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## Viewing Preschool Disruptive Behavior Disorders and ADHD Through A Developmental Lens: What We Know & What We Need to Know

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### Keywords

disruptive behavior; ADHD; preschool; psychopathology; nosology

There is now little doubt that DSM-IV behavior disorders are present and identifiable during the preschool years (1,2). With only minor modifications to DSM-IV Disruptive Behavior Disorders (DBDs) and attention-deficit/hyperactivity disorder (ADHD) nosology, multiple, independent studies have shown similar prevalence rates and correlates as in older children (1). In the preschool age range, these disorders also have modest stability (3-6). It is clear that the behaviors that comprise DBDs and ADHD (e.g., noncompliance, rule-breaking, aggression, destruction of property, hyperactivity, inattention, and impulsivity) impair children's functioning and that caregivers of young children often experience considerable difficulty in managing those who exhibit high levels of these behaviors. Increasingly, preschoolers are being referred to mental health clinics for DBDS and ADHD (7), with

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escalating rates of pharmacological treatments (8). Thus, the “real world” consequences of behavior disorders are substantial for young children and their families and often mark the onset of long-term developmental maladaptation that marks psychopathology (9). Concerted effort to characterize the clinical manifestations of these disorders in early childhood more precisely will maximize our ability to intervene effectively in the lives of young children affected with DBDs and ADHD and, ultimately to reduce their long-term health burden.

The increasing consensus that these syndromes exist in young children also comes with growing concern that these disorders may be developmentally misspecified, particularly for young children who are not at the extremes (10). In this paper, we review the extant empirical evidence through a “developmental lens,” with an eye to analyzing how the absence of a developmental approach may hinder accurate identification. Further, we show how integrating evidence from developmental science provides useful guideposts for generating and testing a developmentally-specified nosology. Together with the plethora of work on preschool psychopathology over the past decade, this provides a strong foundation for charting a course for the next generation of more refined efforts in early childhood.

## DBDs and ADHD: What We Know

Although multiple, overlapping terms have been used for capturing behavioral syndromes, for the sake of clarity here, we will use the terms DBDs and ADHD when specifically referring to these clinical syndromes and the term “behavior disorders” to refer to the two syndromes collectively. The study of behavior disorders, has taken on two, somewhat distinct lines. There is a long history of studies of “preschool behavior problems” that generally have used checklist ratings of externalizing behaviors, which combine disruptive attention/hyperactivity behaviors (9). Collectively, studies that have emphasized the dimensional classifications of disorders have informed the field tremendously by enhancing our understanding of the developmental nature of behavior problems in young children, the co-occurrence of various problems (e.g., impulsivity, noncompliance, aggression), the longitudinal course of these problems, and potential underlying mechanisms of these problems (9, 11). More recently, DSM-IV nosology has been applied to preschoolers (2). Although the categorical approach of the DSM is not without limitations, we focus our review on *DSM-defined DBDs and ADHD* as a means of highlighting issues related to categorical identification, clinical significance and service provision. Studies were included in this review if the following criteria were met 1) DSM DBDs (Oppositional Defiant Disorder and/or Conduct Disorder) and/ or ADHD were assessed, 2) the majority of the sample was preschool age (3-5 years), and 3) data were reported on the prevalence, convergent validity or correlates, and/or predictive validity of these disorders. We extend beyond existing reviews (1,12) by incorporating more recent work with developmentally-validated instruments, attempting to bridge preschool studies of DBDs and ADHD that come from somewhat different traditions and heretofore have proceeded along fairly separate lines, highlighting developmental limitations of existing work and linking to extant developmental science.

## DBDs

### Prevalence.

In the absence of validated diagnostic instruments for use in this age period, a variety of instruments have been used for diagnosis in preschoolers. Early studies often used non-standardized, relatively minor modifications of existing diagnostic instruments to determine diagnosis (13,14) or determined diagnosis through clinical consensus using multiple and varied assessment information (15). Most recently, interviews specifically validated for the preschool period have been employed, including the Preschool Age Psychiatric Assessment (PAPA; 3) in addition to other diagnostic tools (Kiddie Disruptive Behavior Disorders Schedule [K-DBDS]), which have been evaluated using clinical samples (16). Across community samples, prevalence rates of ODD have ranged from 4% to 16.6%, which is similar to that found in older children (17). Importantly, although Lavigne and colleagues found the highest rates of ODD (i.e. 16.6%), this rate was reduced in half when impairment associated with the symptoms was required for the diagnosis (i.e., 8.1%). Thus, the presence of symptoms of DBDs alone is misleading and interpreting the presence of symptoms as disorder likely results in higher prevalence of DBDs when impairment resulting from these symptoms is not taken into account. Assessment of impairment, however, is notably absent from most preschool DBD studies. To our knowledge, only two studies have assessed CD as a separate disorder in community samples of preschoolers (3,18) with rates somewhat lower than ODD (3.9%-6.6%), again, without considering impairment.

Age differences within the preschool period have received little attention. Although some studies (3) have reported no age differences in prevalence rates, Lavigne et al (15) found a modest linear age trend in the prevalence of ODD during the preschool period. The prevalence of ODD as defined by presence of 4 symptoms was 22.5% in 3-year-old children but was only 15% in five-year-old children.

### Validity

Determining validity of a psychiatric diagnosis is multifaceted. Here, we focus on two important aspects: concurrent validity and predictive validity. Concurrent (also termed convergent) validity represents the extent to which a test or measure correlates highly with other variables with which it should theoretically correlate, while predictive validity is the extent to which a measured construct demonstrates a predictive relation to the same or a similarly measured construct over time (i.e., longitudinal stability of diagnostic status;1) Predictive validity of a disorder, however, is a particularly challenging issue in young children, as substantial behavioral shifts occur from 3-5 and thus normative frequencies may shift making determination of stability complex. Thus, if manifestation or frequencies of symptoms varies with age, predictive validity (stability) of a disorder may be obscured. On the other hand, the rapid developmental shifts of this period may reduce stability.

Studies have demonstrated that key aspects of the family environment, parent psychopathology, parenting behavior, parent-child interactions, observed child behavior, child neuropsychological functioning, and social information processing differ among children with DBDs compared to typically developing children (18-32). These correlates

are similar to those found in older youth with disruptive disorders. Not surprisingly, children who meet symptom criteria for DBDs also experience substantial impairment in these domains (3,16 )

Several investigators have also assessed predictive validity. Wakschlag and colleagues (6) found that 55% of their clinically-enriched sample retained DBD status at one-year follow-up. Speltz et al (20) assessed the two year stability of ODD and found that that the vast majority of children in their clinic-based sample (76%) continued to meet criteria for ODD diagnosis two years later. In two papers, Lavigne and colleagues (29,32) report on the 2-year and 5-year follow-up results within their preschool community-based sample. They reported the 2-year stability of any behavior disorder (ODD, CD, and/or ADHD) or a combination of the three) was moderate. Stability was higher for older (65% for 4-5 year-olds) than younger (50% for 2-3 year-olds) preschoolers. It is not clear whether this is a true difference in stability, more “noise” in terms of transient variability in behavior at the younger preschool age or due to the absence of developmentally-specified cutpoints at these different ages. Diagnostic stability of ODD dropped substantially with longer follow-up-- with stability of 43%, 27%, and 24% at 3, 4 and 5 year follow-ups respectively. Thus, the probability of a diagnosis of ODD during the school-age period was substantial if ODD was present during the preschool years. On the other hand, these data also demonstrate that the majority of preschoolers (nearly half of preschoolers with an ODD diagnosis at baseline) do not persist in meeting clinical criteria at school age. Similar patterns were reported by Kim-Cohen and colleagues (18) on the 2-year stability of CD in a community sample of children followed from 4½-5 to 7 years of age. Meeting criteria for CD at age 5 significantly increased the odds of a CD diagnosis at age 7 (odds ratio= 20.6), with more boys retaining the CD diagnose than girls. On the other hand, half of these children did not exhibit *any* CD symptoms at age 7 with 60% of these children failing to exhibit any CD symptoms and the subsequent age 10 follow-up (33). Despite this relatively poor diagnostic stability, Kim-Cohen and colleagues report significant impairment in behavioral and academic functioning in these children (18, 33). Collectively, although the short-term reliability of DBDs appears robust, the longer-term (2-5 year) stability of DBDs is questionable. As we will discuss in greater detail in the second half of this paper, it is likely that the downward extension of DSM symptoms largely derived for school-age children to preschool children misspecifies the symptom presentation of DBDs in preschool children. Greater attention to this issue may assist in better defining DBDs in young children that will result in more accurate identification and greater stability over time

This lack of clear stability is a particularly critical issue for those invested in preventing poor long-term outcomes in children. As prevention and early intervention efforts are increasingly recognized as key to altering the often poor trajectories of youth with mental health disorders (35), identifying children who will have persistent disorder is essential. Providing often costly services to children whose difficulties are developmentally transient and who are not experiencing current distress or suffering does not maximize the utilization of valuable resources. Likewise, not identifying children who are likely to develop persistent problems and ultimately poor outcomes is equally, if not more, problematic. Reviews of the literature (36) suggest that substantial misclassification results when the criterion of early onset symptoms of behavioral disorder assessed through parent and/or teacher

self-report is applied to predict long-term development of disorder. Moreover, including pervasiveness or persistence does not result in improved identification of high-risk children (37). Although incorporating data from other key areas of risk that are associated with problematic longer-term outcomes (e.g., parental psychopathology) may prove useful in identifying the highest-risk children, one potential avenue to pursue is improving upon the developmental appropriateness of the symptoms used to capture behavioral disorders in young children.

Lastly, diagnostic differentiation between ODD and CD in young children has rarely been investigated. Keenan and colleagues (16) observed that virtually all preschoolers who met criteria for CD also met criteria for ODD. The one study that has examined the “fit” of this DSM diagnostic differentiation in preschoolers did not provide support for the ODD/CD distinction but rather for a unidimensional DBD construct (38). Taken together with the low stability of preschool age CD symptoms (18) and the attenuation of parent reported CD symptoms over a one week period (3), these data suggest that though multiple independent studies support the presence of DBDs at preschool age, considerably more work is needed to determine the validity of CD as a distinct diagnostic entity in young children.

## ADHD

### Prevalence.

Estimating prevalence rates of DSM-defined ADHD in preschoolers is often challenging as an ADHD diagnosis requires symptoms to be present in more than one setting but many young children are not in school. Thus, assessing for ADHD depends on the extent to which preschoolers spend a considerable portion of their day outside of parental care. Prevalence rates from community and pediatric clinic samples of preschoolers for ADHD range from 2-18.2% (3, 12-15; 39-41), with a range from 2-9.5% in pediatric samples, which are in-line with prevalence rates for older youth (17). Clearly, differences in prevalence rates of preschool ADHD between studies are a function of the type of assessment conducted, with clinical consensus and structured interviews resulting in lower prevalence rates. The use of DSM-referenced symptom checklists resulted in higher prevalence rates, which is not surprising given that these checklists typically do not assess additional DSM criteria necessary for a diagnosis (e.g., presence of impairment; pervasiveness across settings). These additional criteria for an ADHD diagnosis may pose a significant issue in early childhood. For instance, the issue of pervasiveness across settings as a criterion is a good example of the extent to which “downward” extensions of existing criteria may obscure meaningful patterns in young children because they do not reflect the “context” of early childhood. While this issue has received scant attention in the preschool period, more recent instruments do incorporate developmentally appropriate consideration of context. For example, the PAPA has adapted criteria for pervasiveness across settings by requiring that ADHD symptoms to occur in at least two activities and be, at least sometimes, uncontrollable by the child or by adult admonition.

Prevalence data is relatively sparse regarding specific ADHD subtypes in young children (3, 12, 39-41). First, the Hyperactive/Impulsive Type is most commonly observed in preschool children, followed by ADHD Combined Type. Studies suggest that ADHD Inattentive

type is relatively rare in the preschool age range; however, again this raises issues of developmental sensitivity of symptoms as the majority of inattentive symptoms in the current nosology focus on school-based tasks. When significant inattentive symptoms are endorsed, these symptoms usually co-occur with hyperactive-impulsive symptoms. To our knowledge, only one study has assessed age effects on ADHD diagnosis, with results demonstrating that the combined type ADHD was more commonly diagnosed in older preschool children (12).

### **Validity.**

Numerous studies have assessed the convergent validity of DSM-Defined ADHD in preschoolers (13; 42-49). Similar to what is observed in older youth with ADHD, preschoolers with ADHD have poorer social skills, more difficulties with their peers, have greater academic difficulties, and poorer cognitive and neuropsychological functioning. Moreover, their parents often have greater levels of psychopathology and stress, negative parenting behavior, feel less competent in their role as parent, and have poorer coping styles

To date, Lahey and colleagues have conducted the most extensive studies of stability of DSM ADHD and ADHD subtypes (6; 49). Lahey et al (49) found that 75-85% of 4-6 year old preschool children meeting ADHD criteria initially retained this diagnosis during the following three subsequent years. Over the course of an 8-year follow-up, the proportion of youth who retained and ADHD diagnosis decreased in a pattern similar to that observed in older children (50). Additionally, children who initially met criteria for either the Inattentive or Hyperactive/Impulsive subtype alone were more likely not to meet ADHD diagnosis at follow-up assessment compared to children who initially met criteria for ADHD combined type. For those children who continued to meet ADHD diagnosis, there was considerable instability in DSM ADHD subtypes. Collectively, these findings call into question the reliability and utility of the DSM nominal categories of ADHD in young children. As Lahey and colleagues note, “the subtypes cannot be viewed as discrete (nominal) categories that are permanent over time” (pg. 901). Perhaps, as the authors state, continuous measures of ADHD symptoms, particularly the hyperactive/impulsive symptoms which appear to vary considerably over time, would be an appropriate diagnostic qualifier to classifying ADHD subtypes. It is clear that although the broad ADHD diagnosis has utility as a diagnostic entity in young children, further study must be conducted on the longer-term outcomes of preschool children with ADHD in order to best determine the utility of DSM ADHD subtypes. Alternatively, as we discuss below, an approach which includes a more developmentally specified definition of ADHD symptoms may better capture the presentation of ADHD in young children. Ultimately, greater precision in our conceptualization of ADHD symptoms for younger children is needed to clarify issues of subtypes and stability.

### **DBDs and ADHD: Applying a developmental analysis**

Does the extant literature suggest that the road ends here for our understanding of DBDs and ADHD in early childhood? We have suggested that it does not (10, 51, 52). The early approach of “adhering as closely as possible to DSM-IV” with only



minor developmental modifications (2) was a critical first step in broadly establishing syndromal coherence that extends down to early childhood. This process has demonstrated that young children can experience clinically relevant and pervasive behavior problems which warrant attention and further investigation. With this accomplished, however, narrowly constraining conceptualization of behavior disorder phenomenology to the existing nosology may contribute to misspecification in early childhood. We have suggested that accurate identification during this developmental period requires a developmentally-specified approach in order to establish the critical features of behavior disorders that distinguish symptoms from the normative misbehavior of early childhood (6,10). This developmentally-specified approach would include elements such as identifying unique criterial features of behavior disorders in young children, establishing duration and symptom criteria cut-points to generate maximally sensitive and specific thresholds, and defining symptom parameters in a manner that sharpens the typical : atypical distinction. Below we apply a developmental lens to elucidate this approach.

### Developmentally Imprecise, Impossible, Improbable, and Inappropriate

Many DBD and ADHD symptoms overlap substantially with the normative misbehaviors of early childhood (e.g. often interrupts, loses temper, defies adults; 51). For instance, Egger, Kondo, and Angold (12) found that many preschoolers met school-age cutoff criteria for the symptoms of “often loses temper” (30%), “often interrupts or intrudes” (47%) and “often actively defies” (57%), respectively. Moreover, Pavuluri et al (53) found that parents rated 48% and 65% of preschoolers as “often easily distracted” and “often talking excessively”, respectively. Although this is particularly true for ODD and ADHD, even some CD symptoms that are generally defined as more serious, low-incidence behaviors, may be prevalent in young children. For example, Keenan et al (16) found that a significant number of non-referred preschool children without behavioral concerns met DSM-IV symptom criteria for “uses object to harm” (14%) and “often lies” (20%). Further, these symptoms are defined solely by frequency (“i.e. often”) during a period in which presence of these behaviors *per se* is not pathognomonic (51). In addition to developmental specification of frequency cut-points, *quality* of behavior (e.g., its intensity, responsivity to environmental modification) may be important for such typical : atypical distinctions during the preschool period (10, 51). Symptoms that overlap with commonly occurring misbehaviors of young children without specification of how frequently they must occur in order for these behaviors to be of clinical concern and/or criterial clinically defining features beyond frequency are *developmentally imprecise*. Developmental imprecision is likely to contribute to *over-identification* because normative misbehaviors (such as temper tantrums and defiance) may be mistakenly considered symptoms.

In contrast, many DSM symptoms (CD in particular) are *developmentally impossible* for young children (e.g., truancy) (10). Others are *developmentally improbable*: while preschoolers may be capable of these behaviors (i.e., stealing with confrontation) they represent extreme forms of behavior that are unlikely to occur and are not likely to be the critical defining features at this young age (10). Thus, reformulating these symptoms to capture the underlying construct being assessed in a manner that better reflects the preschool age period is necessary. In addition, some symptoms, particularly those for ADHD, are



*developmentally inappropriate* (e.g., often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities; does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace; often loses things necessary for tasks or activities). Developmental inappropriateness occurs when constructs that are more easily assessed in school-age children versus preschool children are included in the psychiatric nosology. For instance, for DSM ADHD symptoms of inattention, the inattentive symptoms focuses on distraction, which is too diffuse and may be more challenging to measure precisely in young children. Thus, this “developmental inappropriateness” may lead to under-identification of inattentive subtypes during early childhood.

Although no studies to date have examined patterns of sensitivity and specificity of the existing DSM-IV nosology for preschoolers (e.g. false positives, false negatives, subsequent onsets, remitters), it is likely that developmentally impossible, improbable and inappropriate symptoms contribute to *under-identification of certain children as well as entirely missing children who may have a disorder*. This is because (a) dropping “impossible” symptoms leads to a restricted item pool; (b) “improbable” symptoms are likely only to capture only a small number of preschoolers with extreme manifestations and (c) “inappropriate” symptoms are not likely to effectively capture these behaviors in the manner they are present in most young children. For instance, conclusions that the ADHD-Inattentive Type does not occur (or is not a meaningful subtype) in preschoolers may be premature in the absence of developmentally-appropriate operationalization of symptoms.

Given the rapid growth young children experience during early childhood in language, cognitive skills, executive functioning, moral reasoning, and self-regulation (54), elucidating the parameters, presentation, meaning, and occurrence of the behaviors that define disruptive and attentional syndromes during this developmental period is particularly complex. Fortunately, major strides in developmental science over the past few decades have provided substantial evidence of the sequenced unfolding of these capacities in early childhood (55-59). Although a comprehensive review is beyond the scope of this paper (10, 52), the following sections briefly describe the developmental underpinnings of core processes that underly the defining behaviors of DBDs and ADHD. These “clues” from developmental science provide a critical foundation towards the goal of a developmentally-specified nosology for preschool behavior disorders.

## Aggression

As posited by Tremblay and colleagues (60), aggression during early childhood peaks during the toddler period but is “unlearned”, resulting in a normative decline of aggression over time, as self-control, language and adaptive problem-solving skills are acquired with maturation. Thus, persistently high levels of aggression across early childhood are not normative. This suggests that mere frequency of aggression during early childhood is likely not informative—moving beyond subjective frequency (i.e. “often”) to determine normative frequency patterns within this developmental period is critical for demarcating the clinical threshold as well as for determining whether this differs at various ages across early childhood.

## Temper Loss

Quality of tantrums has also been identified as clinically discriminating both in distinguishing disruptive from normative behavior and in distinguishing DBDs from other disorders (61). These qualities including intensity of anger expressions, destructive tantrums and difficulty recovering, have been linked to clinical problems in young children (10; 61; 62). Frequency, although important, is not in and of itself a key indicator of disorder in young children. Likely a combination of both developmentally inappropriate frequency of tantrums (determined across the preschool age range) in addition to the quality of the tantrum can best help determine whether a tantrum of particular preschool child is concerning.

## Noncompliance

As in the case of tantrums, developmental studies have focused on *quality* of noncompliance as a key distinction between typical and atypical manifestations (64-66). Normative noncompliance is characterized by affectively regulated, goal-directed, adaptive behaviors which are responsive to adult redirection. In contrast, problematic noncompliance has been defined as active resistance to control and refusal that is often associated with negative affect (68, 69). This includes “doing the opposite” of what was asked, an automatic, reflexive “no” and noncompliance in the context of angry outbursts (52).

The clinical implications of these developmental patterns for both tantrums and noncompliance is that taking quality of misbehavior into account is likely to be critical to developing empirically based parameters for distinguishing disruptive behavior symptoms in a developmentally-sensitive manner in early childhood. Identifying the interactional context of normative misbehaviors may also be clinically discriminating (51).

## Attention

Disruptive behaviors are discrete and relatively easily defined (e.g., loses control of temper, hits another child). Although there are issues in how the construct of disruptive behavior varies with development, there is little question as how to define the problem behaviors in question. In contrast, the two main constructs of ADHD, inattention and impulsivity/hyperactivity, both involve “control” and are mixed to include cognitive and behavioral aspects. For example, attention is typically considered a cognitive ability, and yet in ADHD it is defined behaviorally by distractibility, poor persistence across time, etc. Impulsivity includes both acting without thinking, reward-driven disinhibition, whereas hyperactivity typically is considered to reflect increased motor activity level, although it is rarely measured objectively in clinical settings. Not surprisingly, these measurement issues have precluded adequate specification of the key control processes across early development.

Attention is a basic cognitive construct, which is surprisingly difficult to define. Although aspects of focused, obligatory attention are evident in infancy (70), there are marked developmental changes in the control of attention during the preschool years (71, 72). Ruff, Cappozzoli, and Weissberg (73) conducted a series of seminal studies on the development of sustained visual attention in preschool children. Importantly, the set of studies attempted

to determine developmental trends in attention in several different situations (i.e., free play, television viewing, and reaction time task), to assess attention, consistency within and stability across situations. Attention typically is considered a biologically-based cognitive skill that is “endogenous” and thus should be highly consistent across contexts. In fact, however, attention is no different than compliance and temper behaviors in its dependence on context. Attention across different contexts is not as stable within individuals as attention measured in the same context across time. Clinically, these results highlight that individual differences in attention during the preschool period observed by assessment in one setting may be problematic for capturing clinically relevant attention problems.

Furthermore, it is not clear how actively sustaining attention differs from executive control. Indeed, a single latent factor has recently been found to underlie performance on inhibitory and working memory tasks (74) in typically developing preschool children, although preschoolers diagnosed with ADHD show deficits across task conditions when it is manipulated experimentally to load on motor inhibition (Go-No-Go Task) or sustained attention (Continuous Performance Task; 75). Most studies to date in preschoolers with ADHD have shown deficits in control processes, some more in attention, some more in motor, and some in control in light of reward (76). Collectively, it's clear that in the preschool age range, children with ADHD have difficulty controlling behavior or cognition in light of expectation or instructions, although whether this difficulty is related to “attention” “executive-function” or ‘motivation’ is not clear.

### **Impulsivity and Activity Level**

Impulsivity most often is defined at the behavioral level as the ability to delay, inhibit, or control behavior in light of reward or direction. At the behavioral level, developmentally, these behaviors have been lumped under the rubric of self-regulation or effortful control. Kochanska and colleague's (77-80) studies of effortful control (i.e., low levels of impulsivity; although Kochanska's conceptualization of effortful control also includes effortful attention and control of motor activity) demonstrated significant developmental progress in effortful control across the preschool period such that by 45 months, effortful control was highly stable and appeared to be a trait-like characteristic of young children. Thus, effortful control (i.e., impulsivity), unlike attention in young children, appears to be less affected by setting or context.

Activity level has been less studied but also shows similar developmental patterns. In one of the few studies on the development of hyperactivity, Romano and colleagues (81) in a large national survey of parents of young children found that there were four trajectories depicting hyperactivity in children from the age of 2 to 6/7. Data indicated that a small proportion of the children (4.5%; n= 132) exhibited very few initial hyperactive symptoms that decreased to zero over time. A significant number of children (42.0%; n= 1237) also exhibited few initial hyperactive symptoms which remained at a low level over time. An equally substantial number of children (46.3%; n = 1365) exhibited moderate initial levels of hyperactivity that declined slightly over time. Finally, a small number of children (7.2% n= 212) exhibited high initial levels of hyperactivity at age 2 and this level increased slightly over time. The data clearly demonstrates that hyperactivity, even in young children, is not

uniformly high. In fact, 90% of young children have low to moderate levels of hyperactivity which decrease over time. Clearly more data is necessary on understanding the presentation of hyperactivity in young children beyond the assessment of frequency.

## Charting a Developmentally Refined Nosology for DBDs and ADHD

As we have discussed at several points throughout this paper, there is an opportunity to better capture the phenomena of DBDs and ADHD as manifested in the early childhood period, particularly by applying a more “bottom up” developmentally-driven approach to the specification of symptoms, with an emphasis on quality of the behavior (intensity, expectability in context, flexibility and organization of behavior). For instance, although “is often angry and resentful” is a symptom of ODD, a more developmentally sensitive specification of the underlying construct of anger in young children may include, “Gets angry or mad for “no reason,” “Loses control when angry,” and/or “Has trouble calming down when angry” (10). These multiple definitions of temper-loss are derived from incorporating the developmental literature on the *quality* of anger in young children as pathognomic rather than just frequency of anger outbursts. Thus, these developmentally-driven definitions of temper -loss may more precisely capture the specific facets of temper loss that are clinically discriminating in young children. Likewise current ADHD symptoms of inattention (e.g., often has difficulty sustaining attention in tasks or play activities), hyperactivity (e.g., often talks excessively) and impulsivity (often interrupts or intrudes on others) could alternatively be captured by symptoms of dyscontrol such as “difficulty with controlling attention to the relevant rule in one-to-one play activities”, “cannot control talking in situations when remaining quiet is expected (e.g., story book reading) over short periods of time”, and “cannot desist in interrupting others when provided structure and support to participate in engaging activities”, respectively. These alternative symptoms define clinical patterns in reference to developmentally expectable tasks and capabilities in early childhood. Although these examples represent potential developmentally-sensitive specifications of DBD and ADHD symptoms for young children, to date these are theoretically-derived and will require systematic linkage to distributional characteristics of these behaviors within this developmental period and empirical validation of the incremental utility of a developmentally-specified approach.

### Do developmentally-specified refined symptoms of DBDs and ADHD add value and how would we know?

Revision of existing DBD and ADHD criteria specifically for young children requires strong justification. As Moffitt and colleagues contend (82), altering an established nosology may alter “patient’s access to health-care and educational services, confuse the use of diagnosis on the courts and undermine the cumulative nature of scientific research into mental disorders (p. 24)”. Thus, there must be substantial evidence that a change in symptom specification leads to incremental benefits compared to the standard specification documented in the DSM. We propose that developmental specification will provide substantial incremental value but of course, this requires empirical validation (10). First, developmental-specification of symptoms is likely to substantially enhance accurate identification thus increasing sensitivity, specificity, and stability of symptoms. As Bennett

and colleagues contend (36;37), our ability to provide intervention to those in greatest need depends greatly on accurate identification of children who are on the beginnings of a chronic disruptive behavior trajectory. Currently, relatively poor prediction from preschool disruptive behavior does not provide adequate targeted prevention efforts.

## Treatment

Over the past two decades there has been an increasing evidence-base for both psychosocial and pharmacological interventions for DBDs and ADHD in preschoolers (83-85). Although a comprehensive review of this literature is beyond the scope of this paper (see papers in this issue), we highlight here some key findings of the primary psychosocial intervention for which there is substantial evidence of validity in preschoolers, specifically, Behavioral Parent Training (BPT; 83; 86; 87).

BPT has been evaluated as a treatment for ODD, CD, and ADHD in children as young as two years old, demonstrating significant reductions in observed and parent-reported behavioral problems (88-93), and inattentive and hyperactive behavior (88; 94). Moreover, beyond statistical significance, studies demonstrate that some preschool children attain clinically significant (i.e., normalization of behavior) benefits from BPT (95; 96). BPT has also been shown to reduce punitive parenting behavior (90; 93; 96), parenting stress (88; 97), increase positive parenting behavior (95), and parenting sense of competence (90; 95). Furthermore, maintenance of treatment gains for some preschool children has been seen for periods ranging from a few months (88;90) to a year (98) or more (91; 93; 99). Some studies have demonstrated continued improvement for these children after termination of treatment (91). Also, studies have shown that BPT for preschool children with ODD/CD has broader impact for targeted children and their families. For example, studies have demonstrated effects of BPT on the school behavior of targeted preschool children (89) as well as improving the behavior of non-targeted siblings (95; 100). Collectively, the evidence suggests that BPT should be a first-line treatment for preschool-aged children who are at-risk for or are diagnosed with ODD, CD, or ADHD.

The clear evidence for BPT for DBDs and ADHD must also be kept in light of the fact that a substantial minority of children do not respond to BPT (101; 102). Although multiple reasons have been posited, we note that the lack of developmental specification of DBD and ADHD symptoms potentially undermines the efficacy of BPT and other interventions (e.g., stimulant medication). For example, we noted earlier that noncompliance per se is not pathognomic but can be adaptive and developmentally appropriate for preschoolers. However, developmentally, certain expressions of noncompliance, in particular the reflexive “no” and noncompliance in the context of angry outbursts, are problematic. Thus, if we only target BPT to those children who, developmentally, have *maladaptive noncompliance*, we are likely maximizing the effectiveness of BPT. Likewise, implementing BPT for children with developmentally appropriate expressions of noncompliance is a misuse of costly services. Similarly, when multiple expressions of developmentally maladaptive behavior exist, such as noncompliance as reflexive “no” versus noncompliance in the context of anger, developing targeted interventions based on the varying expression of the behavior can lead to better tailored treatment. For instance, a reflexive “no” may be

considered more temperamentally/biologically-driven, and thus perhaps more responsive to pharmacological intervention while noncompliance in the context of anger may suggest the utility of implementing psychosocial interventions that focus on assisting parents to support emotional regulation in their child. Although space prohibits further elaboration of the treatment implications of developmental specification of DBD and ADHD symptoms, we believe that this approach has great potential to obtaining a greater understanding of how best to treat young children with DBDs and ADHD.

## Summary

Although DSM-defined DBDs and ADHD manifest during early childhood in meaningful ways, the emphasis of extending the DBD and ADHD nosology, which is based on studies of older youth, to younger children potentially limits the utility of these symptoms. Given that it is clear that DBDs and ADHD often emerge during early childhood and that early intervention is most efficacious, developing a more refined understanding of the clinical phenomenology of behavior disorders in early childhood is a critical next step. We contend that an approach which emphasizes developmental specification of symptoms has the potential to address several long-standing issues in the literature, including enhancing specificity, sensitivity and stability of DBD and ADHD symptoms. Moreover, progress toward developmentally specified symptoms may inform our understanding of which type of treatment works best for whom. Answers to these questions are critical if we are to ultimately intervene to improve the lives of young children affected with DBDs and ADHD.

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**Synopsis:**

Empirical investigation into disruptive behavior disorders (DBDs) and ADHD in early childhood has expanded considerably over the past decade. Although there have been considerable gains in the understanding of the presentation and course of these psychiatric disorders in early childhood, a lack of a developmental framework to guide nosological issues likely impedes progress in this area. We propose that enhanced developmental sensitivity in defining symptoms of DBDs and ADHD may shed light on outstanding issues in the field. In particular, developmental specification may enhance specificity, sensitivity and stability of DBDs and ADHD symptoms as well as inform our understanding of which type of treatment works best for whom. The current paper provides an overview of these critical issues.