A Typology of Behavioral Adjustment in Ethnically Diverse Middle School Students

Sangwon Kim,[1] Pamela Orpinas,[2] Roy Martin,[2] Arthur M. Horne,[2] Terri N. Sullivan,[3] and Daniel B. Hall[2]

Abstract

This study examined a typology of adaptive and maladaptive behaviors of 2,552 ethnically diverse early adolescents who attended sixth grade in public schools and lived in disadvantaged communities. Behavioral adjustment of adolescents was measured by teacher ratings using the Behavior Assessment System for Children (BASC). Although typologies of children based on the BASC have been available in the literature for the past decade, little research exists on typologies of adolescents using the same instrument. The present study extended into early adolescence previous classification works focusing on childhood. A series of cluster analyses supported a seven-cluster solution: well-adapted, average, adaptive skills deficits, internalizing problems, mildly disruptive, disruptive behavior problems, and severe problems. Results appear similar to prior investigations with unique features reflecting the high-risk characteristics of the current sample. Implications of this research are discussed with regard to prevention and intervention efforts implemented within the schools.

The classification of phenomena is a fundamental process of science (Blashfield, 1998; Blashfield & Aldenderfer, 1988). Despite its importance, there is considerable debate about the reliability and utility of the extant systems for classifying childhood psychopathology (Blashfield, 1998; Silk, Nath, Siegel, & Kendall, 2000). Psychopathology researchers have outlined two general types of classification systems: the clinical or psychiatric approach and the empirical approach. In general, the clinical or psychiatric approach is based on the judgment of a group of experts and

[1]Fordham University, New York, NY, USA
[2]University of Georgia, Athens, GA, USA
[3]Virginia Commonwealth University, Richmond, VA, USA

Corresponding Author:
Sangwon Kim, Division of Psychological and Educational Services, Fordham University, 113 W. 60th Street, Suite 1008, New York, NY 10023, USA
Email: asakim@fordham.edu

on research findings that demonstrate the reliability, validity, and inclusiveness of the classification scheme. The American Psychiatric Association (2000) uses this clinical approach, which is codified in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (*DSM-IV-TR*). The clinical approach, which is derived from a traditional disease model of psychopathology, results in categories of disorders.

The alternative method, often referred to as the empirical approach, bases classification on continuous measures of behaviors (e.g., anxiety) and on the statistical association among these continuous measures (Achenbach, 1995; Quay, 1964). This model assumes that behaviors are arranged on a continuum based on the frequency and intensity of behavior of a given type (e.g., behaviors indicative of anxiety) and that a classification scheme can be obtained by empirically documenting the associations within these continua. Moreover, the empirical approach exemplified by dimensional variables has greater predictive validity than the *DSM* categorical method (Fergusson & Horwood, 1995).

However, dimensions need to be translated into categories to ease communication and day-to-day decisions for treatments (Achenbach & Edelbrock, 1978; Blashfield, 1998; Kendell, 2002). The dimensional approach also has an inherent problem: As a variable-oriented approach, it does not recognize the dynamic nature of human behavior. As an alternative, the person-oriented approach creates categories of persons based on the specific patterns of dimensionally scaled variables (Bergman & Magnusson, 1997). The family of statistical procedures grouped under the heading of cluster analysis is often used to apply the person-oriented approach to classifying childhood psychopathology (Bergman, 2000). This classification approach is promising, as it may best address the issues of comorbidity and subthreshold symptoms (Cantwell, 1996). At the present time, the cluster analytic approach serves mainly as a research tool, and its direct application to practice appears limited requiring further research.

Researchers have made several attempts to classify childhood psychopathology using clustering procedures (Edelbrock & Achenbach, 1980; Lessing, Williams, & Gil, 1982; McDermott & Weiss, 1995). Among these studies, some produced a comprehensive classification of child behavior using representative national samples. For example, McDermott and Weiss (1995), using the national standardized sample of the Adjustment Scales for Children and Adolescents (McDermott, Marston, & Stott, 1993), identified 22 clusters that ranged from the absence of behavior problems to clinically diagnosable problems. In McDermott and Weiss (1995), 77% of the sample was classified as well or marginally adjusted and approximately 21% at risk or maladjusted. Furthermore, Kamphaus and colleagues have actively conducted research on a typology of child behavioral adjustment using the Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) rating scales (Kamphaus, DiStefano, & Lease, 2003; Kamphaus, Huberty, DiStefano, & Petoskey, 1997; Kamphaus et al., 1999). In the study of teacher-rated behaviors for children aged 6 to 11 years, Kamphaus et al. (1997) found that 34% of the national sample was in the *well-adapted* cluster and 19% was in the *average* cluster. Thus, teachers rated 53% of all students as having no subclinical or clinical problems. In the subclinical range, 12% of students were classified in the *mildly disruptive* cluster, 8% in the *disruptive behavior disorder* cluster, 12% in the *learning disorder* cluster, and 11% in the *physical complaints and worry* cluster. At the most extreme level of problematic behavior, 4% of the national sample was classified in the *severe problems* cluster. This seven-cluster work has been supported by evidence of internal validity (Huberty, DiStefano, & Kamphaus, 1997) and external validity (DiStefano, Kamphaus, Horne, & Winsor, 2003). It has been also replicated across cultural groups (Kamphaus & DiStefano, 2001) and with at-risk elementary school-aged children (DiStefano et al., 2003; Kim, Kamphaus, & Baker, 2006). Despite the relatively extensive works on typologies of children conducted by Kamphaus and colleagues, a typology of adolescents from national samples of the BASC or the BASC-2 teacher rating scales has not been published.

Another study conducted by Tolan and Henry (1996) investigated classes of a large sample of children in elementary schools. However, the study by Tolan and Henry departed from work by Kamphaus et al. (1997) in that it focused on children who were at risk living in inner-city and other urban poor communities and it examined only clinical behavior problems using the Teacher Report Form of the Child Behavior Checklist (Achenbach, 1991). Based on the patterns of behavior problems, Tolan and Henry identified four groups, including (a) no aggression, (b) aggression, thought problems, and other problems, (c) aggression with no internalization, and (d) withdrawal with no aggression. Although this structure was comparable with that of Kamphaus et al., the limited scope of the measure Tolan and Henry used (i.e., focusing on negative behaviors without considering adaptive behaviors) led to no differentiation within normally developing children. As seen in Kamphaus et al., the inclusion of both maladaptive and adaptive behaviors in research will generate a more comprehensive understanding of patterns of child behavioral adjustment.

The purpose of this study is to extend the classification work conducted by Kamphaus et al. (1997) and of Tolan and Henry (1996) into early adolescence using multisite, large samples of mostly urban, low income, and ethnically diverse students. The present study examines teacher rating scales for adolescents from the BASC and assesses the stability of taxonomies based on normative samples from child populations. As stated previously, prior research provided satisfactory replications of Kamphaus and colleagues' work with at-risk samples of children with minor variance reflecting the uniqueness of these samples. For example, in a study of predominantly minority first graders, Kim et al. (2006) found seven clusters, one of which was a previously unidentified cluster: *mildly adapted* (i.e., having mildly elevated adaptive skills in the absence of behavior problems). Based on previous findings, it is reasonable to expect to find stability of the typology with some variations that reflect the high-risk characteristics of the current sample.

Method

Procedures

Data were collected from participants as part of a large violence prevention study for middle school students, the Multisite Violence Prevention Project (MVPP, 2004). The study was conducted across four diverse geographical sites (Durham, NC, 8; Richmond, VA, 8; Chicago, IL, 12; Northeast GA, 9). Across sites, a total of 37 schools were recruited to participate in an experimental study designed to evaluate the impact of violence prevention programs for sixth-grade students. (For additional details on the study and interventions, please see Meyer, Allison, Reese, Gay, & MVPP, 2004; Miller-Johnson, Sullivan, Simon, & MVPP, 2004; Orpinas, Horne, & MVPP, 2004; Smith et al., 2004.) The data for the present study, which were collected in the fall of 2001, correspond to the baseline evaluation of students participating in the MVPP (students were evaluated in sixth, seventh, and eighth grade). Schools were located in communities with a high poverty rate and high juvenile arrests for violent crime (Henry, Farrell, & MVPP, 2004). As such, two-thirds of the students were eligible for free or reduced-price lunch (MVPP, 2004). From each of the 37 schools, a random sample of approximately 80 sixth graders was invited to participate. Active parent consent and student and teacher assent were obtained from all participants, yielding a recruitment rate of 76%.

Participants

The sample for this study consisted of 2,552 students (1,257 males and 1,295 females). The majority of the children identified themselves as non-Hispanic African Americans ($n = 1,199$; 47%) or Hispanic ($n = 503$; 22%), followed by non-Hispanic Americans of European descent ($n = 445$;

17%), and other or mixed ethnic group ($n = 333$; 13%). A few students ($n = 72$; 3%) did not provide information about race and ethnicity. Data regarding students' age were not collected; however, all students were in sixth grade meaning they were at a minimum of 11 years of age. At the time of data collection, the majority of students should have been between 11 and 12 years of age.

Teachers ($n = 279$) rated students' behavioral functioning using the BASC (Reynolds & Kamphaus, 1992). We obtained ratings for each student from a core academic teacher who knew the student well. Because teachers completed the BASC in late November, they had known their students for a minimum of 2.5 months. Each teacher rated an average of 9 students; however, teacher effects were not adjusted for. Demographic information of teachers was not collected.

Instrumentation

The BASC (Reynolds, & Kamphaus, 1992) is a multimethod, multidimensional set of measures designed to assess the behavior problems and adaptive skills of children and adolescents. This research used one of the BASC's components, the Teacher Rating Scales for Adolescents (TRS-A), which was specifically designed for and normed on teacher ratings of students aged 12 to 18 years. The TRS-A consists of 138 items designed to measure 13 constructs aggregated into four higher-order composites: Externalizing Problems (aggression, hyperactivity, conduct problems), Internalizing Problems (anxiety, depression, somatization), School Problems (attention problems, learning problems), and Adaptive Skills (leadership, social skills, study skills). Two of the 13 scales are not included in one of these aggregates (Atypicality, Withdrawal). Teachers rate the adolescent's behavior on a 4-point scale of frequency, ranging from *Never* (1) to *Almost always* (4). Scores were calculated by summing all responses of items in each scale. All scores were transformed to *t*-scores ($M = 50$; $SD = 10$), which were calculated using the standard formula (normative mean and standard deviation for students aged 12 to 18 years). Because the MVPP study was a longitudinal study (i.e., evaluated students in sixth, seventh, and eighth grade) and in consultation with one of the authors of the BASC, the MVPP study used the adolescent version of the BASC for all students, even though some students might have been 11 years of age at the baseline evaluation in sixth grade.

The manual reports psychometric properties of the BASC TRS-A (Reynolds & Kamphaus, 1992). The median internal consistency of the scores of all scales, measured by Cronbach's alpha, was .90 (ranging from .77 to .95). Test–retest reliability scores over a 1-month period ranged from .75 to .89. Based on responses of participants in the present study, the median internal consistency of the scores of all scales was .87 (ranging from .74 to .95). Moreover, the manual provides three types of validity evidence. First, a series of confirmatory factor analysis and principal-axis factor analysis was conducted to examine the factor structure of the TRS-A. Confirmatory factor analysis results indicated that change from three factors to four factors improved the fit (the three-factor model: $\chi^2(62) = 1,858$, adjusted goodness-of-fit index [AGFI] = .579, root mean square residual [RMSR] = .083; the four-factor model: $\chi^2(59) = 1,335$, AGFI = .667, RMSR = .074). Exploratory factor analyses supported the four-factor model as well, which was chosen as a final model. Second, the TRS-A scores correlated with other behavioral measures' scores. For example, the correlations between the TRS and Teacher Report Form scores were very high, indicating a high degree of similarity between the constructs measured by the two measures. Third, the TRS score profiles of groups of children with particular diagnoses provided important empirical support for the interpretation of the measure.

Statistical Analyses

The purpose of cluster analytic procedures is to create homogeneous groups of respondents using multiple dimensional scales. We used a two-step cluster analytic procedure, a Ward method

followed by a *K*-means analysis (Huberty et al., 1997; Milligan & Cooper, 1987). The Ward method creates groups that have minimum variance within a cluster; however, with this method, once students are assigned to a cluster they cannot be reassigned as the clustering procedure continues. To overcome this drawback, a *K*-means analysis was used. In this procedure, the final solution from the Ward method was used to establish the initial centroid, and individuals were reassigned to clusters based on proximity to the centroid of the continually adjusted cluster. The number of clusters retained was determined by both empirical evidence, including the cubic clustering criterion (CCC); and pseudo *F* (Aldenderfer & Blashfield, 1984), and theory. Then, the cluster solution was replicated with three randomly selected half samples from the entire current sample. SAS 9.1 was used to run the cluster analysis.

Results

The current sample was clustered independently, ignoring prior knowledge of the typology from the BASC TRS-C normative sample. Two statistics, the CCC and the pseudo *F*, were plotted by the number of possible clusters to determine the number of clusters underlying the data set. An "elbow plot" for each of the CCC and pseudo *F* showed values on the vertical axis and the number of clusters on the horizontal axis. The bend in the graph indicated the number of clusters to consider. Based on the plots, solutions of between 5 and 11 clusters were run. Interpretations of these solutions were conducted by two of the coauthors and one outside expert with extensive experience in child psychopathology and cluster analysis. Two main components were used to interpret cluster solutions. First, we examined the centroid—the mean values of the variables used in clustering—to determine if a pattern of mean values identify a subgroup of adolescents. Second, we examined supporting information on each cluster's characteristics, such as gender distribution and cluster size. These two pieces of information were compared with theories of child development and child psychopathology.

In addition, we examined whether the cluster solution was replicable using three random half samples of the participants in the current study. For this additional analysis, we chose to run six-, seven-, and eight-cluster solutions; the other solutions were excluded because they were difficult to interpret. Given that cluster analysis is sample dependent (i.e., cluster solutions are subject to sampling variability and may differ somewhat from sample to sample), we considered a cluster solution to be replicable if all clusters in the solution were replicated at least once in any of the three random half samples. The eight-cluster solution was not replicated, whereas the six- and seven-cluster solutions were replicated. Between these two replicated solutions, we finally chose the seven-cluster solution over the six-cluster solution as the former appeared the most interpretable and meaningful based on theories and research findings of child development and child psychopathology. Although the six-cluster solution met empirical criteria including statistics and replicability, it seemed to have a limited representation of types of adolescent behavioral adjustment and yielded a group of adolescents whose characteristics appeared less meaningful and interpretable (i.e., having mild academic problems and mild adaptive skills deficits). Table 1 presents mean *t*-scores by scales for the seven clusters, which we ordered along a continuum of increasing pathology.

Cluster 1 was named Well-Adapted because it consisted of students whose teachers perceived them to have no problematic behaviors and who had strong adaptive skills. The cluster contained 16% of the total sample, and 69.9% of those in the cluster were girls.

Cluster 2 was named Average as the mean score for each scale was close to a *t*-score of 50. This cluster included students whose teachers rated them as having no significant behavioral problems and average adaptive skills. It consisted of 25% of the sample; 60.4% of the students in this cluster were girls.

Table 1. t-Scores for the Seven-Cluster Solution of the Teacher Rating Scales for Adolescents From the BASC (N = 2,552)

	Clusters						
	Well-Adapted t-Score	Average t Score	Adaptive Skills Deficits t-Score	Internalizing Problems t-Score	Mildly Disruptive t-Score	Disruptive Behavior Problems t-Score	Severe Problems t-Score
Externalizing							
Aggression	43.79	46.45	45.79	54.83	59.62	75.77[a]	77.17[a]
Hyperactivity	41.91	45.46	45.12	54.41	58.59	69.72[a]	72.04[a]
Conduct	44.84	45.93	46.88	52.64	53.80	71.08[a]	77.80[a]
Internalizing							
Anxiety	40.76	43.17	44.30	61.31[a]	44.91	53.41	71.22[a]
Depression	44.01	44.95	46.28	56.05	48.02	56.08	72.34[a]
Somatization	46.13	46.85	47.44	62.08[a]	48.19	51.92	79.49[a]
School problems							
Attention	39.63[a]	45.62	51.78	58.61	58.45	65.94[a]	67.54[a]
Learning	40.48	45.20	53.48	58.54	56.12	64.43[a]	68.08[a]
Other problem behaviors							
Atypicality	44.10	44.97	46.74	63.65[a]	50.96	66.28[a]	99.75[a]
Withdrawal	43.69	45.35	50.90	57.81	46.27	53.48	65.41[a]
Adaptive skills							
Leadership	59.41	47.40	37.26[a]	40.80	40.42	39.07[a]	42.17
Social skills	60.81[a]	48.89	39.51[a]	43.81	39.91[a]	36.16[a]	40.34
Study skills	61.94[a]	51.05	40.80	42.15	40.03	36.48[a]	38.84[a]
N (% of total sample)	419 (16.4)	639 (25.0)	413 (16.2)	305 (12.0)	478 (18.7)	219 (8.6)	79 (3.1)
Boys N (% of cluster)	126 (30.1)	253 (39.6)	211 (51.1)	163 (53.4)	296 (61.9)	164 (74.9)	44 (55.7)

Note: BASC = Behavior Assessment System for Children (Reynolds & Kamphaus, 1992).
a. t-Scores that are 1 or more standard deviations above or below the mean.

Cluster 3, labeled Adaptive Skills Deficits, presented a similar profile to the Average cluster except that students in Cluster 3 had lower adaptive skills, scoring about 1 *SD* below the mean. It contained 16.2% of the sample; 48.9% of the students in this cluster were girls.

Cluster 4 was labeled Internalizing Problems. This cluster was characterized by elevated internalizing behaviors (anxiety, depression, and somatization), modestly elevated school problems (attention and learning problems), low adaptive skills, and high atypicality. It contained 12% of the sample, and 46.6% of the students in this cluster were girls.

Cluster 5, labeled Mildly Disruptive, consisted of students with mild externalizing problems and school problems, as well as moderately poor adaptive skills. It contained 18.7% of the sample, and 38.1% of the students in this cluster were girls.

Cluster 6, named Disruptive Behavior Problems, was defined by strongly elevated externalizing scales, elevated school problems, and very low adaptive skills. It contained 8.6% of the total sample, and 25.1% of the students in this cluster were girls.

Cluster 7 was named Severe Problems. Students in this cluster were perceived by teachers as having high levels of problems across all scales (approximately 2 *SD*s above the mean), as well as poor adaptive skills. This cluster contained the smallest number of students (3.1%), 44.3% of whom were girls.

Discussion

The goal of this study was to examine a typology of maladaptive and adaptive behaviors among a large sample of at-risk sixth graders using the teacher ratings scales of the BASC. Previous studies using teacher ratings have been conducted with a U.S. normative sample of children aged 6 to 11 years (Kamphaus et al., 1997) and with a large sample of urban, diverse elementary school students (Tolan & Henry, 1996). The present study expanded the prior research from middle childhood samples to a sample of early adolescents, most of whom attended schools located in areas characterized by low income and high rates of crime and violence.

Despite differences in the characteristics of samples and developmental stages, the typology observed with this sample was similar to that found by Kamphaus et al. (1997; see Table 2). Both studies identified the Well-Adapted and the Average cluster with similar characteristics. However, the combined percentage of children in these clusters differed. The percentage of students in these two "positive" clusters was lower in our study (41%) than in the national sample (53%), most likely reflecting the more high-risk characteristics of our sample. Both studies also found three clusters with increasing levels of behavioral problems: Mildly Disruptive, Disruptive Behavior Problems, and Severe Problems, and with very similar characteristics. In our study, however, the Mildly Disruptive cluster scored about one standard deviation below the mean in adaptive skills which is substantially lower than the corresponding cluster in the national study. In addition, the Disruptive Behavior Problems cluster in the present study was not elevated on depression and significantly high on atypicality, which differs from the cluster found by Kamphaus et al. This result is surprising given that aggression and depression are associated (Espelage, Bosworth, & Simon, 2001; Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999; Kelder et al., 2001) and that rate of depression increases with age (Compas & Hammen, 1996). It is plausible that middle school teachers may have greater difficulty recognizing internalizing problems over obvious, visible externalizing problem behaviors as they spend less time interacting with individual students than elementary school teachers.

The remaining two clusters identified in this study differed from those found by Kamphaus et al. (1997). The Adaptive Skills Deficits cluster is unique to our study. Adolescents in this cluster did not exhibit behavioral problems but had few behavioral assets. Kamphaus et al. identified the Learning Disorder cluster with similar characteristics, but with elevated scores in the two

Table 2. A Comparison of Typologies Between the Present Study and Kamphaus et al. (1997)

	Percentage of Sample	
Cluster	Present Study	Kamphaus et al. (1997)
Well-adapted	16	34
Average	25	19
Adaptive skills deficits	16	12[a]
Internalizing problems	12	11[b]
Mildly disruptive	19	12
Disruptive behavior problems	9	8
Severe problems	3	4

Note: The proportions that each cluster represents of the sample were rounded to the nearest whole number.
a. Learning disorder.
b. Physical complaints/worry.

School Problems scales. The other differing cluster was the Internalizing Problems cluster. In our study, this cluster was characterized by high anxiety, somatization, and atypicality, whereas the Physical Complaints/Worry cluster from Kamphaus et al. also showed high scores in the internalizing variables, but no elevated scores in atypicality.

Our findings are also comparable with Tolan and Henry (1996). For example, the Average cluster in our study is similar to the No Aggression group in the Tolan and Henry study, and the Severe Problems cluster in our study is similar to the Aggression, Thought Problems, and Other Problems group in the Tolan and Henry study. However, the number of types of adjustment found in our study is larger than that in Tolan and Henry (i.e., 7 vs. 4). This may be attributed to our inclusion of both positive and negative behaviors, whereas Tolan and Henry focused only on negative behaviors. The comprehensive array of behaviors included in this study may have led to greater differentiation among patterns of behavioral adjustment. For example, in contrast to Tolan and Henry who found only one normally developing group (i.e., No Aggression), this study found three clusters representing the "normal" adolescents including Well-adapted, Average, and Adaptive Skills Deficits.

Overall, this study examining a typology of at-risk early adolescents based on teacher ratings of the BASC demonstrates stability of the typology of children from the national standardized sample of teacher ratings of the BASC (i.e., Kamphaus et al., 1997). Along with stability, we also found some minor variations from the national study. For example, in this study, teachers rated fewer students in the "positive" clusters and rated more students as having fewer assets. Though we do not directly address why those differences exist and acknowledge the complexity of unknown variables, we think that the differences may be a reflection of the challenges and stress of living in higher-risk environments. We also think that the differences might be attributed to several variables, including differences in age and differences in measures.

Implications for practices are as follows. The clusters identified in this study may have important utility as a means of designing and evaluating social, academic, and behavioral interventions. Although the concept of clusters has been present in the education, psychology, and public health literature, the development of interventions for specific clusters and the evaluation of program effectiveness by cluster have been virtually nonexistent. Traditionally, program developers and researchers select children who are in need of social, academic, or behavioral interventions based on a single characteristic. However, the cluster methodology simultaneously considers a host of child characteristics in a cognitively efficient way. Clustering may provide a more specific tool by evaluating whether effects differ by student typology.

Moreover, results from this study of low-income minority students indicate that more than half of the students were represented in clusters characterized by low behavior problems (Well-Adapted, Average, and Adaptive Skills Deficit). Despite the absence of behavioral problems, students in the Adaptive Skills Deficit cluster might still require intervention. Teachers and parents may not adequately recognize the psychosocial need of these students because of them being less "problematic." It is possible that these students become maladjusted over time, especially when the level of life stress increases. Therefore, for prevention purposes, these students are likely to benefit from empowerment programs that focus on improving leadership and academic and social skills.

There are some limitations of the current study. We acknowledge that the findings are based on a previous version of the scale (i.e., the BASC) and may not apply to the BASC-2 (Reynolds & Kamphaus, 2004). The BASC was the only scale available in 2001 when the data were collected. One of the changes occurred in the revision of adolescent TRS is the addition of two adaptive scales (Functional Communication and Adaptability). Because a typology of adolescents based on teacher ratings of the BASC or the BASC-2 has not been published, it is unknown whether and how the change has an impact on the taxonomy. Despite this limitation, the present study can be still relevant for current research and practice, as the teacher rating of the BASC-2 inherited many features from the original BASC (Reynolds & Kamphaus, 2004). This study also offers important information that will link to prior literature using the BASC, as we know little about typologies of early adolescents based on the BASC for youth living in disadvantaged communities.

Another limitation of the present study is that the clusters lack external validation. In other words, it should be demonstrated that the teacher-rated typology can be differentiated on adjustment outcomes in a meaningful way. In the next investigation, we plan to examine whether various self-reported behaviors and attitudes differ by the cluster based on teacher reports. As the study of validity is an on-going process, continuing research is needed to accumulate evidence that verifies the validity of the clusters.

More research is also needed to examine the developmental course of the identified clusters over time. The availability of longitudinal data collected in the project will enable us to address this important research question. It is anticipated to find both stability and change in cluster membership within some limits, given developmental predictability and malleability. Developmental processes are complex as a result of dynamic interactions between persons and environments, and we should always be mindful of unexpected changes. Yet it is predicted that most individuals, if there is change, would likely move to a cluster close to their previous membership, such as moving from Well-Adapted to Average or from Disruptive Behavior Problems to Mildly Disruptive. Most important, more research is needed to understand individual, environmental, or the rater variables that could influence changes in clusters.

Psychology and Neuroscience); University of Georgia, Athens, GA: Arthur M. Horne, PhD (Department of Counseling and Human Development Services); Pamela Orpinas, PhD (Department of Health Promotion and Behavior); Roy Martin, PhD (Department of Educational Psychology and Instructional Technology); William H. Quinn, PhD (Clemson University); University of Illinois at Chicago, Chicago, IL: Patrick H. Tolan, PhD; Deborah Gorman-Smith, PhD; David B. Henry, PhD; Franklin N. Gay, MPH, Michael Schoeny, PhD (all Institute for Juvenile Research, Department of Psychiatry); Virginia Commonwealth University, Richmond, VA: Albert D. Farrell, PhD; Aleta L. Meyer, PhD (National Institute on Drug Abuse); Terri N. Sullivan, PhD; Kevin W. Allison, PhD (all Department of Psychology).

Declaration of Conflicting Interests

Funding

References

Achenbach, T. M. (1991). *Teacher's Report Form*. Burlington, VT: Author.

Achenbach, T. M. (1995). Empirically based assessment and taxonomy: Applications to clinical research. *Psychological Assessment*, *7*, 261-274.

Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology: A review and analysis of empirical efforts. *Psychological Bulletin*, *85*, 1275-1301.

Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Beverly Hills, CA: Sage.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders*. (4th ed., text revision). Washington, DC: Author.

Bergman, L. R. (2000). The application of a person-oriented approach: Types and clusters. In L. R. Bergman, R. B. Cairns, L. Nilsson, & L. Nystedt (Eds.), *Developmental science and the holistic approach* (pp. 137-154). Mahwah, NJ: Lawrence Erlbaum.

Bergman, L. R., & Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Development and Psychopathology*, *9*, 291-319.

Blashfield, R. K. (1998). Diagnostic models and systems. In A. S. Bellack, M. Hersen, & C. R. Reynolds (Eds.), *Comprehensive clinical psychology. Volume IV: Assessment* (1st ed., pp. 57-80). New York: Elsevier Science.

Blashfield, R. K., & Aldenderfer, M. S. (1988). The methods and problems of cluster analysis. In J. R. Nesselrode & R. B. Cattell (Eds.), *Handbook of multivariate experimental psychology* (pp. 447-473). New York: Plenum Press.

Cantwell, D. P. (1996). Classification of child and adolescent psychopathology. *Journal of Child Psychology and Psychiatry*, *37*, 3-12.

Compas, B. E., & Hammen, C. L. (1996). Child and adolescent depression: Covariation and comorbidity in development. In R. J. Haggerty, L. R. Sherrod, N. Garmezy, & M. Rutter (Eds.), *Stress, risk, and resilience in children and adolescents: Processes, mechanisms, and interventions* (pp. 225-267). New York: Cambridge University Press.

DiStefano, C., Kamphaus, R. W., Horne, A. M., & Winsor, A. P. (2003). Behavioral adjustment in the U.S. elementary school: Cross-validation of a person-oriented typology of risk. *Journal of Psychoeducational Assessment*, *21*, 338-357.

Edelbrock, C., & Achenbach, T. M. (1980). A typology of child-behavior profile patterns: Distribution and correlates for disturbed-children aged 6-16. *Journal of Abnormal Child Psychology*, *8*, 441-470.

Espelage, D. L., Bosworth, K., & Simon, T. R. (2001). Short-term stability and prospective correlates of bullying in middle-school students: An examination of potential demographic, psychosocial, and environmental influences. *Violence and Victims*, *16*, 411-426.

Fergusson, D. M., & Horwood, L. J. (1995). Predictive validity of categorically and dimensionally scored measures of disruptive childhood behaviors. *Journal of American Academy of Child & Adolescent Psychiatry*, *34*, 477-485.

Henry, D. B., Farrell, A. D., & Multisite Violence Prevention Project. (2004). The study designed by a committee: Design of the Multisite Violence Prevention Project. *American Journal of Preventive Medicine*, *26*, 12-19.

Huberty, C. J., DiStefano, C., & Kamphaus, R. W. (1997). Behavioral clustering of school children. *Multivariate Behavioral Research*, *32*, 105-134.

Kaltiala-Heino, R., Rimpela, M., Marttunen, M., Rimpela, A., & Rantanen, P. (1999). Bullying, depression, and suicidal ideation in Finnish adolescents: School survey. *British Medical Journal*, *319*, 348-351.

Kamphaus, R. W., & DiStefano, C. (2001). Evaluación multidimensional de la psicopathología infantíl. **[AQ: 2]** *Revista de Neuropsicología, Neuropsyqiatría y Neurociencias*, *3*, 85-98.

Kamphaus, R. W., DiStefano, C., & Lease, A. M. (2003). A self-report typology of behavioral adjustment for young children. *Psychological Assessment*, *15*, 17-28.

Kamphaus, R. W., Huberty, C. J., DiStefano, C., & Petoskey, M. D. (1997). A typology of teacher-rated child behavior for a national U.S. sample. *Journal of Abnormal Child Psychology*, *25*, 453-463.

Kamphaus, R. W., Petoskey, M. D., Cody, A. H., Rowe, E. W., Huberty, C. J., & Reynolds, C. R. (1999). A typology of parent rated child behavior for a national U.S. sample. *Journal of Child Psychology and Psychiatry*, *40*, 607-616.

Kelder, S. H., Murray, N. G., Orpinas, P., Prokhorov, A., McReynolds, L., Zhang, Q. et al. (2001). Depression and substance use in minority middle-school students. *American Journal of Public Health*, *91*, 761-766.

Kendell, R. E. (2002). Five criteria for an improved taxonomy of mental disorders. In J. E. Helzer, & J. J. Hudziak (Eds.), *Defining psychopathology in the 21st century: DSM-V and beyond* (pp. 3-17). Arlington, VA: American Psychiatric Publishing.

Kim, S., Kamphaus, R. W., & Baker, J. A. (2006). Short-term predictive validity of cluster analytic and dimensional classification of child behavioral adjustment in school. *Journal of School Psychology*, *44*, 287-305.

Lessing, E. E., Williams, V., & Gil, E. (1982). A cluster-analytically derived typology: Feasible alternative to clinical diagnostic classification of children. *Journal of Abnormal Child Psychology*, *10*, 451-482.

McDermott, P. A., & Weiss, R. V. (1995). A normative typology of healthy, subclinical, and clinical behavior styles among American children and adolescents. *Psychological Assessment*, *7*, 162-170.

McDermott, P. A., Marston, N. C., & Stott, D. H. (1993). *Adjustment scales for children and adolescents*. Philadelphia: Edumetric and Clinical Science.

Meyer, A. L., Allison, K. W., Reese, L. R. E., Gay, F. N., & Multisite Violence Prevention Project. (2004). Choosing to be violence free in middle school: The student component of the GREAT schools and families universal program. *American Journal of Preventive Medicine*, *26*, 20-28.

Miller-Johnson, S., Sullivan, T. N., Simon, T. R., & Multisite Violence Prevention Project. (2004). Evaluating the impact of interventions in the Multisite Violence Prevention Study—Samples, procedures, and measures. *American Journal of Preventive Medicine*, *26*, 48-61.

Milligan, G. W., & Cooper, M. C. (1987). Methodology review: Clustering methods. *Applied Psychological Measurement*, *11*, 329-354.

Multisite Violence Prevention Project. (2004). The Multisite Violence Prevention Project: Background and overview. *American Journal of Preventive Medicine*, *26*, 3-11.

Orpinas, P., Horne, A. M., & Multisite Violence Prevention Project. (2004). A teacher-focused approach to prevent and reduce students' aggressive behavior—The GREAT Teacher Program. *American Journal of Preventive Medicine*, *26*, 29-38.

Quay, H. C. (1964). Personality dimensions in delinquent males as inferred from the factor-analysis of behavior ratings. *Journal of Research in Crime & Delinquency*, *1*, 33-37.

Reynolds, C. R., & Kamphaus, R. W. (1992). *BASC—Behavior Assessment System for Children: Manual*. Circle Pines, MN: American Guidance Service.

Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior Assessment System for Children* (2nd ed.). Circle Pines, MN: American Guidance Service.

Silk, J. S., Nath, S. R., Siegel, L. R., & Kendall, P. C. (2000). Conceptualizing mental disorders in children: Where have we been and where are we going? *Development and Psychopathology*, *12*, 713-735.

Smith, E. P., Gorman-Smith, D., Quinn, W. H., Rabiner, D. L., Tolan, P. H., Winn, D. M. et al. (2004). Community-based multiple family groups to prevent and reduce violent and aggressive behavior: The GREAT Families Program. *American Journal of Preventive Medicine*, *26*, 39-47.

Tolan, P. H.,& Henry, D. B. (1996). Patterns of psychopathology among urban poor children: Comorbidity and aggression effects. *Journal of Consulting and Clinical Psychology*, *64*, 1094-1099.

Bios

[AQ: 3]