



## Identifying comorbid depression and disruptive behavior disorders: Comparison of two approaches used in adolescent studies

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### ABSTRACT

Interest in commonly co-occurring depression and disruptive behavior disorders in children has yielded a small body of research that estimates the prevalence of this comorbid condition and compares children with the comorbid condition and children with depression or disruptive behavior disorders alone with respect to antecedents and outcomes. Prior studies have used one of two different approaches to measure comorbid disorders: 1) meeting criteria for two DSM or ICD diagnoses or 2) scoring .5 *SD* above the mean or higher on two dimensional scales. This study compares two snapshots of comorbidity taken simultaneously in the same sample with each of the measurement approaches. The Developmental Pathways Project administered structured diagnostic interviews as well as dimensional scales to a community-based sample of 521 11–12 year olds to assess depression and disruptive behavior disorders. Clinical caseness indicators of children identified as “comorbid” by each method were examined concurrently and 3-years later. Cross-classification of adolescents via the two approaches revealed low agreement. When other indicators of caseness, including functional impairment, need for services, and clinical elevations on other symptom scales were examined, adolescents identified as comorbid via dimensional scales only were similar to those who were identified as comorbid via DSM-IV diagnostic criteria. Findings suggest that when relying solely on DSM diagnostic criteria for comorbid depression and disruptive behavior disorders, many adolescents with significant impairment will be overlooked. Findings also suggest that lower dimensional scale thresholds can be set when comorbid conditions, rather than single forms of psychopathology, are being identified.

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Co-occurring depression and disruptive behavior problems are common in children and adolescents. Both categorical and dimensional measurement approaches have been used to classify comorbid depression and disruptive behavior disorders in child populations (Angold and Costello, 1993; Angold et al., 1999a). One group of well-designed research studies defines comorbidity on the basis of a child meeting diagnostic criteria for depression and a disruptive behavior disorder (Cohen et al., 1993; Costello et al., 2003; Marmorstein and Iacono, 2003; Zoccolillo, 1992). Another group of well-designed studies defines comorbidity on the basis of having elevated depression and disruptive behavior problem

dimensional scale scores (Capaldi, 1991; Ingoldsby et al., 2006; Miller-Johnson et al., 1998; Rockhill et al., 2009). Research based on both traditions has demonstrated epidemiological comorbidity (Kraemer, 1995), insofar as comorbid depression and disruptive behavior disorders occur more frequently than would be expected on the basis of chance alone (Zoccolillo, 1992), as well as clinical comorbidity, in that adolescents with comorbid disorders suffer from greater functional impairment than adolescents with only one disorder (Capaldi, 1991; Ingoldsby et al., 2006; Rockhill et al., 2009). Under consideration in the DSM-5 is a recommendation to use both approaches in making psychiatric diagnoses. Research that contributes to our understanding of the comparability between structured diagnostic interviews and dimensional scales for identifying individuals with comorbid conditions is notably absent. Currently, DSM-5 field trials are underway to evaluate the performance of a new

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system with added features of syndrome-specific dimensional measures and cross-cutting indicators of general mental health status (Kraemer et al., 2010). A better understanding of the degree of complementarity of different approaches for identifying psychopathology is needed to inform revisions to psychiatric nomenclature.

Efforts to establish the validity of screening tools has yielded an extensive literature that evaluates the sensitivity and specificity of questionnaire-based dimensional measures with regard to interviewer-obtained categorical diagnoses (e.g., Jensen et al., 1993, 1999; Kasius et al., 1997; Rhew et al., 2010; Richardson et al., 2010). However, few studies have examined sources of discrepancy between dimensional and categorical approaches or focused on comorbid conditions. Two papers from large cohort studies have compared methods of classifying childhood psychopathology. The Great Smoky Mountains Study showed that children with functional impairment related to life at home and school who did not meet DSM-III-R diagnostic criteria for a disorder demonstrated equivalent indicators of clinical caseness (e.g., receipt of mental health services, child and parent perceptions of child's need for help) as those who met DSM diagnostic criteria. Children who did not meet diagnostic criteria but who had high symptomatic impairment scores had significantly higher likelihood of clinical caseness (i.e., received specialty and school-based mental health services, parent perceived burden due to child's symptoms, parent perception that child had a problem of needed help) than children with no diagnosis and low impairment scores (Angold et al., 1999b). In the Children in Community Study, a simple count of symptoms was equivalent to a psychiatric diagnosis in identifying adolescents who as young adults failed to complete high school or had criminal involvement (Vander Stoep et al., 2002). These findings might suggest that using strict diagnostic criteria alone has low sensitivity for identifying youth experiencing psychiatric problems and sequelae.

To date only one study has conducted a "head to head" comparison of clinical caseness of children assessed by both diagnostic and dimensional approaches of classifying psychopathology. Jensen and Watanabe (1999) compared psychopathology identified via categorical, dimensional, or both approaches on measures of service use, life stress, and parental depression. Among 201 children from military families those meeting DSM diagnostic criteria for a psychiatric disorder and CBCL total score above a *T*-score of 60 differed significantly from those who were negative on both measures, whereas children meeting either the categorical or dimensional criteria only demonstrated intermediate levels on most risk and outcome indicators. This study provided important empirical information regarding comparability of the two classification systems but was limited by the use of a small sample and a broad age range of children.

While prior studies suggest that when it comes to identifying adolescents with non-comorbid conditions, similar results can be derived from different measurement methods, none have compared classification systems with respect to identification of children with comorbid conditions. The current study extends the literature by taking simultaneous "snapshots" of comorbid depression and disruptive behavior disorders in one sample using the two approaches that have been used extensively in prior comorbidity research. The objectives of the study are to compare DSM-IV criteria and dimensional scale score classification approaches 1) in their estimation of the prevalence of comorbid depression and disruptive behavior disorders, 2) in the degree of concordance with regard to the adolescents they identify as comorbid, and 3) in the clinical severity of the adolescents so identified.

## 1. Materials and methods

The current research is based on the Developmental Pathways Project (DPP), a community-based cohort study designed to

examine the antecedents, phenomenology, and outcomes of comorbid depression and disruptive behavior disorders in early adolescence. The investigation was carried out in accordance with the latest version of the Declaration of Helsinki and was approved by the University of Washington Human Subjects Division. Informed assent of the participants and informed consent from a parent or guardian was obtained after the nature of the procedures had been fully explained.

### 1.1. Sampling procedures and sample

Sampling was conducted in two stages (Vander Stoep et al., 2011). Stage 1 involved universal classroom-based screening of 6th grade students for depression and disruptive behavior problems. Stage 1 procedures have been detailed previously (Vander Stoep et al., 2005). Stage 2 was a longitudinal study in which six in-home assessments were conducted with a stratified random sample of children screened in Stage 1 and a parent/guardian. Data analyzed for the current paper were derived from the Stage 1 screening, Stage 2 baseline and three-year follow-up assessments.

For the purpose of selecting a stratified random sample for longitudinal study, all screened students were assigned to one of four groups: high depression and high disruptive behavior score (CM), high depression and low disruptive behavior score (DP), low depression and high disruptive behavior score (DB), and low depression and low disruptive behavior score (NE), using .5 *SD* above the screening sample mean as a cutoff for a high score for the two screening scales. To enhance the likelihood of observing psychopathology and related outcomes over the course of early adolescence, students whose screening scores were high on either or both depression or disruptive behavior dimensions were oversampled for participation. Each year a target number of students who had been randomly selected from the four cells in a ratio of approximately 1 CM: 1 DP: 1 DB: 2 NE were recruited. In the screening sample the distribution is approximately 1 CM: 1 DP: 1 DB: 6 NE. A total of 521 subjects (64.6% of eligibles selected) were recruited into the longitudinal study. Among eligible adolescents selected for recruitment, participants did not differ significantly from non-participants on the basis of gender or screening depression or disruptive behavior scores. Participation rates did, however, differ on the basis of race, with the participant group comprised of a disproportionately lower number of Asian American children. In study analyses two-component weights were applied to each participant to account for the oversampling of youth with elevated psychopathology scores enrolled in the longitudinal study and to render the longitudinal study cohort representative of students enrolled in participating schools.

The Developmental Pathways longitudinal study sample comprised 249 (47.8%) girls and 272 (52.2%) boys. Participants included 148 (28.4%) African Americans, 97 (18.6%) Asian Americans and Pacific Islanders, 21 (4.0%) Native Americans, and 255 (48.9%) European Americans. Across racial groups, 10.2% of children were of Hispanic ethnicity. The mean age at the baseline interview was 12.02 years (*SD* = .43). Families spanned a range of income levels, with 26.7% of families having an annual household income of under \$25,000, and 31.1% with an income over \$75,000.

### 1.2. Measures

Baseline interviews were conducted within three months of screening. Parent/caregiver and child interviews were conducted separately; 75.6% of parent/caregiver interviewees were mothers. Both child and parent received a monetary incentive after completing the interview. Five follow-up interviews were conducted over the course of the subsequent three years.

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