The Dysregulation Profile in Young Children: Empirically Defined Classes in the Generation R Study

Maartje M.G.J. Basten, M.Sc., Robert R. Althoff, M.D., Ph.D., Henning Tiemeier, M.D., Ph.D., Vincent W.V. Jaddoe, M.D., Ph.D., Albert Hofman, M.D., Ph.D., James J. Hudziak, M.D., Frank C. Verhulst, M.D., Ph.D., Jan van der Ende, M.Sc.

Objective: Children with co-occurring internalizing and externalizing problems have higher levels of impairment and worse outcomes later in life, but it is unclear whether these children can be distinguished validly from children who have problems in a single domain. We used a person-centered statistical approach to examine whether a group of children with co-occurring internalizing and externalizing problems can be identified in a general-population sample of young children. **Method:** This study included a population-based sample of 6,131 children, aged 5 through 7 years. Mothers (92.6%) reported emotional and behavioral problems using the Child Behavior Checklist/1.5–5 (CBCL). A latent profile analysis was performed on the CBCL syndrome scales. Identified classes were compared on early socioeconomic and parental risk factors using multinomial logistic regression. **Results:** We identified 4 classes, as follows: a class scoring high on all internalizing and externalizing scales (1.8%); a class with internalizing problems (5.3%); a class with externalizing problems and emotional reactivity (7.3%); and a class without problems (85.6%). The first class, with co-occurring problems, was associated with higher levels of maternal and paternal affective symptoms and hostility than the other 3 classes. **Conclusions:** The class with co-occurring internalizing and externalizing problems appears to be highly similar to the CBCL Dysregulation Profile described in older children. This empirically based dysregulation profile offers a promise to the study of the development of poor self-regulation. J. Am. Acad. Child Adolesc. Psychiatry, 2013;52(8):841–850. **Key Words:** Child Behavior Checklist (CBCL), dysregulation, latent profile analysis (LPA), preschool, parental psychopathology

nternalizing and externalizing problems co-occur at rates that are much higher than expected by chance. Co-occurrence of internalizing and externalizing problems has been associated with higher levels of impairment and higher risk for adult psychiatric disorders, criminal offenses and suicide.[1-3] Studying co-occurrence may increase our understanding of the etiology, course, and treatment of psychiatric disorders.[1] So far, most research on the co-occurrence of internalizing and externalizing problems has been done in school-aged children

and adolescents. However, because psychiatric symptoms begin in the preschool period, research on co-occurrence should also start at an early age.[4]

One of the methodological challenges to investigating children with co-occurring internalizing and externalizing problems is validly distinguishing them from children who have problems in a single domain. Co-occurring problems are often defined using cut-points on internalizing and externalizing dimensions.[2,5,6] However, the use of cut-points on continuous variables results in loss of information. In addition, it is debatable as to which cut-points should be used. Finally, it is unclear how many groups are needed to adequately describe these co-occurring problems in children. Person-centered methods, such as latent class analysis (LCA) or

latent profile analysis (LPA), help to identify homogeneous groups of individuals with similar patterns of psychopathology.

Person-centered methods have previously been used to examine children with co-occurring internalizing and externalizing problems. To our knowledge, these studies focused only on high-risk samples and not on the general population. Connell et al.[7] performed LCA on the preschool Child Behavior Checklist (CBCL)[8] in a sample of preschool children with behavioral problems, family problems, and/or low socioeconomic status. They identified the following 4 classes: comorbid internalizing and externalizing; externalizing only; internalizing only; and normative. Interestingly, children with comorbid internalizing and externalizing problems appeared to benefit more from a family-centered intervention than children with problems in a single domain.[7] Tolan and Henry[9] found 4 very similar patterns of psychopathology using LCA in urban, poor, school-aged children. The class of children with high scores on internalizing and externalizing scales was most strongly associated with poor psychosocial functioning 2 years later. These studies showed the importance of identifying children with co-occurring internalizing and externalizing problems for examining intervention effects and prognosis. However, the selection of children who are at high risk might have resulted in biased prevalence and patterns of co-occurring problems.[1]

In school-aged children, LCA has also been used to identify the CBCL Dysregulation Profile, a phenotype that is characterized by co-occurring internalizing and externalizing problems.[10] The CBCL Dysregulation Profile latent class captures children with high scores on the items of Anxiety/Depression, Attention Problems, and Aggressive Behavior scales.[11-13] This class was associated with suicidal behavior, and predicted increased rates of anxiety, mood, and disruptive behavior disorders in adulthood.[12,13]

The co-occurrence of internalizing and externalizing problems presented in the CBCL Dysregulation Profile is thought to stem from an underlying syndrome of poor self-regulation.[10] A common factor underlying internalizing and externalizing problems has been studied by others using related concepts such as irritability[14] and mood lability.[15] In preschool children, self-regulation is often studied from a temperamental perspective.[16] At this young age, poor self-regulation has also been shown to be a key feature of emerging and persisting internalizing and externalizing problems.[5,16] The identification of the CBCL Dysregulation Profile in young children would allow continued study of poor self-regulation from preschool to adolescence using an empirically based measure.

In person-centered methods, it is important to study risk factors or other correlates of classes. External validity can be demonstrated if class membership can be predicted from variables other than the ones used to create the classes.[17] Studying risk factors can also aid the understanding of a differential etiology of classes. Many family and environmental factors such as parental psychopathology, poverty, and stressful life events are related to both internalizing and externalizing problems.[18] Co-occurring internalizing and externalizing problems, in comparison with problems on a single domain, have been associated with higher levels of risk factors.[18]

In the present study, we used a person-centered method to examine whether a group of children with co-occurring internalizing and externalizing problems could be distinguished in a general population sample of young children. We performed LPA on the syndrome scales of the preschool CBCL in a large sample of 5- to 7-year-old children. A wide range of continuously measured psychological problems was used to overcome the limitations of previous studies that used LCA based on dichotomized scale scores[7,9] or that investigated only a subset of problems.[11-13] We hypothesized that we would find a highly problematic group of children scoring high on internalizing and externalizing scales. We were interested in whether this group would have elevated scores on all scales or only on the Anxious/Depressed, Attention Problems, and Aggressive Behavior scales contributing to the CBCL Dysregulation Profile. We also hypothesized that we would observe a group of children with mainly internalizing problems and a group of children with mainly externalizing problems. We expected the majority of the children to be in a class characterized by no psychopathology. To examine external validity and differential etiology, the classes were examined in relation to known risk factors for psychopathology, that is, gender, ethnicity, maternal education, family income, and parental psychological problems. We expected the highly problematic class to be most strongly associated with these socioeconomic and parental risk factors.