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Developmental level and psychopathology: Comparing children with developmental delays to chronological and mental age matched controls

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ABSTRACT

Children with developmental delays (DD) are at heightened risk for developing clinically significant behavioral and emotional difficulties as compared to children with typical development (TD). However, nearly all studies comparing psychopathology in youth with DD employ TD control groups of the same chronological age (CA). It is unclear, then, whether the heightened symptomology found in age-matched children with DD is beyond what would be expected given their developmental level. The present study assessed rates of behavior problems and mental disorder in 35 children with DD at age 9 years. These were compared with rates from 35 children with TD matched for CA at age 9 and also earlier rates for these same children at age 6, when matched for mental age (MA). Children with DD had significantly more behavior problems in 7 of the 17 scales of the CBCL when compared to TD children matched for CA, and 6 of 17 scales when compared to the MA-matched group. Rates of meeting DSM-IV criteria for a psychiatric disorder were significantly higher in the DD group than both the CA- and MA-matched TD groups for three and four, respectively, of the seven diagnoses examined. Descriptively, the mean ratings for all variables assessed were higher for the DD group than both TD comparison groups, with the exception of the Anxious/Depressed scale of the CBCL. These findings validate the heightened risk for clinically significant behavior problems and mental disorders in youth with DD above and beyond their developmental functioning.

1. Introduction

Children with developmental delays (DD) are at substantially higher risk for developing clinically significant behavioral and emotional difficulties than children with typical cognitive development. This comorbidity of DD and a mental disorder is often referred to as *dual diagnosis*. Epidemiological studies indicate that 30–50% of youth with DD meet the clinical cutoff for behavioral and emotional problems and/or diagnosable mental disorder (see Einfeld, Ellis, & Emerson, 2011 for review). Studies that include comparison samples of children with typical development (TD) highlight the considerable difference in

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risk for psychopathology, with the relative risk for youth with DD (to youth with TD) ranging from 2.8–4.1 to 1 (Baker, Neece, Fenning, Crnic, & Blacher, 2010; Dekker, Koot, van der Ende, & Verhulst, 2002; Emerson & Hatton, 2007).

For the purposes of the current study, the term developmental delay refers specifically to children with cognitive delay, one of the six areas of developmental delay recognized by the *Individuals with Disabilities Act* (IDEA, 2004). It is estimated that 13.4% of children in the United States meet criteria for cognitive developmental delay (Rosenberg, Zhang & Robinson, 2008). This developmental (cognitive) delay is associated with diverse impairments in multiple domains, including social competence (Guralnick, 1999), adaptive behavior (e.g., Green, Caplan, & Baker, 2013) and the focus of the current study, clinically significant behavioral and emotional problems (i.e. dual diagnosis; Baker et al., 2010).

Dual diagnosis is a concern for families, service providers, and researchers alike, as the presence of mental disorder in individuals with DD contributes substantially to the burden of disability. Dual diagnosis has been found to have deleterious effects on families, including increased parenting stress (Neece, Green, Baker, 2012), increased burden on the family (Irazábal et al., 2012) and decreased parental well-being (Tonge & Einfeld, 2003) beyond the presence of DD alone. Additionally, psychopathology in youth with DD often limits participation in the community, as severity of psychopathology relates to unsuccessful adaption to independent living (Fotheringham, 1999), reduced occupational opportunities (Anderson, Lakin, Hill, & Chen, 1992) and restrictions in recreational and educational programs (Parmenter, Einfeld, Tonge, & Dempster, 1998).

The substantially increased risk for psychopathology in youth with DD, coupled with the implications of dual diagnosis for the affected individual and family, highlight the need for early assessment and treatment of behavior problems and mental disorders. However, there has been some debate regarding the validity of diagnosable mental disorders in youth with DD. The Diagnostic and Statistical Manual for Mental Disorders (DSM) has consistently referenced developmental level in defining many childhood mental disorders (e.g. APA, 2000), making it difficult for clinicians and researchers to determine whether the presence of symptomatology in youth with DD is attributable to their developmental level, or to a distinct, comorbid condition. This practice continues in the recently released DSM-5 (APA, 2013), which states that to meet criteria for certain childhood mental disorders, an individual must present with symptoms: "inconsistent with developmental level" (Attention Deficit Hyperactivity Disorder; ADHD), "outside the range that is normative for the individuals developmental level" (Oppositional Defiant Disorder; ODD) or that are "developmentally inappropriate" (Separation Anxiety).

Despite these developmental criteria, nearly all studies comparing rates of psychopathology in youth with or without DD implement comparison groups of TD children matched for chronological age (CA; e.g., Baker et al., 2010; Emerson & Hatton, 2007), thereby comparing groups that by definition operate at different developmental levels. A more nuanced approach rooted in developmental theory is to match targeted groups on an indicator of developmental functioning, such as mental age (MA; Flanagan, Russo, Flores, & Burack, 2008). By comparing the behaviors and symptoms of children with DD to MA-matched controls, one can determine whether children with DD are truly at heightened risk for developing psychopathology beyond what would be expected given each child's cognitive level.

The goal of comparison group matching is to rule out "non-central," or extraneous, explanations of group differences (Jarrold & Brock, 2004). Using control groups matched by MA is a longstanding method for controlling for developmental level in comparing the functioning of children with and without developmental disabilities. This methodology largely stems from the *developmental* (e.g., Zigler, 1969) and *difference* (e.g., Ellis & Cavalier, 1982) approaches to intellectual disability, through which researchers sought to illuminate the similarities or fundamental differences, respectively, in developmental processes exhibited by children with or without intellectual disability when controlling for developmental level. More recently, the approach has been used to demonstrate differences in many behavioral and cognitive processes, such as adaptive behavior (Fidler, Hepburn, & Rogers, 2006), social communication (Strid, Heimann, Gillberg, Smith, & Tjus, 2013) and joint attention (Wong & Kasari, 2012) between individuals with or without developmental disabilities.

The few studies that have implemented MA-matching to study behavior problems or psychopathology in children with or without DD have primarily focused on children with specific disorders, such as Down syndrome. Evans and Gray (2000) examined compulsive behaviors in children with Down syndrome and MA-matched TD controls, finding that children with Down syndrome were rated to have the same number of different compulsive behaviors, but higher frequency and more intensity of these behaviors. Evans, Canavera, Kleinpeter, Maccubbin, and Taga (2005) assessed differences in the fears, phobias, and anxieties of children with autism spectrum disorder (ASD), Down syndrome (matched for MA), or MA- and CA-matched children with TD. Children with ASD were reported to have more situational and medical fears than any of the other groups, regardless of CA or MA matching. More recently, van Gameren-Oosterom et al. (2011) examined eight year-old children with Down syndrome and MA-matched controls, finding that children with Down syndrome exhibited more emotional and behavioral problems. Additionally, Evans, Kleinpeter, Slane and Boomer (2014) found that repetitive behavior predicted poor adaptive functioning for children with Down syndrome, but not MA-matched controls. Together these findings substantiate the increased risk for psychopathology in children with DD beyond developmental level. However, there is a need to replicate such findings across heterogeneous samples of children with DD, rather than only those with specific disorders such as Down syndrome or autism.

The present study expanded on prior work by comparing a broad range of behavior problems in children with DD to these same problems in CA- and MA-matched TD comparisons. Additionally, we sought to determine whether children with DD met DSM-IV criteria for the most prevalent childhood mental disorders, including ADHD, ODD, anxiety disorders and mood disorders (Merikangas et al., 2010), at a higher rate than CA- and MA-matched TD controls.