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Can a Developmental Psychopathology Perspective Facilitate a Paradigm Shift toward a Mixed Categorical-Dimensional Classification System?

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Abstract

Maser et al. (2009) identify several problems with the categorical *DSM*, and suggest that a shift to a mixed categorical-dimensional system is warranted. Maser et al. support their argument by citing evidence related to mood and anxiety disorders, among other conditions. In this commentary, I consider the applicability of several issues raised by Maser et al. to two disruptive behavior disorders in youth, oppositional defiant disorder (ODD) and conduct disorder (CD). The issues include paradigm shifts concerning (a) the diagnostic threshold, (b) symptoms, and (c) distress/psychosocial impairment. Within each topic, several developmental psychopathology principles that parallel and extend the Maser et al. issues are presented and described. This commentary also provides examples of dimensions that could be useful for conceptualizing ODD and CD within a mixed categorical-dimensional classification system.

Can a Developmental Psychopathology Perspective Facilitate a Paradigm Shift toward a Mixed Categorical-Dimensional Classification System?

Although a variety of criticisms have been voiced regarding *DSM*'s categorical classification system (e.g., Beauchaine, 2003; Jensen & Hoagwood, 1997; Jensen et al., 1997; Kazdin & Kagan, 1994; Wakefield, 1997), many of these criticisms can be addressed by examining psychological difficulties within a developmental psychopathology framework. Such a framework includes consideration of dimensions, multiple levels of analysis, context, and transactional relations between multiple processes (Beauchaine, 2003; Drabick, Gadow, & Sprafkin, 2006; Jensen & Hoagwood, 1997; Rutter & Sroufe, 2000; Steinberg & Avenevoli, 2000). This overlap in terms of concerns with *DSM* and the developmental psychopathology perspective suggests that consideration of developmental psychopathology principles could facilitate addressing some of the limitations of the categorical system. Moreover, given the breadth of research conducted within a developmental psychopathology framework that does not directly map onto *DSM* categories, synthesizing these lines of inquiry could permit us to draw from the developmental psychopathology literature in identifying potential dimensions for psychological conditions and thus facilitate an alternative approach to classification. Maser et al. (2009) suggest that psychiatric nosology is ready for a shift from a purely categorical to a mixed categorical-dimensional system in *DSM-V* and cite evidence supporting this proposition for several mood and anxiety disorders, among other conditions. This commentary extends several issues identified by Maser et al. to two disruptive behavior disorders, oppositional defiant disorder (ODD) and conduct disorder (CD).

Diagnostic Issues Associated with Oppositional Defiant Disorder and Conduct Disorder

ODD, which involves a pattern of negativistic, hostile, and defiant behavior toward adults, is a common precursor for and may represent a prodromal form of CD (Burke, Loeber, & Birmaher, 2002; Lahey, Loeber, Quay, Frick, & Grimm, 1992; Moffitt, 1993). CD is characterized by a pattern of behavior in which the basic rights of others or age-appropriate societal norms are violated, and may involve aggression, property destruction, deceitfulness or theft, and serious rule violations. There is evidence that ODD and CD may be hierarchically organized levels of the same underlying pathology (e.g., most youth with CD previously met diagnostic criteria for ODD; Burke et al., 2002; Lahey & Loeber, 1994; Lahey, Waldman, & McBurnett, 1999). However, children with ODD do not necessarily progress to CD (Loeber, Burke, Lahey, Winters, & Zera, 2000; Rowe, Maughan, Pickles, Costello, & Angold, 2002), suggesting some discontinuity between the disorders.

There continues to be disagreement and discussion in the literature regarding the relations between ODD and CD (Loeber et al., 2000). In addition to empirical support for distinguishing ODD and CD, the ODD/CD distinction has been maintained because of several diagnostic and prognostic benefits (Lahey et al., 1992, 1999; Loeber et al., 2000). Moreover, the symptoms appear to represent different processes; ODD includes more symptoms related to child temperament and interpersonal functioning, and CD includes more behavioral symptoms (Burke, Loeber, Lahey, & Rathouz, 2005). Indeed, based on *DSM* exclusion criteria, a child who meets diagnostic criteria for CD cannot receive a diagnosis of ODD also (American Psychiatric Association, 2000). Nevertheless, use of this exclusion criterion masks the high rates of overlap between ODD and CD (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004), which can be problematic for a categorical system that purports to identify distinct syndromes (Beauchaine, 2003).

Evidence suggests that ODD and CD are closely related in taxonomic and developmental terms (Lahey & Loeber, 1994; Lahey et al., 1999; Rowe et al., 2002) and some behaviors (e.g., aggression) potentially could be considered part of both syndromes (for a review, see Loeber et al., 2000; Maughan et al., 2004). For these reasons, ODD and CD are often considered concurrently (e.g., Angold, Costello, & Erkanli, 1999; Clark, Prior, & Kinsella, 2000); however, a failure to examine these disorders separately confounds conclusions that can be drawn regarding the degree to which ODD and CD are related to, or can be differentiated from, each other. In addition, many researchers focus on either particular behaviors within these syndromes (e.g., aggression) or broader categories that subsume a range of disruptive behaviors (e.g., externalizing behavior problems), which further limits conclusions regarding ODD and CD specifically. Much of the research that has been conducted within a developmental psychopathology framework would apply to a categorical-dimensional system. Thus, the mixed categorical-dimensional system proposed by Maser et al., though not necessarily novel to childhood conditions, could serve to integrate multiple lines of inquiry and consequently inform our understanding of ODD and CD.

The framework proposed by Maser et al. (2009) provides several useful insights for addressing extant issues related to the current *DSM* approach to ODD and CD. Further, when considered within a developmental psychopathology framework, additional considerations can be highlighted that provide a broader foundation for a mixed categorical-dimensional classification system. For example, one frequently cited principle of developmental psychopathology involves the importance of considering both dimensional and categorical conceptualizations of the phenomena of interest (Kazdin & Kagan, 1994; Rutter & Sroufe, 2000), given that there is little evidence to support the idea that diagnostic

categories are discrete syndromes with distinct etiologies (Beauchaine, 2003). In the following sections, I selectively describe issues raised by Maser et al. in terms of three areas requiring a paradigm shift, and extend these issues to ODD, CD, and relevant developmental psychopathology principles.

Paradigm Shift Concerning the Diagnostic Threshold

Maser et al. (2009) note that many individuals seeking treatment do not meet full diagnostic criteria and thus are assigned to an NOS category. This issue is of critical importance for ODD and CD, given that these symptoms are associated with elevated levels of impairment, even at sub-diagnostic levels (Angold, Costello, Farmer, Burns, & Erkanli, 1999). Unfortunately, the construct of impairment is not well-operationalized, which complicates conclusions that can be drawn regarding symptom levels and their associated effects on functioning. A dimensional approach to symptom severity and/or impairment could facilitate identification of children who are at risk for more severe or pernicious courses prior to the full presentation of symptoms. Indeed, early intervention is preferable for these disruptive behavior disorders given that ODD and CD involve impairment in multiple domains and become more difficult to treat over time (Drabick et al., 2006; Drabick, Gadow, & Loney, 2007; Ezpeleta, Keeler, Erkanli, Costello, & Angold, 2001).

Maser et al. (2009) identify a second issue related to the use of diagnostic thresholds that applies to ODD and CD as well. Specifically, one assumption underlying the *DSM* framework is that clinical phenomena are not continuously distributed, but evidence does not necessarily support this assumption (Beauchaine, 2003; Kazdin & Kagan, 1994; Rutter & Sroufe, 2000). When considered from a developmental psychopathology framework, ODD behaviors are normative at some developmental points; with increasing frequency and/or severity, the behaviors may be viewed as clinically significant. Thus, a dimensional framework appears more appropriate for these types of behaviors. In terms of CD, some behaviors are more normative in adolescence (e.g., serious rule violations), again suggesting that a dimensional framework would be more relevant. Other CD behaviors may be qualitatively different, such as forcing someone into sexual activity or setting fires. Thus, as Maser et al. suggest, recognition that some behaviors are continuous and others are discontinuous is critical for a diagnostic conceptualization of ODD and CD.

Returning to a developmental psychopathology framework, knowledge of normative declines and increases in these symptoms could help to frame decisions as to when a behavior is clinically significant vs. more normative (Rutter & Sroufe, 2000). Wakefield's (1997) harmful dysfunction analysis suggests that a psychological disorder is a condition that is harmful to the individual and caused by a failure of an internal mechanism to perform a function for which it was naturally selected. Wakefield also suggests that we can consider psychopathology as a "developmental deviation" (i.e., a deviation from the behaviors exhibited by others at the same developmental point). Although defining what is "deviant" can be complicated, research indicates that status violations (e.g., staying out late, running away, truancy) and non-aggressive CD symptoms increase with age, whereas aggressive behaviors decrease (Maughan et al., 2004), suggesting that a developmental framework can facilitate identification of processes that are normative vs. non-normative. Although Maughan et al. also report that ODD symptoms decrease with age, this may be an artifact of the *DSM* exclusionary criteria related to ODD and CD. That is, when these authors diagnosed ODD in the presence of CD (counter to the *DSM* guidelines), rates of ODD remained consistent from early childhood to middle adolescence. These examples suggest that with attention to developmentally relevant behaviors and processes, a mixed categorical-dimensional framework may better capture the behaviors associated with ODD and CD; however, this is ultimately an empirical question that awaits further research.

Paradigm Shift Concerning Symptoms

Polythetic Classification and Diagnostic Heterogeneity

Maser et al. (2009) note that the polythetic list of symptoms used within many *DSM* categories permits some flexibility in assigning individuals to diagnostic categories; specifically, individuals only are required to meet criteria for some of the symptoms described within a syndrome. This strategy consequently can lead to a great deal of heterogeneity within diagnostic categories, which is certainly the case with CD and ODD. Indeed, identification of meaningful subtypes within the CD category is an important research avenue (Burke et al., 2002; Loeber et al., 2000). Although numerous distinctions have been suggested (e.g., overt vs. covert behaviors), the CD subtypes (specifiers) considered by the nosological system are childhood- and adolescent-onset (APA, 2000). However, the utility of age of onset as a marker for subtypes has been questioned. In addition to relying on only one factor, reporting on age of onset may invoke a retrospective bias and the usefulness of the early vs. late onset distinction is less clear among girls (Loeber et al., 2000; Moffitt, 1993). Nevertheless, childhood-onset CD (before age 10) is often preceded by persistent ODD symptoms in childhood (Loeber et al., 2000), suggesting that ODD and early-onset CD may exhibit significant continuity. ODD is also a very heterogeneous category, which has led some to propose that emotional and behavioral symptoms should be considered separately (Burke et al., 2002, 2005; Stringaris & Goodman, in press). Nevertheless, few studies have evaluated alternative ways of conceptualizing ODD symptoms. The within-class heterogeneity and across-class homogeneity associated with diagnostic syndromes is not unique to ODD and CD (Beauchaine, 2003). To address these issues, dimensions within the categories of ODD and CD that consider particular subgroups of symptoms that have different developmental courses, outcomes, correlates, or other clinically significant features could be useful for decreasing within-class heterogeneity, and thus inform research and clinical efforts aimed at ODD and CD.

Comorbidity

Comorbidity is more the rule than the exception among child emotional and behavioral disorders (Angold et al., 1999; Caron & Rutter, 1991). Thus, Maser et al.'s (2009) suggestion that dimensions could address comorbidity is critical to consider for ODD and CD and within a developmental psychopathology framework. ODD and CD, considered independently or jointly, co-occur with many additional psychological conditions, such as attention-deficit/hyperactivity disorder, mood disorders, anxiety disorders, and substance use disorders (Angold et al., 1999; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Maughan et al., 2004; Rowe et al., 2002). In addition, prospective research indicates that ODD predicts numerous psychological conditions, including CD, even after controlling for other co-occurring conditions (Burke et al., 2005; Costello et al., 2003; Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002; Maughan et al., 2004; Rowe et al., 2002), suggesting that ODD confers non-specific risk for additional psychological conditions. Maser et al. provide one suggestion for dealing with comorbidity in a dimensional framework, namely, include co-occurring conditions as dimensions. Although this could address the problem of comorbidity surrounding ODD and CD, consideration of the prospective relations among psychological conditions would also be useful. For example, various authors have presented explanations for the development of co-occurring conditions (e.g., Angold et al., 1999; Caron & Rutter, 1991). A developmental psychopathology framework suggests that we consider the course and transactional relations among symptoms and processes over time (Jensen & Hoagwood, 1997; Rutter & Sroufe, 2000). For example, determining whether ODD or CD are risk factors for, or develop secondarily to, other conditions could suggest different etiological models and intervention efforts (Angold et al., 1999; Burke et al., 2005;

Clarkin & Kendall, 1992; Drabick et al., 2006; Rowe et al., 2002). Considering the developmental sequencing and timing of comorbid conditions thus could inform the types of dimensions that are evaluated (Clarkin & Kendall, 1992). In addition, shared processes that may account for comorbid conditions could be included as dimensions. In the following section, I present several candidate processes that may facilitate identification of meaningful subgroups within categories and/or serve as shared processes for comorbid conditions.

Associated Features

There is a burgeoning literature involving potential correlates of various psychological disorders. Maser et al. (2009) note that these variables are often considered associated features within the *DSM* framework. In this section, I extend this idea to include more child-specific (and in keeping with Maser et al., potentially biological) processes than those that are typically considered within the *DSM* framework. One can draw on work from clinical and developmental psychology, cognitive neuroscience, and biological psychiatry to present evidence for potential dimensions that would be alternatively considered as associated features in the current categorical system. When considered in conjunction with other relevant dimensions, these “associated features” may decrease heterogeneity within categories and provide specific treatment suggestions and prognostic information. In addition, considering multiple dimensions would be more in line with a developmental psychopathology perspective, which suggests that it is important to attend to both risk and resilience processes, and to consider how these factors are carried forward and influence later development (Kazdin & Kagan, 1994; Rutter & Sroufe, 2000). Examination of multiple processes and pathways also maps onto the developmental psychopathology concepts of equifinality and multifinality (Cicchetti & Rogosch, 1996). Specifically, equifinality suggests that a variety of pathways can lead to the same outcome (e.g., multiple pathways can lead to CD), whereas multifinality suggests that the same pathway or process can lead to multiple outcomes depending on other aspects of the system, such as contextual factors (Cicchetti & Rogosch, 1996). Although Maser et al. (2009) note that theory is not necessary for deriving diagnostic syndromes, two theories, discussed next, can frame this discussion.

Moffitt (1993) suggested that individuals with life-course-persistent antisocial behavior may be more likely to exhibit deficits in neuropsychological functioning (e.g., verbal and executive functioning deficits), which may interact with problematic environments to confer risk for continued antisocial behavior. Patterson, DeBaryshe, and Ramsey (1989) hypothesized that children who start their antisocial behaviors early may be more likely to experience ineffective, coercive parenting. With school entry, children who are exposed to coercive parenting are likely to engender additional difficulties, including peer rejection and academic problems (Patterson, 1993). Both theories/models invoke the concept of heterotypic continuity; that is, the presence of a presumed trait that underlies quantitative (frequency or severity) and qualitative (addition of peer rejection, academic problems) changes in antisocial behaviors (Moffitt, 1993; Patterson, 1993; Rutter & Sroufe, 2000). The framework of heterotypic continuity fits nicely with developmental conceptualizations of ODD and CD. That is, ODD and CD are likely developmentally staged, and family factors frequently are associated with the progression from ODD to CD (Burke et al., 2002; Lahey & Loeber, 1994).

Deficits in executive functioning (EF; e.g., attention, concentration, planning, and inhibition of prepotent responses) also are associated with disruptive behavior disorders and represent an important component of models involving early-onset and life-course-persistent antisocial behavior (Moffitt, 1993; Raine, 2002). Nevertheless, although children with ODD and CD are likely to evidence difficulties with planning and decision-making in multiple circumstances, EF deficits are only moderately associated with behavior problems, even in the case of attention-deficit/hyperactivity disorder (ADHD) for which EF deficits are

supposed to be a hallmark feature (Halperin & Schulz, 2006). One explanation for these disparate findings involves making a distinction between “cool” cognition, which includes EF abilities, and “hot” cognition, which considers the affective or emotional aspects of decision-making (Kerr & Zelazo, 2004). Prior research has examined cool cognition in the context of ODD and CD (e.g., Clark, Prior, & Kinsella, 2000), as well as hot cognition with CD and psychopathic traits (Blair, Colledge, & Mitchell, 2001; Ernst et al., 2003).

Another line of evidence that supports examination of both cool (EF) and hot (affective decision-making) cognition with ODD and CD symptoms involves amygdala and orbitofrontal cortex (OFC) dysfunction, which is associated with antisocial and aggressive behaviors (Blair, 2004, 2007). The amygdala is involved in the recognition of others’ facial expressions, especially negatively valenced emotions (e.g., fear, disgust) and has been implicated in aversive conditioning and instrumental learning (Blair, 2004, 2007). Thus, if a child engages in an aggressive act, the resulting sadness or fear in the victim and/or punishment for the behavior, both of which would involve the amygdala, could decrease the probability of future aggressive acts. Nevertheless, individuals with primarily instrumental aggression do not necessarily exhibit poor performance on tests of frontal lobe functioning, including EF (Blair, 2004). Age-appropriate frontal lobe functioning may facilitate instrumental aggression, as planning, understanding emotional processes, and regulating emotions could facilitate engaging in instrumental aggression without being detected by authority figures and recruiting others to conspire with them in aggressive acts (Deater-Deckard, 2001).

Frick and Morris (2004) similarly note that the relation between child temperament and behavior problems likely involves two pathways: one involving regulation of negative emotions, and the second involving lack of fearful inhibitions. Children with difficulty regulating negative emotions may be more likely to develop social information processing biases and engage in reactive aggression, whereas children with a lack of fearful inhibitions may evidence deficits in conscience development, as well as elevated levels of instrumental aggression and callous-unemotional traits. Taken together with the limbic and prefrontal processes described above, these temperamental features may provide the framework for multiple dimensions for ODD and CD, and suggest meaningful, more homogeneous subtypes when considered concurrently.

Transactional Relations between Child and Context

Although these child-specific processes may represent useful dimensions for ODD and CD, this presentation fails to highlight one of the more critical principles of a developmental psychopathology perspective, namely, the transactional and reciprocal influences between the child and his or her context (Rutter & Sroufe, 2000). Indeed, one concern often levied at the *DSM* system is that disorders are considered without regard to contextual influences and that the locus of the disorder is conceptualized as within the individual (Beauchaine, 2003; Jensen & Hoagwood, 1997; Kazdin & Kagan, 1994; Rutter & Sroufe, 2000). Moreover, it is possible that the child’s symptoms are a reaction to an adverse environment or problems in only one setting (e.g., home), issues that lend themselves to a very different characterization of the child’s symptoms than if these symptoms were pervasive (Beauchaine, 2003; Jensen & Hoagwood, 1997; Jensen et al., 1997). Although Axis IV permits consideration of such contextual factors, this axis rarely is used in research (Jensen & Hoagwood, 1997). Consistent with Maser et al. (2009), I would suggest that consideration of contextual processes is critical for understanding how certain biological or individual-specific variables may lead to multiple outcomes (multifinality; Cicchetti & Rogosch, 1996). Adopting this modified view of the role of context, developmentally relevant contextual factors could be considered as dimensions as opposed to, or in addition to, Axis IV domains.

To illustrate, this principle of transactional relations can be applied to the child-specific processes described above. Parental behaviors (e.g., modeling, direct instruction, and provision of behavioral contingencies) are critical in the development of children's abilities to regulate negative emotions and demonstrate effortful control, negotiate interpersonal interactions, and comply with others' requests (Blair, 2004; Frick & Morris, 2004; Lengua, Honorado, & Bush, 2007). EF or affective decision-making deficits may contribute to children's difficulties attending to parental demands and parental efforts to teach children how to behave appropriately (Moffitt, 1993; Patterson et al., 1989). However, the child's expectations for parental responses to their behaviors could compensate for EF or affective decision-making deficits that may underlie ODD and CD behaviors. Specifically, given that the amygdala is involved in aversive learning (Blair, 2004, 2007), parental punishment of aggressive or oppositional behaviors could decrease the probability of the child's engaging in these behaviors in the future. However, if the child has an underactive amygdala and is not concerned about punishment for ODD or CD behaviors, the child may be more likely to engage in these behaviors, particularly if the behaviors are reinforced (e.g., the child obtains a desired goal or object). Although there are myriad ways that these processes can interact, it is clear that dimensions for child-specific processes will be moderated by contextual factors, and a mixed categorical-dimensional system should seek to consider clinically relevant aspects of contextual factors.

Paradigm Shift Concerning Distress/Psychosocial Impairment

Maser et al. (2009) suggest that we do not have a clear, agreed upon definition of distress or impairment. ODD and CD provide interesting issues for this limitation. Poor inter-rater agreement for ODD and CD has been well-documented (e.g., Drabick et al., 2007; Kazdin & Kagan, 1994; Kraemer et al., 2003; Loeber et al., 2000). For example, parents and teachers report higher levels of ODD than youth (Loeber et al., 2000), and teacher-reported ODD is more strongly related to impairment criteria than parent- or child-reported ODD (Hart, Lahey, Loeber, & Hanson, 1994). In addition, teacher reports of externalizing symptoms may provide a more differentiated understanding of comorbidity and risk factors related to these symptom groups than parent reports (Drabick et al., 2006, 2007). In general, informants likely differ because of the child's characteristics, context in which ratings occur, and aspects of rater perspectives (De Los Reyes & Kazdin, 2005; Kraemer et al., 2003), but there are other considerations for ODD and CD that may contribute to informant disagreement.

First, ODD presents a rather unusual situation for adult informants in that the informants are potentially not only observers, but also targets of the child's ODD behaviors. Although DSM requires that ODD behaviors must be present more often than among children in the same developmental period, this dual role, combined with the salience of ODD behaviors, may lead to over-reporting of ODD symptoms. In addition, children who engage in ODD behaviors according to multiple informants (e.g., parents, teachers) may have more associated difficulties than children who engage in ODD behaviors according to only one informant (Drabick et al., 2007). Dimensions could be used to capture behavior in multiple settings and the informants who identify problematic ODD behaviors. Second, the criteria for ODD and CD do not necessarily take into account opportunities for engaging in particular behaviors, which makes it more difficult to determine when a behavior should be considered problematic. For example, many CD behaviors have low base rates and occur in the context of deviant peers, whereas ODD is more likely to be evidenced and potentially identified by adult informants given that children have numerous adult interactions. These differential opportunities for engaging in particular behaviors are critical to consider when determining the clinical significance of ODD and CD behaviors. In addition, considering biological and contextual processes could help to differentiate subtypes of children with

ODD or CD who evidence particular characteristics (e.g., temperament, callous-unemotional traits) that could lend themselves to more pervasive displays of these behaviors, as opposed to children who engage in these behaviors as a reaction to adverse environmental conditions (Jensen & Hoagwood, 1997; Rutter & Sroufe, 2000).

A third issue involves how we operationalize distress among youth with ODD or CD. Some authors suggest that if “harm” to the individual stems from social conflict or disapproval and/or if the distress is experienced by others only, then the condition should not necessarily be considered impairing (e.g., Wakefield, 1997). Thus, determining level of impairment can be complicated among youth with ODD or CD, who may not experience overt distress about their behaviors. Last, given the issues described above in terms of informant agreement, careful consideration of whom to ask about ODD and CD behaviors is critical. Taken together, dimensions incorporating level of distress to others as well as self are critical, in addition to factoring in associations stemming from using the same informant for symptoms and distress ratings. Again, dimensions related to contextual processes could address these concerns by providing an opportunity to rate family or other contextual variables that may be relevant.

Concluding Thoughts

Maser et al. (2009) identify important criticisms of the current categorical system, and provide a thoughtful way of incorporating dimensions to address these criticisms. Adopting a developmental psychopathology framework could facilitate application of these suggestions and provide additional theoretical and conceptual foundations for implementing these types of changes. Indeed, rather than creating dissension or facilitating unrelated lines of inquiry, such an approach could allow integration of a variety of literatures and thus contribute more fully to understanding psychological disorders such as ODD and CD.

Although various risk factors for ODD and CD have been identified, few are specific to ODD and/or CD (Steinberg & Avenevoli, 2000), which limits their usefulness for models involving ODD and/or CD. If the goal of the nosological system is to “carve nature at its joints,” we need to evaluate whether a disorder has construct validity, which is best determined by considering multiple levels of analysis (Beauchaine, 2003). Various dimensions that use multiple levels of analysis and are developmentally relevant (e.g., subtypes of behaviors, EF, callous-unemotional traits, severity within different contexts, family processes) may be useful for considering ODD and CD within a mixed categorical-dimensional classification system. However, this is only one approach to addressing the diagnostic issues associated with ODD and CD. Consideration of these processes within a developmental framework, and standardization of related tests on a sample that has not experienced significant psychological symptoms (Maser et al., 2009), would be necessary for incorporating these dimensions into the categorical system. As Maser et al. also note, a large number of dimensions likely will be relevant for each syndrome and culling will be important, particularly if the dimension does not contribute to differential diagnosis or does not evidence sufficient variability within a syndrome.

The present focus was on ODD and CD, given the developmental relations and nosological difficulties associated with these conditions, and the frequent focus on externalizing behaviors in the developmental psychopathology literature. Nevertheless, many of the points apply to multiple syndromes. Research will be necessary to identify meaningful dimensions and the applicability of these dimensions to multiple conditions. The joint consideration of Maser et al.’s issues and a developmental psychopathology perspective can foster new lines of inquiry and synthesize current research to bridge multiple paradigms and potentially provide a more optimal conceptualization of childhood disorders. Though a potentially

onerous undertaking, identification of relevant processes and dimensions could lead to recognition of meaningful subgroups with distinct risk processes, family factors, developmental course, and intervention recommendations.

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References

- American Psychiatric Association. Diagnostic and statistical manual of mental disorders, Fourth edition-Text revision (DSM-IV-TR). Washington, DC: Author; 2000.
- Angold A, Costello EJ, Erkanli A. Comorbidity. *Journal of Child Psychology and Psychiatry*. 1999; 40:57–87. [PubMed: 10102726]
- Angold A, Costello EJ, Farmer E, Burns B, Erkanli A. Impaired but undiagnosed. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1999; 38:129–137. [PubMed: 9951211]
- Beauchaine TP. Taxometrics and developmental psychopathology. *Development and Psychopathology*. 2003; 15:501–527. [PubMed: 14582930]
- Blair RJR. The roles of the orbital frontal cortex in the modulation of antisocial behavior. *Brain and Cognition*. 2004; 55:198–208. [PubMed: 15134853]
- Blair RJR. Dysfunctions of medial and lateral orbitofrontal cortex in psychopathy. *Annals of the New York Academy of Sciences*. 2007; 1121:1–19. [PubMed: 17846153]
- Blair RJR, Colledge E, Mitchell DGV. Somatic markers and response reversal: Is there orbitofrontal cortex dysfunction in boys with psychopathic tendencies? *Journal of Abnormal Child Psychology*. 2001; 29:499–511. [PubMed: 11761284]
- Burke JD, Loeber R, Birmaher B. Oppositional defiant disorder and conduct disorder: A review of the past 10 years, part II. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2002; 41:1275–1293. [PubMed: 12410070]
- Burke JD, Loeber R, Lahey BB, Rathouz PJ. Developmental transitions among affective and behavioral disorders in adolescent boys. *Journal of Child Psychology and Psychiatry*. 2005; 46:1200–1210. [PubMed: 16238667]
- Caron C, Rutter M. Comorbidity in child psychopathology: Concepts, issues, and research strategies. *Journal of Child Psychology and Psychiatry*. 1991; 32:1063–1080. [PubMed: 1787137]
- Cicchetti D, Rogosch FA. Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology*. 1996; 8:597–600.
- Clark C, Prior M, Kinsella GJ. Do executive function deficits differentiate between adolescents with ADHD and oppositional defiant/conduct disorder? A neuropsychological study using the six elements test and Hayling sentence completion test. *Journal of Abnormal Child Psychology*. 2000; 38:403–413. [PubMed: 11100915]
- Clarkin JF, Kendall PC. Comorbidity and treatment planning: Summary and future directions. *Journal of Consulting and Clinical Psychology*. 1992; 60:904–908. [PubMed: 1460151]
- Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A. Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*. 2003; 60:837–844. [PubMed: 12912767]
- De Los Reyes A, Kazdin AE. Informant discrepancies in the assessment of childhood psychopathology: A critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*. 2005; 131:483–509. [PubMed: 16060799]
- Deater-Deckard K. Annotation: Recent research examining the role of peer relationships in the development of psychopathology. *Journal of Child Psychology and Psychiatry*. 2001; 42:565–579. [PubMed: 11464962]
- Drabick DA, Gadow KD, Loney J. Source-specific oppositional defiant disorder: Comorbidity and risk factors in referred elementary schoolboys. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2007; 46:92–101. [PubMed: 17195734]

- Drabick DA, Gadow KD, Sprafkin J. Co-occurrence of conduct disorder and depression in a clinic-based sample of boys with ADHD. *Journal of Child Psychology and Psychiatry*. 2006; 47:766–774. [PubMed: 16898990]
- Ernst M, Grant SJ, London E, Contoreggi CS, Kimes AS, Spurgeon L. Decision making in adolescents with behavior disorders and adults with substance use. *American Journal of Psychiatry*. 2003; 160:33–40. [PubMed: 12505799]
- Ezpeleta L, Keeler G, Erkanli A, Costello EJ, Angold A. Epidemiology of psychiatric disability in childhood and adolescence. *Journal of Child Psychology and Psychiatry*. 2001; 42:901–914. [PubMed: 11693585]
- Frick PJ, Morris AS. Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology*. 2004; 33:54–68. [PubMed: 15028541]
- Halperin JM, Schulz KP. Revisiting the role of the prefrontal cortex in the pathophysiology of attention deficit/hyperactivity disorder. *Psychological Bulletin*. 2006; 132:560–581. [PubMed: 16822167]
- Hart EL, Lahey BB, Loeber R, Hanson KS. Criterion validity of informants in the disruptive behavior disorders in children: A preliminary study. *Journal of Consulting and Clinical Psychology*. 1994; 62:410–414. [PubMed: 8201081]
- Jensen PS, Hoagwood K. The book of names: *DSM-IV* in context. *Development and Psychopathology*. 1997; 9:231–249. [PubMed: 9201443]
- Jensen P, Mrazek D, Knapp P, Steinberg L, Pfeffer C, Schowalter J, Shapiro T. Evolution and revolution in child psychiatry: ADHD as a disorder of adaptation. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1997; 36:1672–1679. [PubMed: 9401328]
- Kazdin A, Kagan J. Models of dysfunction in developmental psychopathology. *Clinical Psychology: Science and Practice*. 1994; 1:35–52.
- Kerr A, Zelazo PD. Development of “hot” executive function: The children’s gambling task. *Brain and Cognition*. 2004; 55:148–157. [PubMed: 15134849]
- Kraemer HC, Measelle JR, Ablow JC, Essex MJ, Boyce WT, Kupfer DJ. A new approach to integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. *American Journal of Psychiatry*. 2003; 160:1566–1577. [PubMed: 12944328]
- Lahey, BB.; Loeber, R. Framework for a developmental model of oppositional defiant and conduct disorder. In: Routh, DK., editor. *Disruptive behavior disorders in childhood*. New York: Plenum; 1994. p. 139–180.
- Lahey BB, Loeber R, Burke J, Rathouz PJ, McBurnett K. Waxing and waning in concert: Dynamic comorbidity of conduct disorder with other disruptive and emotional problems over 7 years among clinic-referred boys. *Journal of Abnormal Psychology*. 2002; 111:556–567. [PubMed: 12428769]
- Lahey BB, Loeber R, Quay HC, Frick PJ, Grimm J. Oppositional defiant and conduct disorders: Issues to be resolved for *DSM-IV*. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1992; 31:539–546. [PubMed: 1592789]
- Lahey BB, Waldman ID, McBurnett K. Annotation: The development of antisocial behavior: An integrative causal model. *Journal of Child Psychology and Psychiatry*. 1999; 40:669–682. [PubMed: 10433402]
- Lengua LJ, Honorado E, Bush NR. Contextual risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology*. 2007; 28:40–55.
- Loeber R, Burke JD, Lahey BB, Winters A, Zera M. Oppositional defiant disorder and conduct disorder: A review of the past 10 years, Part I. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:1468–1484. [PubMed: 11128323]
- Maser J, Norman S, Zisook S, Everall I, Stein M, Schettler P, Judd L. Psychiatric nosology is ready for a paradigm shift in *DSM-V*. *Clinical Psychology: Science and Practice*. 2009
- Maughan B, Rowe R, Messer J, Goodman R, Meltzer H. Conduct disorder and oppositional defiant disorder in a national sample: Developmental epidemiology. *Journal of Child Psychology and Psychiatry*. 2004; 45:609–621. [PubMed: 15055379]

- Moffitt TE. Life-course persistent and adolescence-limited antisocial behavior: A developmental taxonomy. *Psychological Review*. 1993; 100:674–701. [PubMed: 8255953]
- Patterson GR. Orderly change in a stable world: The antisocial trait as a chimera. *Journal of Consulting and Clinical Psychology*. 1993; 61:911–919. [PubMed: 8113492]
- Patterson GR, DeBaryshe BD, Ramsey E. A developmental perspective on antisocial behavior. *American Psychologist*. 1989; 44:329–335. [PubMed: 2653143]
- Raine A. Annotation: The role of prefrontal deficits, low autonomic arousal, and early health factors in the development of antisocial and aggressive behavior in children. *Journal of Child Psychology and Psychiatry*. 2002; 43:417–434. [PubMed: 12030589]
- Rowe R, Maughan B, Pickles A, Costello EJ, Angold A. The relationship between DSM-IV oppositional defiant disorder and conduct disorder: Findings from the Great Smoky Mountains Study. *Journal of Child Psychology and Psychiatry*. 2002; 43:365–373. [PubMed: 11944878]
- Rutter M, Sroufe L. Developmental psychopathology: Concepts and challenges. *Development and Psychopathology*. 2000; 12:265–296. [PubMed: 11014739]
- Steinberg L, Avenevoli S. The role of context in the development of psychopathology: A conceptual framework and some speculative propositions. *Child Development*. 2000; 71:66–74. [PubMed: 10836559]
- Stringaris A, Goodman R. Three dimensions of oppositionality in youth. *Journal of Child Psychology and Psychiatry*. (in press).
- Wakefield JC. When is development disordered? Developmental psychopathology and the harmful dysfunction analysis of mental disorder. *Development and Psychopathology*. 1997; 9:269–290. [PubMed: 9201445]