth with conduct problems initiated in childhood (i.e., childhood-onset) are at heightened risk for exhibiting persistent criminal behavior into adulthood. Youth who develop childhood-onset CD often have longstanding problems related to attention-deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) that emerge prior to their first CD symptom (Moffitt, 2006). Evidence suggests that the transition to early CD is caused in part by subtle neurological deficits (e.g., deficit inhibitory control, poor verbal abilities) that lead to difficulties managing peer conflicts, regulating emotions, and controlling impulses (Moffitt, 2006). In addition to these cognitive problems, youth with childhood-onset CD often come from families with a longstanding history of antisocial behavior that use harsh/inconsistent discipline practices (Odgers et al., 2008), which makes it difficult for these children to acquire appropriate social skills and internalize rules for appropriate conduct. Moreover, childhood-onset CD youth tend to experience escalating academic and peer difficulties over time (Moffitt, 2006; Odgers et al., 2008). This cascade of accumulating risk factors impedes these youth from making important life transitions (e.g., graduating) serving to further entrench them into a criminal lifestyle (Moffitt, 2006; Odgers et al., 2008).

In contrast to the childhood-onset pathway, there is a larger group of youth who do not begin exhibiting delinquent behaviors until adolescence (i.e., adolescent-onset). These youth often do not exhibit ADHD or ODD in childhood, and are less likely to have early neurological impairments and severe family dysfunction (Moffitt, 2006; Odgers et al., 2008). Instead, evidence suggests that adolescent-onset CD emerges in part when rebellious adolescents are poorly monitored by their parents and begin affiliating with delinquent peers (Moffitt, 2006). Adolescent-onset CD youth are posited to be more likely to leave their antisocial ways behind during the transition into adulthood, as they adopt prosocial roles (e.g., employment), spend less time with deviant peers, and engage in more mature decision-making. However, recent evidence suggests that many adolescent-onset youth continue to engage in criminal behavior and experience impairments in several life domains well into early adulthood (Odgers et al., 2008).

Because early-onset CD symptoms have been consistently associated with a persistent form of antisocial behavior, a childhood-onset subtyping scheme was added to the diagnosis of CD in DSM-IV, and is proposed to be retained in the upcoming DSM-5 (Frick & Nigg, 2012). However, there are limitations associated with relying solely on this dual developmental taxonomy. Specifically, it has become clear that a significant portion of childhood-onset youth

desist from crime by early adulthood (Odgers et al., 2008). There also remains considerable etiological heterogeneity within childhood-onset CD cases (Frick & Viding, 2009). Therefore, researchers have sought to further refine this subtyping scheme to identify more homogenous groups of youth in terms of causal mechanisms and developmental outcomes.

CD with callous-unemotional traits

One promising method for further distinguishing an etiologically unique group of children with childhood-onset CD involves identifying callous-unemotional (CU) features. Consistent with the affective dimension of adult psychopathy, CU traits include a lack of concern for others' feelings, deficient guilt and remorse, and shallow affect. The estimated prevalence of high CU traits in youth with CD ranges from 10-46% in community samples to 21-59% in clinic-samples (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Kolko & Pardini, 2010; Rowe et al., 2010). Accumulating evidence indicates that youth with elevated CU traits are at risk for exhibiting severe and persistent antisocial behavior, even after controlling for co-occurring disruptive behavior disorder symptoms (Frick, Cornell, Barry, Bodin, & Dane, 2003; McMahon, Witkiewitz, Kotler, & Conduct Problems Prevention Research Group, 2010; Pardini & Fite, 2010). As a result, these traits seem to further delineate childhood-onset CD cases that are more likely to persist in their antisocial behavior into adulthood.

There also appears to be unique causal factors underlying the conduct problems found in children with CU traits, such as low temperamental fear. Longitudinal studies have consistently linked low fearful arousal to the development of severe antisocial behavior, particularly violence (Loeber & Pardini, 2008). Moreover, infants and children with a relatively fearless temperament exhibit impairments in the development of empathy and guilt (Fowles & Kochanska, 2000), in part because they seem to experience relatively little emotional arousal in response to distress cues in others or to cues of punishment for misbehavior (Frick & Viding, 2009). Together, these findings suggest that low temperamental fear may lead to the development of early conduct problems because it reduces the effectiveness of punishment-oriented socialization techniques and fosters the development of CU traits (Pardini, 2006). Consistent with this theoretical model, children with CU traits show impairments when processing cues of fearful distress in others (Marsh & Blair, 2008), possibly due to deficits in attending to emotionally salient facial features (Dadds et al., 2006). They also tend to make less eye contact with caretakers when involved in emotion discussions (Dadds et al., 2012), which may interfere with early moral socialization.

While much of the research aimed at understanding the development of CU traits has focused on child characteristics, caregiver affection/warmth may protect children from

developing CU traits over time. Maternal emotional responsiveness during infancy has been associated with higher levels of empathy (Kiang, Moreno, & Robinson, 2004) and guilt (Kochanska, Forman, Aksan, & Dunbar, 2005) in childhood. A warm and involved parent-child relationship has also been shown to protect aggressive children with low fear from experiencing increases in CU traits over time (Pardini, Lochman, & Powell, 2007) and seems to buffer children with high CU traits from developing more serious conduct problems (Kroneman, Hipwell, Loeber, Koot, & Pardini, 2011; Pasalich, Dadds, Hawes, & Brennan, 2011).

Taken together, these studies suggest that children who follow a CU pathway to early-onset CD exhibit low temperamental fear and deficits in attending to salient emotional social cues, which can interfere with various socialization processes designed to facilitate the development of moral emotions. Specifically, children with these characteristics tend to experience little aversive arousal when being punished, overlook cues of suffering in others, and are difficult to engage in emotional discussions. However, exposure to a warm and nurturing caregiver may protect children from developing CU traits over time, even if they have a relatively fearless temperament.

CD with severe anger dysregulation

Developmental studies have also begun to support another causal pathway to early-onset CD that involves problems with severe anger dysregulation. Specifically, children with conduct problems in the absence of CU traits tend to exhibit high temperamental negative emotionality and elevated levels of internalizing problems (Hipwell et al., 2007; Pardini, Lochman, & Frick, 2003). Moreover, evidence suggests that difficulties regulating anger are particularly important for understanding the development of early conduct problems. For example, high temperamental anger in infants and children has been associated with the development of later aggression and conduct problems (Arsenio, Cooperman, & Lover, 2000; Lengua & Kovacs, 2005; Rothbart, Ahadi, & Hershey, 1994), and dysregulated anger represents a core feature of ODD, which is a developmental precursor to early-onset CD (Stringaris, 2011). Social-cognitive research suggests that children with high levels of anger tend to over-interpret ambiguous social cues as threatening (Schultz, Izard, & Bear, 2004), which may lead them to engage in defensive forms of aggression in response to minor provocation (Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Importantly, hostile attribution biases and elevated reactive aggression often occur in conduct problem children without CU traits (Frick et al., 2003).

While problems with dysregulated anger may be partially driven by neurobiological factors, exposure to harsh and abusive parental discipline can also play a role. Exposure to

harsh discipline has been consistently linked to the development of antisocial behavior (Gershoff, 2002), particularly among children with low CU traits (Pasalich et al., 2011). Additionally, children who are exposed to high levels of harsh discipline tend to have difficulties developing appropriate emotion regulation skills (Shields & Cicchetti, 1998), and exhibit an increased hypervigilance to cues of potential threat in others (Dodge, Bates, Pettit, & Valente, 1995; Pol-lak & Sinha, 2002). While exposure to harsh discipline may facilitate the development of early conduct problems by interfering with the development of anger regulation abilities, this association seems to be moderated by genetic factors. Specifically, recent studies indicate that early maltreatment is linked to the development of antisocial behavior predominantly in children possessing a gene associated with low levels of monoamine oxidase A (*MAOA*) enzyme activity (Taylor & Kim-Cohen, 2007).

In sum, children with anger regulation problems often exhibit early oppositional/defiant behaviors, which tend to precede the development of CD in childhood. Youth with high levels of anger also tend to have a hostile attribution bias when encoding cues of potential threat, which can perpetuate interpersonal conflicts with others. Finally, while early exposure to abusive discipline practices may be a particularly important etiological factor in the development of anger regulation difficulties, this may only occur in youth possessing certain genetic risk factors.

Clinical implications and future directions

Given the research outlined above, one way to conceptualize developmental pathways to CD is to first differentiate between childhood- and adolescent-onset CD, and then distinguish those childhood-onset youth with high CU traits and those with severe anger dysregulation. These pathways appear to be quite promising for guiding future research into the etiology of antisocial behavior. However, there remain many aspects of these models that have not been sufficiently tested. Moreover, there are several unanswered questions about how to best use the models to guide clinical practice. A few key areas that are ripe for future study include:

1. refining clinical diagnosis; and,
2. developing innovative prevention and treatment interventions.

Refining diagnostic criteria

One timely issue is whether to incorporate features of CU traits and severe anger dysregulation into the upcoming DSM-5 classification system. There is currently a proposal to add a specifier to the diagnosis of CD (i.e., with limited prosocial emotions) to designate those with high levels of CU traits (Pardini, Frick, & Moffitt, 2010). Initial tests of this specifier have been promising. Children with CD who

meet criteria for the specifier tend to have higher levels of aggressive and cruel behaviors compared to youth with CD alone (Kahn et al., 2012). In terms of predictive utility, young girls who meet criteria for the specifier have been shown to exhibit more bullying and CD symptoms at a six-year follow-up than girls with childhood-onset CD alone (Pardini, Stepp, Hipwell, Stouthamer-Loeber, & Loeber, 2012). Adolescents who meet diagnostic threshold for the specifier also appear to be at high risk for exhibiting antisocial and criminal behavior into adulthood (McMahon et al., 2010). However, issues regarding the optimal methods for assessing CU traits at different ages and dealing with discordant information across multiple informants still need to be addressed.

There is currently no proposed method for delineating a subgroup of children with CD who have severe anger dysregulation for DSM-5. However, allowing for co-morbid diagnoses of ODD and CD, and labeling three symptoms of ODD as an angry/irritable dimension may aid in this respect (Frick & Nigg, 2012). A more controversial proposal is to add a new diagnosis of disruptive mood dysregulation disorder (DMDD) to DSM-5 defined by persistent irritability and impulsive outbursts of aggression that could be diagnosed in conjunction with CD (Stringaris, 2011). However, the proposed diagnosis was not explicitly designed to help delineate a more etiologically homogenous group of youth with childhood-onset CD.

Targeted prevention and intervention strategies

While a number of interventions have proven effective in treating early emerging conduct problems, the effectiveness tends to decrease in older children and adolescence. Thus, intervening early in the developmental trajectory of childhood-onset CD represents an important avenue for preventing later serious aggression and antisocial behavior. Implementing preventative-interventions with children exhibiting significant oppositional defiant behaviors, dysregulated anger or early CU traits during the pre-school years (prior to the onset of serious CD symptoms) seems particularly important. Given the large number of risk factors across multiple domains that have been associated with the development of early-onset CD, effective preventative-interventions should be capable of providing a comprehensive array of services to families that target multiple risk factors. However, it is also important to individualize these programs to effectively target the specific developmental mechanisms underlying each child's antisocial behavior.

Research on the various developmental pathways to antisocial behavior could be important for guiding individualized treatment approaches for children with CD. For example, interventions that focus on anger control and reducing harsh and inconsistent discipline may be more effective for CD children with severe anger dysregulation (Lochman &

Wells, 2004). In contrast, treatments focused on promoting positive parent-child emotional connectedness may be more beneficial for conduct problem children with high CU traits (Thomas & Zimmer-Gembeck, 2007). Given that children with CU traits show relatively low levels of concern about being punished, teaching parents how to use positive reinforcement to encourage prosocial behavior may be particularly beneficial. To date, there is little systematic research testing the utility of matching youth with CD to different types of treatment.

An increased focus on developing treatments that specifically target the characteristics of children with CD and CU traits will be particularly important moving forward, given the severe and persistent nature of their antisocial behavior. Some studies have found that youth with high CU traits exhibit more disruptive behaviors both during and after treatment relative to youth without these traits (Haas et al., 2011; Hawes & Dadds, 2005). However, children with CU traits are by no means "untreatable," particularly when exposed to intensive, empirically-based interventions (Kolko & Pardini, 2010). Importantly, there are now several studies indicating that treatments for young children with conduct problems can lead to reductions in the CU traits over time (Hawes & Dadds, 2007; Kolko et al., 2009; McDonald, Dodson, Rosenfield, & Jouriles, 2011; Somech & Elizur, 2012). These studies promote optimism that it is possible to effectively treat the severe conduct problems found in children with CU traits, as well as reduce overall levels of CU features in conduct problem youth.

While there are now several manualized interventions that have been found to produce behavioral improvements in children with conduct problems, many children continue to exhibit significant behavioral impairments at the end of treatment and positive behavioral gains tend to erode over time. If interventions can be better tailored to the unique characteristics of children based on the developmental mechanisms underlying their conduct problems, more pronounced and sustained treatment effects will likely be achieved. Continued developmental research aimed at uncovering the unique etiological factors underlying the behavior problems of subgroups of youth with CD will help to facilitate future innovations in these comprehensive and individualized approaches to prevention and treatment.

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