Separating the Domains of Oppositional Behavior: Comparing Latent Models of the Conners' Oppositional Subscale

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Objective: Although oppositional defiant disorder (ODD) is usually considered the mildest of the disruptive behavior disorders, it is a key factor in predicting young adult anxiety and depression and is distinguishable from normal childhood behavior. In an effort to understand possible subsets of oppositional defiant behavior (ODB) that may differentially predict outcome, we used latent class analysis of mother report on the Conners' Parent Rating Scales Revised Short Forms (CPRS-R:S). **Method:** Data were obtained from mother report for Dutch twins (7 years old, n = 7,597; 10 years old, n = 6,548; and 12 years old, n = 5,717) from the Netherlands Twin Registry. Samples partially overlapped at ages 7 and 10 years (19% overlapping) and at ages 10 and 12 years (30% overlapping), but not at ages 7 and 12 years. Oppositional defiant behavior was measured using the six-item Oppositional subscale of the CPRS-R:S. Multilevel LCA with robust standard error estimates was performed using the Latent Gold program to control for twin–twin dependence in the data. Class assignment across ages was determined and an estimate of heritability for each class was calculated. Comparisons with maternal report Child Behavior Checklist (CBCL) scores were examined using linear mixed models at each age, corrected for multiple comparisons. **Results:** The LCA identified an optimal solution of four classes across age groups. Class 1 was associated with no or low symptom endorsement (69–75% of the children); class 2 was characterized by defiance (11–12%); class 3 was characterized by irritability (9–11%); and class 4 was associated with elevated scores on all symptoms (5–8%). Odds ratios for twins being in the same class at each successive age point were higher within classes across ages than between classes. Heritability within the two "intermediate" classes was nearly as high as for the class with all symptoms, except for boys at age 12. Children in the Irritable class were more likely to have mood symptoms on the CBCL scales than children in the Defiant class but demonstrated similar scores on aggression and externalizing scales. Children in the All Symptoms class were higher in both internalizing and externalizing scales and subscales. **Conclusions:** The LCA indicates four distinct latent classes of oppositional defiant behavior, in which the distinguishing feature between the two intermediate classes (classes 2 and 3) is the level of irritability and defiance. Implications for the longitudinal course of these symptoms, association with other disorders, and genetics are discussed. J. Am. Acad. Child Adolesc. Psychiatry; 2013;52(2):172-182. **Key Words:** oppositional defiant disorder, twin, latent class analysis.

Along with conduct disorder (CD) and attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorder (ODD) is one of the leading reasons for referral to youth mental health services.[1] In contrast to CD, which is seen as a severe and inflexible condition,[2] ODD has often been considered a fairly mild condition,[3] possibly because some of the behaviors associated with it approximate normative child development (e.g., losing one's temper, arguing with adults). This thought has persisted, despite evidence that ODD is in fact distinguishable from normal childhood behavior[2,4] and is present in up to 2% of girls and nearly 5% of boys.[5] Despite differences between CD and ODD, research on these disorders has typically combined the two, collapsing them into a single construct.[6–8] In doing so, many studies


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involving ODD and CD fail to consider the two disorders distinctly, and often ODD is excluded altogether. Because ODD and CD are often studied in concert, the specific environmental and genetic contributants to ODD remain elusive. It is often assumed that ODD is caused by poor parenting or by environmental causes; yet, research demonstrates that, separate from CD, there is support for specific genetic factors associated with ODD.[9] Although studies have found that ODD and CD are correlated, the symptoms appear to represent distinct processes.[10] As researchers have begun to separate the disruptive behavior disorders and to examine ODD individually, it has become clear that ODD may not be as benign as previously thought. Instead of serving as prodrome for CD, the ODD diagnosis may in fact play a significant role on its own in the development of a wide range of child psychopathology, including, depression, anxiety, CD, and later the development of antisocial personality disorder.[11]

Subtyping of the ODD diagnosis may be especially important if we hope to understand its association with later development of psychopathology (e.g., more defiant behavior predicting something distinct from ODD with more irritable or reactive features), as well as its association with service use and prescribed treatment adherence. Copeland *et al*.[12] found that ODD emerges as a key disorder in predicting young adult anxiety and depression. Earlier age at onset of ODD symptoms generally results in a poorer prognosis in terms of progression to CD and, ultimately, antisocial personality disorder. In fact, it has been estimated that approximately 30% of children who have an early onset of ODD later progress to develop CD.[1,13] However, it may be important to differentiate between boys and girls, as findings have been mixed. In one study, ODD in girls was found to be associated with increased risk of depression, anxiety, and later ODD but was not associated with increased risk for later development of CD.[14] In examining the course of the disorder, preschool children with ODD are likely to exhibit additional disorders several years later, and with increasing age, comorbidity with ADHD, anxiety, or mood disorders begins to appear.[15] In fact, ODD as a long-term predictor of many other disorders holds in childhood and adolescence even when controlling for other disorders.[12] Furthermore, the distinction among ADHD, ODD, and CD seems to be supported by research, but findings have again been mixed.[4,13,16,17] Similar to CD, the association of ODD and ADHD appears to indicate more severe psychopathology. Compared to children with ADHD only, children with both ODD and ADHD tend to be more aggressive, show a greater range and persistence of problem behaviors, are rejected at higher rates by peers, and underachieve more severely in the academic domain. Children and adolescents with ODD not only appear to have significantly higher rates of comorbid psychiatric disorders, but they also seem to have significantly greater family and social dysfunction relative to other youths with psychopathology.[13,18] Understanding the subtypes of ODD that might predict differential outcomes seems prudent.

A study by Stringaris and Goodman[19] attempted to subtype ODD using three distinct *a priori*–derived dimensions of oppositionality: irritable, hurtful, and headstrong. This study found that all three dimensions were associated with differing manifestations of CD; therefore, the authors concluded that distinct subtypes of oppositionality likely do not exist. Furthermore, they concluded that the three dimensions may suggest differing origins and trajectories to oppositionality, based on the cross-sectional and longitudinal associations that they had seen. This has been followed by studies from Aebi *et al*.,[20] who demonstrated similar dimensions in preschoolers,[21,22] and Rowe *et al*.,[23] who demonstrated that there were few cases of "pure" headstrong behavior. They examined differential prediction of the dimensions and showed that the headstrong dimension was associated with substance disorder and that irritability was associated with later anxiety disorder. Similarly, Kolko and Pardini[24] studied dimensions of treatment resistance and showed that irritability was associated with treatment-resistant ODD, whereas hurtfulness was associated with later treatment-resistant CD. We questioned whether defining subtypes using a bottom-up approach, rather than using *a priori* dimensions might produce a slightly different result. Specifically, we questioned whether latent class analysis (LCA) could be used to refine the ODD phenotype. LCA is a form of person-centered categorical data analysis that allows one to identify latent classes that account for the distribution of cases that have similar categorical response variables.[25] By the nature of the analysis, these classes are mutually exclusive, with each having its own particular pattern of item endorsement. LCA presupposes the existence of discrete latent categories of responding