

CONVERGENT AND DIVERGENT VALIDITY OF THE ADJUSTMENT SCALES FOR CHILDREN AND ADOLESCENTS AND THE PRESCHOOL AND KINDERGARTEN BEHAVIOR SCALES

Gary L. Canivez
Eastern Illinois University

Sarah E. Bordenkircher
University of Illinois at Springfield

Convergent and divergent (construct) validity of the Adjustment Scales for Children and Adolescents (ASCA) and the Preschool and Kindergarten Behavior Scales (PKBS) is reported. With a random sample of 154 five- and six-year-old children rated by 16 classroom teachers in a midwestern state, convergent evidence of construct validity was provided for the PKBS Externalizing Problems scale and the ASCA Overactivity syndrome. Divergent evidence of construct validity was provided for the

PKBS Externalizing Problems scale and ASCA Underactivity syndrome. Convergent and divergent evidence of construct validity for the PKBS Internalizing Problems scale and ASCA Overactivity and Underactivity syndromes was mixed. Specific scale comparisons found the ASCA to result in significantly higher mean ratings than the PKBS in 9 of 10 specific comparisons, and the effect sizes η^2 were moderate to large.

In recent years, there has been increased emphasis on providing educational and psychological assessment and intervention services to children during early childhood. In addition, psychologists' utilization of behavior rating scales has also increased due to the growing preference for objective, rather than inferential, assessment techniques that can facilitate a link between assessment and intervention (Piacentini, 1993; Reschly & Ysseldyke, 1995). Behavior rating scales have gained widespread acceptance among child assessment specialists for identification and placement of socially or emotionally disturbed youths (Hart & Lahey, 1999; McDermott, 1995; Merrell, 1994a); among school psychologists, they are the most frequently utilized instruments to assess the emotional and behavioral difficulties of children (Stinnett, Havey, & Oehler-Stinnett, 1994). Behavior rating scales are one of the most efficient ways to

This research was supported in part by a 1999 Eastern Illinois University Department of Psychology Small Grant to the first author and a 1999 Eastern Illinois University Undergraduate Research Award to the second author. Preliminary results of this study were presented at the 2000 Annual Convention of the American Psychological Association, Washington, DC.

Correspondence regarding this article should be addressed to Gary L. Canivez, Department of Psychology, 600 Lincoln Avenue, Charleston, IL 61920-3099. Dr. Canivez may also be contacted via E-mail at cfglc@eiu.edu or the World Wide Web at <http://www.ux1.eiu.edu/~cfglc>.

identify a referred student's behavioral strengths and weaknesses (Knoff, 1995), and they have been designated a "best practice" in assessing child behavioral and emotional problems (McConaughy & Ritter, 1995).

Behavior rating scales offer reasonably unobtrusive evaluations of students' behaviors within school and home settings. Teachers are natural observers and informants within school contexts because they have comparative experiences of observing many students across time and in varied social contexts. Further, they seem to utilize a normative perspective while rating children's behaviors (Piacentini, 1993). Teachers have often been considered to be among the most accurate adult raters of child behavior (Kamphaus & Frick, 1996; Martin, Hooper, & Snow, 1986).

One relatively new behavior rating scale specifically developed for early childhood use is the Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994b). The PKBS is a nationally normed behavior-rating instrument designed to measure social skills and problem behaviors in the early childhood population (ages 3 through 6 years). The PKBS is completed by parents, teachers, or others familiar with the child. According to Merrell (1995), the PKBS appears to adequately measure the constructs of both internalizing and externalizing problem behaviors in early childhood and also to show promise as a research tool, screening device, and assessment instrument for assessing the social-emotional behavior of children.

The PKBS includes a 34-item Social Skills scale and a 42-item Problem Behavior scale. The Social Skills scale is comprised of Social Cooperation, Social Interaction, and Social Independence subscales. The Problem Behavior scale comprises an Externalizing Problems scale that consists of the Self-Centered/Explosive, Attention Problems/Overactive, and Antisocial/Aggressive subscales and an Internalizing Problems scale that consists of Social Withdrawal and Anxiety/Somatic Problems subscales. Standard scores ($M = 100$, $SD = 15$) and percentiles are provided for the Social Skills Total and Problem Behavior Total; percentiles only are provided for the Externalizing Problems and Internalizing Problems scales. Subscales do not have standard scores or percentiles provided. Items are rated on a 4-point scale (*never*, *rarely*, *sometimes*, and *often*) based on the rater's perception of the frequency of the behavior specified.

Psychometric information from the PKBS manual (Merrell, 1994b) indicates high internal consistency estimates ($r_\alpha \geq .90$) for all Problem Behavior scales except the two Internalizing Problems subscales ($r_\alpha > .80$). Stability estimates over 3-week and 3-month intervals ranged from .62 to .70 ($Mdn_r = .66$) for the Social Skills subscales. Stability estimates obtained for the Externalizing Problems and Internalizing Problems scales were generally higher, with correlations ranging from .36 to .87 ($Mdn_r = .78$). Mean differences across the retest interval were not reported, so *level* of agreement (McDermott, 1988) across the retest interval cannot be assessed. Interrater agreement was higher between preschool teachers and their aides than between preschool teachers and parents based on correlations (Merrell, 1994b); however, mean differences between the raters were not reported, so the *level* of interrater agreement (McDermott, 1988) is unknown.

Several validity studies are presented in the PKBS manual (Merrell, 1994b). Moderate to strong correlations (.32 to .76) between the PKBS Social Skills scales and the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) social skills scales were noted. A wider range of correlations was observed between the PKBS Problem Behaviors scales and SSRS problem behaviors scales (.25 to .83), and the highest correlation was between the overall composite problem behavior totals. Comparison of the PKBS with the Conners Teacher Rating Scales (CTRS-39; Conners, 1990) showed many moderate to high correlations between the problem behavior scales. Moderate to highly negative correlations were observed between the PKBS Social Skills scales and the CTRS-39 dimensions (Merrell, 1994b). Subsequent studies (Jentzsch & Merrell, 1996; Merrell, 1995b; Merrell & Holland, 1997; Merrell & Wolfe, 1998) have provided additional empirical support for both the convergent and divergent validity of the PKBS.

Another recently developed behavior rating scale is the Adjustment Scales for Children and Adolescents (ASCA; McDermott, Marston, & Stott, 1993). The ASCA is a nationally normed behavior-rating instrument designed to assess psychopathology in youths aged 5 through 17 (kindergarten through Grade 12). The ASCA defines psychopathology through multisituational expression of problem behaviors assessed by having raters indicate which specific behaviors typify the child in a variety of circumstances and contexts (McDermott, 1993, 1994). Most other behavior rating scales indicate the observer's general impression of a behavior but do not clarify specific circumstances or multiple contexts.

The ASCA contains 156 items, 97 of which are scorable for dimensions of psychopathology and, based on factor analyses, are singularly assigned to one of six core syndromes or two supplementary syndromes. The six core syndromes, which have been found to be reliable across gender, age, and race/ethnicity (McDermott, 1993, 1994), include Attention Deficit-Hyperactive (ADH), Solitary Aggressive-Provocative (SAP), Solitary Aggressive-Impulsive (SAI), Oppositional-Defiant (OPD), Diffident (DIF), and Avoidant (AVO). These six core syndromes also combine to form two composite (second-order) or overall adjustment indexes: Overactivity (ADH, SAP, SAI, and OPD syndromes) and Underactivity (DIF and AVO syndromes). Delinquency (DEL) and Lethargic-Hypoactive (LEH) make up the two supplementary syndromes that are reliable for certain subgroups in the population. Core syndromes, supplementary syndromes, and overall adjustment scales are reported as normalized *T* scores ($M = 50$, $SD = 10$) and percentiles.

The ASCA manual (McDermott, 1994) provides extensive reliability and validity evidence. Internal consistency estimates for the total standardization sample ranged from .68 to .86 for the six core syndromes and two supplementary syndromes. Alpha coefficients equaled .92 for the Overactivity scale and .82 for the Underactivity scale. Test-retest reliabilities ($n = 40$) over a 30-school day interval ranged from .66 to .91 for the six core syndromes and from .75 to .79 for the Overactivity and Underactivity scales; no significant differences were observed in scores across the retest interval. Canivez, Perry, and Weller (2001) also found significant stability for the ASCA overall adjustment scales, core syndromes, and supplemental syndromes over a 60-day retest interval; mean

changes were less than .8 raw score points, replicating the findings of McDermott (1994). McDermott (1994) and Watkins and Canivez (1997) have also reported significant interrater agreement for ASCA syndrome *T* scores. Significant correlations were found for the core syndromes and global adjustment scales, and no clinically significant mean differences were found between raters.

Exploratory and confirmatory analyses support the factor structure at the item, core syndrome, and second-order levels (McDermott, 1993, 1994). Convergent and divergent validity studies with the ASCA have also yielded positive results. McDermott (1993, 1994) found validity coefficients that ranged from .65 to .91 when comparing the ASCA and the Revised Conners Teacher Rating Scale (CTRS; Trites, Blouin, & Laprade, 1982). All four of the ASCA overactive syndromes were highly correlated with the CTRS Hyperactivity and Conduct Problem factors. The low to near zero correlations between the Overactive and Underactive core syndromes of the ASCA revealed the divergent validity of these two dimensions (McDermott, 1993; 1994). Correlations between the ASCA and Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) were significant for similar psychological dimensions or constructs (McDermott, 1993, 1994). Additional evidence of construct validity for the ASCA has also been reported (McDermott, 1995; McDermott & Schaefer, 1996; McDermott & Spencer, 1997), and the scale demonstrated good diagnostic accuracy in differentiating students with emotional disturbance from matched normals, learning-disabled, speech/language-disabled, and gifted students (McDermott et al., 1995). In a study comparing the ASCA and PKBS, Canivez and Rains (2000) reported mixed results for 123 randomly selected preschool and kindergarten children. Construct validity support was noted for the ASCA Overactivity scales and PKBS Externalizing Problems scales, but the PKBS Internalizing Problems scales had higher correlations with the ASCA Overactivity scales than with the ASCA Underactivity scales.

Before behavior-rating scales can be validly used in everyday practice they, like other tests, must demonstrate acceptable psychometric properties. The psychometric results reported in test manuals also need to be replicated with independent research for practitioners to be more confident in their use. The Problem Behaviors dimensions of the PKBS and ASCA syndromes are similar in name and description. Additionally, the two instruments overlap for 5- and 6-year-old students. The purpose of the present study was to further investigate the convergent and divergent (construct) validity for the ASCA and the PKBS. In contrast to convergent validity, the term *divergent* validity (Kaplan & Saccuzzo, 2001) is preferred to *discriminant* validity (Campbell & Fiske, 1959) because the latter more appropriately refers to the ability of a test to *discriminate* between two or more groups (i.e., discriminant function analysis or logistic regression and subsequent diagnostic efficiency statistics), as recently illustrated by Youngstrom, Findling, Danielson, and Calabrese (2001). Divergent validity is also the term used by both McDermott (1994) and Merrell (1994b) in describing such research on the ASCA and PKBS, respectively.

The present study compared the two composite indexes from the ASCA, Overactivity and Underactivity, to the two PKBS broadband problem behavior scales, Internalizing Problems and Externalizing Problems. ASCA core syn-

dromes and PKBS subscales were also examined for convergent and divergent validity. It was hypothesized that:

1. Similar problem behavior scales (composites and subscales) from the PKBS and syndromes from the ASCA (composites, core syndromes, and supplemental syndromes) should be significantly and moderately to highly correlated (convergent validity).
2. Correlations between the PKBS Externalizing Problems and ASCA Overactivity syndromes should be higher than correlations between the PKBS Externalizing Problems and ASCA Underactivity syndromes (divergent validity).
3. Correlations between the PKBS Internalizing Problems and ASCA Underactivity syndromes should be higher than correlations between the PKBS Internalizing Problems and ASCA Overactivity syndromes (divergent validity).
4. The PKBS Social Skills scales and the ASCA syndromes should have significant and moderately negative correlations.
5. Mean scores from the PKBS Problem Behavior subscales and composites should not differ from similar ASCA syndromes.

METHOD

Participants

Preschool ($n = 2$), kindergarten ($n = 12$), and first-grade ($n = 2$) teachers agreed to rate 10 (5 male, 5 female) randomly selected students on both the ASCA and the PKBS. Normal ($n = 137$) and disabled ($n = 17$) students (80 male, 74 female) attending elementary schools in rural areas of the Midwest comprised the sample. The sample consisted of 5- ($n = 93$) and 6-year-old ($n = 61$) students ($M = 5.40$, $SD = .51$). The students were primarily Caucasian, based on demographics of the communities from which they were obtained; however, teachers unfortunately did not report the race/ethnicity of the students on the ASCA or PKBS rating forms.

Instruments

Adjustment Scales for Children and Adolescents. The Adjustment Scales for Children and Adolescents (ASCA; McDermott et al., 1993) is a standardized behavior assessment instrument that was normed on a representative national sample of 1,400 youths, blocked according to gender, age, and grade level. It is appropriate for use with youths aged 5 through 17 (grades K-12). The ASCA consists of six core syndromes (Attention Deficit-Hyperactive, Solitary Aggressive-Provocative, Solitary Aggressive-Impulsive, Oppositional Defiant, Diffident, and Avoidant) and two supplementary syndromes (Delinquent and Lethargic). The core syndromes are combined to form two composite indexes: Overactivity (Attention Deficit-Hyperactive, Solitary Aggressive-Provocative, Solitary Aggressive-Impulsive, and Oppositional Defiant syndromes) and Underactivity (Diffident and Avoidant syndromes). Raw scores are converted to normalized T scores. In general, psychometric characteristics of the ASCA are acceptable and meet standards for both group and individual decision making (Canivez, 2001; Salvia & Ysseldyke, 1995).

Preschool and Kindergarten Behavior Scales. The Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994b) was developed with a national sample

of 2,855 children from 16 different states that represented four geographic regions and was comparable to the general U.S. population (Merrell, 1995). The PKBS was designed for use with youths aged 3 through 6 and contains a Social Skills scale and a Problem Behavior scale. The Social Skills scale includes the Social Cooperation, Social Interaction, and Social Independence subscales. The Problem Behavior Scale includes both Internalizing Problems and Externalizing Problems. The Internalizing scale includes Social Withdrawal and Anxiety/Somatic Problems subscales; the Externalizing scale includes Self-Centered/Explosive, Attention Problems/Overactive, and Antisocial/Aggressive subscales. Watson (1998) provided generally favorable comments in reviewing the PKBS, whereas MacPhee (1998) was somewhat more critical, stressing the need for additional research before the PKBS is recommended for screening and diagnostic use.

Procedure

Sixteen classroom teachers from rural areas of a midwestern state volunteered to participate in the present study. The purpose, need, and details of data collection were explained to each teacher. The teachers were asked (and instructed how) to randomly select and rate five male and five female students who they had observed for at least 40 days prior to the completion of the ASCA and the PKBS. The teachers then rated the selected students according to the standard instructions on the rating forms and returned the forms to the second author, who scored them according to the test manuals. To protect the anonymity of the students, no personally identifiable information was collected. Teachers completed the ASCA and PKBS in counterbalanced order to control for possible order effects.

Analyses

The PKBS subtest and composite raw scores were converted to *T* scores ($M = 50$, $SD = 10$) based on raw score means and standard deviations for 5- and 6-year-olds provided by Merrell from the PKBS standardization sample so that PKBS and ASCA scores were in the same units. Although distributions for problem behaviors yielded by the PKBS and ASCA are skewed (as is the case in pathology-based scales), this would not seem to present a problem for the parametric statistics used in the present study given the large sample size (Glass & Hopkins, 1996; Welkowitz, Ewen, & Cohen, 1976). Pearson product-moment correlation coefficients were calculated to provide indexes of convergent and divergent validity. Dependent *t* tests for differences between means were calculated between similar scales of the PKBS and ASCA to assess differences between scores yielded by these different instruments. Effect sizes for the mean differences between the PKBS and ASCA were estimated using η^2 , an index of the proportion of variability explained by the differences (Kiehl, 1996).

RESULTS

Global Scale Comparisons

Pearson product-moment correlations between the ASCA and PKBS are presented in Table 1. The PKBS Externalizing Problems scale was significantly cor-

Table 1
Pearson Product-Moment Correlation Coefficients between the Preschool and Kindergarten Behavior Scales (PKBS) and the Adjustment Scales for Children and Adolescents (ASCA)

PKBS	Adjustment Scales for Children and Adolescents									
	OVR	UNR	ADH	SAP	SAI	OPD	DIF	AVO	DEL	LEH
Social Skills										
SC	-.81***	-.05	-.73***	-.72***	-.78***	-.69***	.04	-.25**	-.29**	-.39***
SInt	-.46***	-.45***	-.41***	-.29***	-.38***	-.40***	-.36***	-.52***	-.15	-.53***
SInd	-.57***	-.45***	-.52***	-.43***	-.52***	-.54***	-.39***	-.47***	-.24*	-.63***
Social Skills Total	-.70***	-.37***	-.63***	-.54***	-.63***	-.62***	-.28***	-.48***	-.25*	-.59***
Problem Behavior										
SC/E	.77***	.00	.60***	.68***	.78***	.79***	-.02	.14	.28**	.32***
AP/O	.83***	.09	.80***	.68***	.72***	.60***	.02	.25**	.21	.37***
A/A	.75***	.01	.59***	.72***	.73***	.73***	-.03	.17*	.31**	.25**
Externalizing Problems	.84***	.03	.71***	.74***	.79***	.76***	-.01	.20*	.28**	.34***
SW	.65***	.44***	.52***	.50***	.63***	.68***	.38***	.48***	.21	.59***
A/SP	.44***	.39***	.36***	.36***	.45***	.47***	.41***	.27***	.33**	.51***
Internalizing Problems	.58***	.44***	.47***	.45***	.57***	.61***	.42***	.40***	.29**	.58***

Note.—OVR = Overactivity; UNR = Underactivity; ADH = Attention Deficit-Hyperactive; SAP = Solitary Aggressive (Provocative); SAI = Solitary Aggressive (Impulsive); OPD = Oppositional Defiant; DIF = Diffident; AVO = Avoidant; DEL = Delinquent; LEH = Lethargic (Hypoactive); SC = Social Cooperation; SInt = Social Interaction; SInd = Social Independence; SC/E = Self-Centered/Explosive; AP/O = Attention Problems/Overactive; AA = Antisocial/Aggressive; SW = Social Withdrawal; A/SP = Anxiety/Somatic Problems.

N = 154, except for the ASCA Delinquency scale ($n = 82$) because the ASCA Delinquency scale is not scored for females under 12.

* $p < .05$. ** $p < .01$. *** $p < .001$.

related with the ASCA Overactivity syndrome ($r = .84, p < .001$) and supported convergent validity. The PKBS Internalizing Problems scale was significantly correlated with both the ASCA Overactivity syndrome ($r = .58, p < .001$) and the ASCA Underactivity syndrome ($r = .44, p < .001$). As expected, the PKBS Social Skills Total correlated negatively and significantly with the ASCA Overactivity ($r = -.70, p < .001$) and Underactivity ($r = -.37, p < .001$) syndromes.

Subscale Comparisons

Externalizing/Overactive scales. At the subscale level, a statistically significant correlation between the PKBS Attention Problems/Overactive (AP/O) scale and the ASCA Attention Deficit-Hyperactive (ADH) scale was observed ($r = .80, p < .001$). Statistically significant correlations were also observed between the PKBS Self-Centered/Explosive (SC/E) scale and the ASCA Solitary Aggressive-Provocative (SAP) ($r = .68, p < .001$), ASCA Solitary Aggressive-Impulsive (SAI) ($r = .78, p < .001$), and ASCA Oppositional Defiant (OPD) ($r = .79, p < .001$) syndromes. The PKBS Antisocial/Aggressive scale also had statistically significant correlations with the ASCA Solitary Aggressive-Provocative (SAP) ($r = .72, p < .001$), ASCA Solitary Aggressive-Impulsive (SAI) ($r = .73, p < .001$), and ASCA Oppositional Defiant (OPD) ($r = .73, p < .001$) syndromes. Low to near zero correlations were observed between the PKBS Externalizing Problems subscales (SC/E, AP/O, A/A) and the ASCA Diffident (DIF) and Avoidant (AVO) syndromes, supporting divergent validity of these dimensions.

Internalizing/Underactive scales. The PKBS Social Withdrawal (SW) scale was significantly correlated with the ASCA Avoidant (AVO) syndrome ($r = .48, p < .001$). The PKBS Anxiety/Somatic Problems (A/SP) scale was significantly correlated with the ASCA Diffident (DIF) syndrome ($r = .41, p < .001$). The PKBS Social Withdrawal (SW) and Anxiety/Somatic Problems subscales also correlated as high or higher with the ASCA Overactivity (ADH, SAP, SAI, and OPD) core syndromes (r s ranging from .36 to .68, $Mdn_r = .49$) than the ASCA Underactivity (DIF and AVO) core syndromes (r s ranging from .27 to .48, $Mdn_r = .40$).

Social Skills scales. As with the global scales/syndromes, and as hypothesized, the PKBS Social Cooperation (SC), Social Interaction (SInt), and Social Independence (SInd) subscales were significantly negatively associated with most ASCA syndromes. All Social Skills subscales were significantly ($p < .001$) correlated with the ASCA Overactivity (ADH, SAP, SAI, and OPD) core syndromes (r s ranging from -.29 to -.78, $Mdn_r = -.52$). Somewhat lower correlations were obtained between the PKBS Social Skills (SC, SInt, and SInd) subscales and the ASCA Underactivity (DIF and AVO) core syndromes (r s ranging from .04 to -.52, $Mdn_r = -.38$).

Mean Scale/Syndrome Comparisons

Table 2 presents the descriptive statistics and t test results for specific PKBS and ASCA comparisons. These comparisons were selected due to similarities in scale names and content. With the exception of the PKBS Social Withdrawal scale versus ASCA Avoidant syndrome comparison, all comparisons between the PKBS and ASCA scales were statistically significant. In each case, the PKBS resulted in significantly lower T scores than the ASCA. Effect sizes (η^2) for sig-

Table 2

Descriptive Statistics and t Tests for ASCA and PKBS Global Scale/Syndrome and Selected Subtest/Syndrome Comparisons

Scale/Syndrome	<i>M</i>	<i>SD</i>	<i>t</i>	η^2
ASCA Overactivity	55.69	11.99	16.47*	.64
PKBS Externalizing	46.59	11.94		
ASCA Underactivity	52.43	11.95	5.11*	.15
PKBS Internalizing	47.20	12.02		
ASCA Attention Deficit-Hyperactive	54.75	12.47	9.23*	.36
PKBS Attention Problems/Overactive	48.84	12.51		
ASCA Solitary Aggressive-Impulsive	52.84	10.55	12.95*	.52
PKBS Self-Centered/Explosive	45.00	11.78		
ASCA Oppositional Defiant	54.81	14.55	13.68*	.55
PKBS Self-Centered/Explosive	45.00	11.78		
ASCA Solitary Aggressive-Provocative	55.25	12.21	11.24*	.45
PKBS Antisocial/Aggressive	47.27	11.35		
ASCA Solitary Aggressive-Impulsive	52.84	10.55	8.60*	.33
PKBS Antisocial/Aggressive	47.27	11.35		
ASCA Oppositional Defiant	54.81	14.55	9.32*	.36
PKBS Antisocial/Aggressive	47.27	11.35		
ASCA Avoidant	49.95	10.52	0.27	.00
PKBS Social Withdrawal	50.20	11.92		
ASCA Diffident	53.12	11.62	8.14*	.30
PKBS Anxiety/Somatic Problems	44.97	11.29		

* $p < .05$ (Bonferroni adjusted $\alpha = .005$).

nificant contrasts were large (see Table 2), with significant mean differences ranging from .52 to .98 standard deviation units.

DISCUSSION

The present results provided strong convergent evidence of construct validity for the global PKBS Externalizing Problems scale and ASCA Overactivity syndrome with 71% shared variance. This result is similar to that found by Merrell (1994, 1995a) in comparisons with the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) problem behavior dimensions. As hypothesized, the PKBS Externalizing Problems scale and ASCA Underactivity syndrome produced a near zero ($r = .03$) correlation, providing divergent evidence of construct validity. This is a much lower correlation than was found between the PKBS Externalizing Problems scale and the SSRS Internalizing scale ($r = .46$) (Merrell, 1994b, 1995a).

At the subscale/core syndrome level, however, all PKBS Externalizing Problems subscales (SC/E, AP/O, and A/A) were significantly and moderately to highly correlated with all ASCA Overactivity core syndromes (ADH, SAP, SAI, and OPD). There appeared to be a large amount of overlap (shared variance) among these subscales, suggesting little differentiation. As hypothesized, the PKBS Externalizing subscales had much lower to near zero correlations with the ASCA Underactivity core syndromes (DIF and AVO), supporting divergent validity for these dimensions.

Convergent and divergent evidence of construct validity was mixed for the PKBS Internalizing Problems scale and ASCA Overactivity and Underactivity syndromes because there were generally equivalent correlations obtained between these scales (see Table 1). At the subtest/core syndrome level, the PKBS Internalizing Problems subscales (SW and A/SP) correlated as high with the ASCA Overactivity core syndromes (ADH, SAP, SAI, and OPD) as with the ASCA Underactivity core syndromes (DIF and AVO). It may be that better agreement between the externalizing dimensions of the PKBS and ASCA is a function of the fact that externalizing behaviors are readily observable and require substantially less inference on the part of the rater. These results are virtually identical to those found by Canivez and Rains (2000).

In order to further explore and explain the present results, correlations *within* the PKBS and ASCA were calculated to investigate the degree of overlap (shared variance) among the global scales and subscales within each behavior rating scale. Table 3 presents the intercorrelation matrix for the ASCA, and Table 4 presents the intercorrelation matrix for the PKBS.

As seen in Table 3, the ASCA Overactivity and Underactivity syndromes correlation ($r = .05$) indicated scale independence and distinct constructs. For the PKBS (see Table 4), the Externalizing Problems scale and Internalizing Problems scales correlation ($r = .69$) indicated almost 50% overlap between these scales, a finding also observed in the PKBS standardization sample ($r = .66$) (Merrell, 1994b). This overlap (shared variance) is also greater than that observed in the Behavior Assessment System for Children-Teacher Rating Scale (BASC-TRS; Reynolds & Kamphaus, 1992; $r = .46$) and greater than that obtained for the Child Behavior Checklist-Teacher Report Form (CBCL-TRF; Achenbach, 1991; referred children $M_r = .35$, nonreferred children $M_r = .41$). Canivez and Rains (2000) also found that the PKBS Externalizing Problems scale correlation with the Internalizing Problems scale ($r = .62$) was greater than the ASCA Overactivity and Underactivity syndromes correlation ($r = -.04$), suggesting greater ASCA overall adjustment scale independence.

At the subtest level, intercorrelations between the four ASCA Overactivity core syndromes (ADH, SAP, SAI, and OPD) were moderately high ($Mdn_r = .62$) and somewhat higher than those obtained in the ASCA standardization sample ($Mdn_r = .46$) (McDermott, 1994). Correlations between the three PKBS Externalizing Problems subscales (SC/E, AP/O, and A/A) were significantly higher than in the ASCA ($Mdn_r = .80$) and indicated greater scale overlap, as was observed in the PKBS standardization sample ($Mdn_r = .79$) (Merrell, 1994b). The correlation between the ASCA Underactivity core syndromes (DIF and AVO; $r = .47$) was somewhat higher than in the ASCA standardization sample ($r = .33$). The correlation between the PKBS Internalizing Problems subscales (SW and A/SP; $r = .76$) was significantly higher than for the ASCA (DIF and AVO) and somewhat higher than that observed in the PKBS standardization sample ($r = .64$) (Merrell, 1994b). Correlations between the ASCA Overactivity core syndromes and ASCA Underactivity core syndromes ranged from $-.08$ to $.23$ ($Mdn_r = .09$) and indicated independence of the ASCA Overactivity and Underactivity core syndromes. This was similar to what was found in the ASCA standardization sample ($Mdn_r = .06$). The correlations between the PKBS Externalizing Problems subscales and Internalizing

Table 3
 Pearson Product-Moment Correlation Coefficients among Adjustment Scales for Children and Adolescents (ASCA) Global Scales, Core Syndromes, and Supplementary Syndromes

	Adjustment Scales for Children and Adolescents (ASCA)									
	OVR	UNR	ADH	SAP	SAI	OPD	DIF	AVO	DEL	LEH
OVR										
UNR	.05									
ADH	.90***	.02								
SAP	.76***	.03	.64***							
SAI	.68***	-.01	.57***	.64***						
OPD	.74***	.14	.50***	.59***	.64***					
DIF	-.01	.90***	-.04	-.06	-.06	.08				
AVO	.21**	.75***	.18*	.18*	.13	.23**	.47***			
DEL	.32**	-.05	.26*	.23*	.29**	.38***	.00	-.05		
LEH	.44***	.56***	.41***	.30***	.22**	.38***	.51***	.52***	.00	

Note.—OVR = Overactivity; UNR = Underactivity; ADH = Attention Deficit-Hyperactive; SAP = Solitary Aggressive (Provocative); SAI = Solitary Aggressive (Impulsive); OPD = Oppositional Defiant; DIF = Diffident; AVO = Avoidant; DEL = Delinquent; LEH = Lethargic (Hypoactive).

N = 154, except for the ASCA Delinquency scale ($n = 82$) because the ASCA Delinquency scale is not scored for females under 12.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Pearson Product-Moment Correlation Coefficients among Preschool and Kindergarten Behavior Scales Subscales and Global Scales

	Social Skills					Problem Behaviors				
	Social Skills Total	SC	SInt	SInd	SC/E	AP/O	A/A	Externalizing Problems	SW	A/SP Internalizing Problems
Social Skills										
SC	.84***									
SInt	.88***	.56***								
SInd	.88***	.68***	.67***							
SS Total		.84***	.88***	.88***						
Problem Behavior										
SC/E	-.68***	-.82***	-.40***	-.58***						
AP/O	-.75***	-.84***	-.53***	-.59***	.80***					
A/A	-.61***	-.75***	-.37***	-.49***	.87***	.79***				
Ext. Prob.	-.73***	-.86***	-.46***	-.60***	.96***	.92***	.94***			
SW	-.79***	-.67***	-.61***	-.80***	.76***	.68***	.65***	.75***		
A/SP	-.59***	-.48***	-.42***	-.69***	.60***	.47***	.45***	.55***	.76***	
Int. Prob.	-.73***	-.61***	-.54***	-.79***	.72***	.61***	.58***	.69***	.94***	.94***

Note.—SC = Social Cooperation; SInt = Social Interaction; SInd = Social Independence; SC/E = Self-Centered/Explosive; AP/O = Attention Problems/Overactive; A/A = Antisocial/Aggressive; SW = Social Withdrawal; A/SP = Anxiety/Somatic Problems; Ext. Prob. = Externalizing Problems; Int. Prob. = Internalizing Problems.
 N = 154.

* $p < .05$ ** $p < .01$ *** $p < .001$.

Problems subscales ranged from .47 to .76 ($Mdn_r = .63$) and were similar to correlations found in the PKBS standardization sample ($Mdn_r = .55$) (Merrell, 1994b). These results were also similar to those reported in Canivez and Rains (2000).

The intercorrelations in this sample and in the respective standardization samples indicate that the ASCA core syndromes and overall adjustment syndromes demonstrated less overlap and thus greater independence than the PKBS subscales and global problem behavior scales. As such, the mixed evidence of convergent and divergent validity for the PKBS internalizing subscales and global Internalizing Problems scale and ASCA Underactivity core syndromes and global syndrome may be due to the greater overlap (shared variance) among all problem behavior scales (Externalizing Problems and Internalizing Problems) observed in the PKBS.

Comparisons of global scale and subscale means indicated that scores on the ASCA were significantly higher than on the PKBS, with the exception of the ASCA AVO and PKBS SW comparison. The differences also reflected moderate to large effect sizes (mean differences ranging from .52 to .98 standard deviation units, η^2 ranging from .15 to .64). One possible reason for this is a difference in the norms for these two nationally standardized instruments. The ASCA is exclusively a teacher report instrument, and the norms are based solely on teacher ratings. Teachers, parents, or others familiar with the child, however, may provide ratings on the PKBS, and the norms contain both teacher *and* parent ratings. Although differences between teacher and parent ratings were explored for 102 preschoolers rated by both teachers and parents and indicated mixed results (4 of 10 PKBS scales showing significant differences), it is unknown what differences are present in the PKBS norms for the full sample. It is possible that in the normative data, ratings by parents may have been different from ratings by teachers due to differences in perceptions, expectations, behavioral control, and settings where the child's behavior was observed. This could produce differences when comparing the PKBS to rating scales based on one type of informant (teacher), such as the ASCA or BASC-TRS (Reynolds & Kamphaus, 1992).

Another possible reason for significant differences between the ratings could be in the way in which items are rated or endorsed. The PKBS utilizes a 4-point rating scale for each item in which the rater provides an indication as to how frequently the child engages in the specified behavior. The ASCA provides contextually based questions and lists possible behaviors that the rater then selects as most representative for that child in a specific situation. Each behavior listed is a separate item that is dichotomously scored. It is possible that differences in the method of rating may also have had an effect on rating differences.

Practitioners using the ASCA and PKBS can be confident that the ASCA Overactivity syndromes and PKBS Externalizing scales are measuring similar dimensions of psychopathology; however, the ASCA Underactivity syndromes and PKBS Internalizing scales seem to measure different constructs. Indeed, ASCA Underactivity syndromes were specifically created to measure overt, observable behaviors and do not infer characteristics "internal" to the child. Given the lower intercorrelations among ASCA core and supplemental syndromes, interpretations of the ASCA core and supplemental syndromes seem

appropriate because they appear to measure relatively unique dimensions. However, interpretation of the PKBS may be limited to the global PKBS scales due to the substantial overlap of the subscales. Additional studies are needed to further explore the latent structures of these scales.

Results from this study should be evaluated in terms of several limitations. One limitation is that all students rated in the present study were from rural areas of the Midwest and were primarily Caucasian. This nonrepresentativeness limits generalizability to other racial/ethnic groups and geographic regions. Another limitation is that only 12 teachers volunteered to participate as raters of their randomly selected students. Thus, the sample of teachers is also limited and such a small number may have biased the results. A final limitation is that the PKBS and ASCA overlap only for 5- and 6-year-old children, thus representing a restriction of variability in age. To increase generalizability, future research comparing the PKBS and ASCA should utilize larger and more representative samples of teachers as well as larger and more representative samples of students. To further explore the construct validity of these two scales, joint exploratory factor analyses and confirmatory factor analyses may also be used to examine the latent dimensions measured by the subscales; increasing the sample size will facilitate such analyses.

REFERENCES

- Achenbach, T. M. (1991). *Manual for the Teacher's Report Form and 1991 Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Achenbach, T. M., & Edelbrock, C. (1983). *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. Burlington, VT: University of Vermont Department of Psychiatry.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81–105.
- Canivez, G. L. (2001). Review of the Adjustment Scales for Children and Adolescents. In J. Impara and B. Plake (Eds.), *The fourteenth mental measurements yearbook* (pp. 22–24). Lincoln, NE: Buros Institute of Mental Measurements, University of Nebraska.
- Canivez, G. L., Perry, A. R., & Weller, E. M. (2001). Stability of the Adjustment Scales for Children and Adolescents. *Psychology in the Schools*, 38, 217–227.
- Canivez, G. L., & Rains, J. D. (2000). *Construct validity of the Adjustment Scales for Children and Adolescents and the Preschool and Kindergarten Behavior Scales: Convergent and divergent evidence*. Manuscript submitted for publication.
- Conners, C. K. (1990). *Conners Rating Scales manual*. North Tonawanda, NY: Multi-Health Systems.
- Glass, G. V., & Hopkins, K. D. (1996). *Statistical methods in education and psychology* (3rd ed.). Needham Heights, MA: Allyn & Bacon.
- Gresham, F. M., & Elliott, S. N. (1990). *The Social Skills Rating System*. Circle Pines, MN: American Guidance Service.
- Hart, E. L., & Lahey, B. B. (1999). General child behavior rating scales. In D. Shaffer, C. P. Lucas, & J. E. Richters (Eds.), *Diagnostic assessment in child and adolescent psychopathology* (pp. 65–87). New York: Guilford.
- Jentzsch, C. E., & Merrell, K. W. (1996). An investigation of the construct validity of the Preschool and Kindergarten Behavior Scales. *Diagnostique*, 21, 1–15.
- Kamphaus, R. W., & Frick, P. J. (1996). *Clinical assessment of child and adolescent personality and behavior*. Boston: Allyn and Bacon.
- Kaplan, R. M., & Saccuzzo, D. P. (2001). *Psychological testing: Principles, applica-*

- tions, and issues (5th ed.). Belmont, CA: Wadsworth.
- Kiess, H. O. (1996). *Statistical concepts for the behavioral sciences* (2nd ed.). Boston: Allyn and Bacon.
- Knoff, H. M. (1995). Best practices in personality assessment. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology-III* (pp. 849–864). Washington, DC: National Association of School Psychologists.
- MacPhee, D. (1998). Review of the Preschool and Kindergarten Behavior Scales. In J. Impara and B. Plake (Eds.), *The thirteenth mental measurements yearbook* (pp. 769–771). Lincoln, NE: Buros Institute of Mental Measurements, University of Nebraska.
- Martin, R. P., Hooper, S., & Snow, J. (1986). Behavior rating scale approaches to personality assessment in children and adolescents. In H. M. Knoff (Ed.), *The assessment of child and adolescent personality* (pp. 309–351). New York: Guilford.
- McConaughy, S. H., & Ritter, D. R. (1995). Best practices in multidimensional assessment of emotional or behavioral disorders. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology-III* (pp. 865–877). Washington, DC: National Association of School Psychologists.
- McDermott, P. A. (1988). Agreement among diagnosticians or observers: Its importance and determination. *Professional School Psychology*, 3, 225–240.
- McDermott, P. A. (1993). National standardization of uniform multisituational measures of child and adolescent behavior pathology. *Psychological Assessment*, 5, 413–424.
- McDermott, P. A. (1994). *National profiles in youth psychopathology: Manual of Adjustment Scales for Children and Adolescents*. Philadelphia: Edumetric and Clinical Science.
- McDermott, P. A. (1995). Sex, race, class, and other demographics as explanations for children's ability and adjustment: A national appraisal. *Journal of School Psychology*, 33, 75–91.
- McDermott, P. A., Marston, N. C., & Stott, D. H. (1993). *Adjustment Scales for Children and Adolescents*. Philadelphia: Edumetric and Clinical Science.
- McDermott, P. A., & Schaefer, B. A. (1996). A demographic survey of rare and common problem behaviors among American students. *Journal of Clinical Child Psychology*, 25, 352–362.
- McDermott, P. A., & Spencer, M. B. (1997). Racial and social class prevalence of psychopathology among school-age youth in the United States. *Youth & Society*, 28, 387–414.
- McDermott, P. A., Watkins, M. W., Sichel, A. F., Weber, E. M., Keenan, J. T., Holland, A. M., & Leigh, N. M. (1995). The accuracy of new national scales for detecting emotional disturbance in children and adolescents. *The Journal of Special Education*, 29, 337–354.
- Merrell, K. W. (1994a). *Assessment of behavioral, social, and emotional problems*. New York: Longman.
- Merrell, K. W. (1994b). *Preschool and Kindergarten Behavior Scales*. Brandon, VT: Clinical Psychology Publishing Company.
- Merrell, K. W. (1995a). Relationships among early childhood behavior rating scales: Convergent and discriminant construct validity of the Preschool and Kindergarten Behavior Scales. *Early Education and Development*, 6, 253–264.
- Merrell, K. W. (1995b). An investigation of the relationship between social skills and internalizing problems in early childhood: Construct validity of the Preschool and Kindergarten Behavior Scales. *Journal of Psychoeducational Assessment*, 13, 230–240.
- Merrell, K. W., & Holland, M. L. (1997). Social-emotional behavior of preschool-age children with and without developmental delays. *Research in Developmental Disabilities*, 18, 393–405.
- Merrell, K. W., & Wolfe, T. M. (1998). The relationship of teacher-rated social skills deficits and ADHD characteristics among kindergarten-age children. *Psychology in the Schools*, 35, 101–110.

- Piacentini, J. (1993). Checklists and rating scales. In T. H. Ollendick & M. Hersen (Eds.), *Handbook of child and adolescent assessment* (pp. 82–97). Boston: Allyn and Bacon.
- Reschly, D. J., & Ysseldyke, J. E. (1995). School psychology paradigm shift. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology-III* (pp. 17–32). Washington, DC: National Association of School Psychologists.
- Reynolds, C. R., & Kamphaus, R. W. (1992). *Behavior Assessment System for Children*. Circle Pines, MN: American Guidance Service.
- Salvia, J., & Ysseldyke, J. E. (1995). *Assessment*. Boston: Houghton Mifflin.
- Stinnett, T. A., Havey, J. M., & Oehler-Stinnett, J. (1994). Current test usage by practicing school psychologists: A national survey. *Journal of Psycho-educational Assessment*, 12, 331–350.
- Trites, R. L., Blouin, A. G. A., & Laprade, K. (1982). Analysis of the Conners Teacher Rating Scale based on a large normative sample. *Journal of Consulting and Clinical Psychology*, 50, 615–623.
- Watkins, M. W., & Canivez, G. L. (1997). Interrater agreement of the Adjustment Scales for Children and Adolescents. *Diagnostic*, 22, 205–213.
- Watson, T. S. (1998). Review of the Preschool and Kindergarten Behavior Scales. In J. Impara and B. Plake (Eds.), *The thirteenth mental measurements yearbook* (pp. 771–773). Lincoln, NE: Buros Institute of Mental Measurements, University of Nebraska.
- Welkowitz, J., Ewen, R. B., & Cohen, J. (1976). *Introductory statistics for the behavioral sciences* (2nd ed.). New York: Academic Press.
- Youngstrom, E. A., Findling, R. L., Danielson, C. K., & Calabrese, J. R. (2001). Discriminative validity of parent report of hypomanic and depressive symptoms on the General Behavior Inventory. *Psychological Assessment*, 13, 267–276.