

PRESCHOOL CHILDREN'S LEARNING BEHAVIORS, CONCEPT ATTAINMENT, SOCIAL SKILLS, AND PROBLEM BEHAVIORS: VALIDITY EVIDENCE FOR PRESCHOOL LEARNING BEHAVIORS SCALE SCORES

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This study provides concurrent and predictive validity and test-retest reliability evidence for scores from the preschool teacher-completed Preschool Learning Behaviors Scale (PLBS; McDermott, Green, Francis, & Stott, 2002) using two regional samples of preschool children aged 3 to 5.5 years (*N*s of 61 and 70). Teacher ratings of social skills and problem behaviors were collected using the Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994), and estimates of preschoolers' basic concept attainment were obtained using the individually administered Bracken Basic Concept Scale (BBCS; Bracken, 1984). Results

indicated that preschoolers' adaptive learning behaviors were positively correlated with social skills and negatively associated with problem behaviors but were not significantly related to subsequent basic concept attainment. Four-week test-retest coefficients for the PLBS Total score and Competence Motivation, Attention/Persistence, and Attitude Toward Learning subscale scores were adequate. Results support the unique contribution of PLBS scores in understanding children's responses to learning activities in preschool classroom environments.

Assessment of preschool children is an important educational and legal issue, particularly following the passage of the No Child Left Behind Act (PL 107-110, 2002), which requires screening and identification of preschool children at risk for reading failure. The Individuals with Disabilities Education Act amendments (IDEA; PL 101-476, 1990; PL 105-17, 1997) also work to ensure early intervention services for preschool children demonstrating, or at risk for, developmental delays (Jentzsch & Merrell, 1996). A recent national survey of kindergarten teachers revealed substantial prevalence of difficulties among children transitioning into kindergarten (Rimm-Kaufman, Pianta, & Cox, 2000), so early identification of preschoolers with learning and behavioral needs is essential. Moreover, early social-emotional, behavioral, and interpersonal functioning have been linked to later psychopathology and classroom learning outcomes (De Rosier, Kupersmidt, & Patterson, 1994; Fantuzzo, Bulotsky, McDermott, Mosca, & Lutz, 2003). Screening programs aimed at identifying children who are at risk for early school failure have proliferated

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and have received widespread support from professionals and parents (Agostin & Bain, 1997; Keogh & Becker, 1973). Subsequent appropriate intervention can help prevent later educational failure as well as potential emotional and behavioral disorders (Barnett, Bell, & Carey, 1999; Thurlow & Gilman, 1999). One assessment tool that may be useful in screening programs is the Preschool Learning Behaviors Scale (PLBS; McDermott, Green, Francis, & Stott, 2000). The purpose of this study is to provide evidence of validity and reliability for PLBS scores.

IDEA (1997) mandates psychoeducational assessment with dependable instruments so that accurate early identification and intervention of educational, psychological, and social problems can occur. Unfortunately, preschool measures used to assess at-risk individuals often lack adequate psychometric properties (e.g., sufficient evidence of score reliability and validity, adequate norm samples; Nagle, 2000) and, without sound measures, a major concern is that inaccurate identification of at-risk children may occur (Satz & Fletcher, 1988). Although intelligence and school readiness tests have been widely used and are among the best normed and psychometrically sound instruments (Bracken & Walker, 1997), they provide little information about the child's classroom functioning and minimal, if any, insight into how the child approaches learning tasks, how his or her learning differs from other children, or what makes for good or poor learning, such as problem-solving flexibility and ability to sustain attention and persist on learning tasks (Birrell, Phillips, & Stott, 1985; McDermott, 1984). Moreover, results from these aptitude tests cannot provide practical information for designing interventions to avoid school failure that is predicted by such tests (Bagnato & Neisworth, 1991; Bronson, 1994).

Rather than relying solely on intelligence and aptitude measures, many educators are turning to alternate variables. Child development experts previously identified 29 components of social competence in young children (Anderson & Messick, 1974). In addition to motor, perceptual, language, memory, affective, and cognitive skills, these experts specified essential competencies in interpersonal relationships, attention, behavior control, problem-solving skills, flexible information processing, attitudes, and competence motivation as salient influences on children's adaptive development. Such competencies comport with constructs like social skills, learning behaviors, and problem behaviors that provide opportunities for successful remediation so as to improve basic learning skills, interpersonal interactions in the learning environment, and collateral academic achievement (Stott, 1981). Thus, three areas of young children's functioning that merit assessment include learning behaviors, problem behaviors, and social functioning.

Learning Behaviors

Social and task-related behaviors have been viewed by teachers as more critical for success than academic skills. Staying on task, interacting with peers, assisting others, sharing, and following directions are said to be important in

preschool competency (Del’Homme, Sinclair, & Kasari, 1994), and learning problems may reflect individuals’ poor responses when faced with the instructional and social demands present in the school or school-like environment (Glutting, Kelly, Boehm, & Burnett, 1989). Poor attention, failure to stop physical movement exhibited at inappropriate times, nervousness and fear of poor performance, and impulsivity with new, complex, or other task requests requiring reasoning are learning behaviors that can impede academic performance (Stott, Green, & Francis, 1983). If repeated faulty learning styles are evident, adverse academic effects are likely to ensue (Phillips, Stott, & Birrell, 1987). Thus, learning behaviors are observable responses to learning tasks that facilitate or hinder learning that can be modified or taught, such as problem-solving strategies, decision-making behaviors, and reactions to learning situations (Green, Francis, & Stott, 1984; McDermott & Beitman, 1984; Phillips et al., 1987).

Learning behaviors have been shown to contribute substantially to scholastic outcomes. Although learning behaviors are correlated with IQ, they remain unique from IQ and contribute to the prediction of academic achievement (Birrell et al., 1985; Leigh, 1995; McDermott, 1984; Phillips et al., 1987; Schaefer & McDermott, 1999; Stott et al., 1983). Using a kindergarten sample, Glutting et al. (1989) examined basic concepts, academic achievement, and learning behaviors across time and reported that basic concept knowledge was significantly related to future academic achievement as well as school adjustment as measured by learning behaviors. These learning behaviors alone cannot account for all school difficulties or failure; however, because such behaviors are malleable, interventions can be implemented to lessen the possibility of educational failure (McDermott, 1984; Stott, 1985). Given the predictive efficacy and the many positive aspects of learning style, various researchers (Birrell et al., 1985; Green & Francis, 1988; McDermott & Beitman, 1984; Phillips & Williams, 1983; Stott et al., 1983) have argued that measurement of learning behaviors should be incorporated when assessing young children. In addition, other behaviors that can interfere with attention and thinking, such as problem behaviors and poor social skills, should also be examined.

Problem Behaviors

Problem behaviors present in early childhood have demonstrated stability and can affect later social, emotional, and academic functioning (Campbell, 1995; Miller, Koplewicz, & Klein, 1997). Many problem behaviors exhibited by preschool children, including tantrums, defiance, inattentiveness, and aggression, reflect age-appropriate developmental changes and age-related frustrations (Egeland, Kalkoske, Gottesman, & Erickson, 1990; Miller et al., 1997). Behavior problems are relatively common in young children, given that roughly 10% to 15% of preschool children are rated as having mild to moderate behavior problems—a rate comparable to that found among school-age children (Campbell, 1995; Rose, Rose, & Feldman, 1989). Poor concentration, tantrums, disobedience, and overactivity may be common in children between

ages 3 and 5, but these behavior problems decrease among normal preschool children as they grow older (Anderson, 1983; Keenan & Shaw, 1997).

Social-emotional behavior of young children can be classified into two areas: adaptive and maladaptive behaviors (Achenbach, 1982), and it is noted that adaptational failure frequently contributes to child psychopathology (Mash & Dozios, 1996). Although preschool children's behavior has often been thought of as transient and unstable (Rose et al., 1989) and educators often believe that children outgrow their problems, research generally does not support that belief. Studies have shown that preschool behavior problems are stable, often persist into later childhood, and may even predict later psychopathology (Rose et al., 1989). Moreover, longitudinal studies indicate that behavior problems and associated academic difficulties of school-age children often emerge in the preschool years (Campbell, 1995; Del'Homme et al., 1994; Egeland et al., 1990; Rose et al., 1989).

Social Skills

Preschool children's social skills are increasingly included in assessments of social-emotional functioning. Although no single widely accepted definition of social skills exists (Gresham & Elliot, 1987; Libet & Lewinsohn, 1973; Merrell & Gimpel, 1998), most definitions incorporate the relationship between positive social behavior and positive outcomes (Merrell, 1995). A growing body of research documents that social skill development and appropriate peer interactions are important developmental milestones related to future adjustment (Merrell, 1995). For example, preschoolers' positive interactive peer play behaviors are associated with adaptive social skills and with subsequent school grades (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Hampton, 1999). Because social competence is now being viewed as important for success in school, social-emotional functioning is increasingly being considered a necessary component of screening and assessment of children (Caldwell & Pianta, 1991; Merrell, 1996), as well as a target for intervention (Agostin & Bain, 1997). Short- and long-term studies of social skills have provided evidence of both positive and negative outcomes, with negative consequences of inadequate social skills outweighing the positive outcomes of adequate social skills (Merrell & Gimpel, 1998). Notably, children with both social skill deficits and emotional/behavioral problems are at the greatest risk for long-term problems (Caldwell & Pianta, 1991).

Evaluation

Based on the literature, assessments that include cognitive, learning-related behavior, problem behaviors, and social skills are important to the early identification of children in need of intervention. Individual testing can determine cognitive functioning among young children; however, observed behavioral and social functioning are not generalizable from individual testing situations (Glutting & McDermott, 1988). Children should be assessed in their natural environments with measures that have adequate reliability and validity evi-

dence, and information from multiple sources, settings, and methods must be included (Bronson, 1994; Merrell, 1995). Observing the child in his or her customary environment reveals characteristics of the child's true, natural behavior (Knoff, Stollar, Johnson, & Chenneville, 1999). Such direct observations are often time-consuming, require extensive training, and may provide only a partial picture of the child's behavior in specific situations (Achenbach, 1988; Karoley, 1981; Martin, Hooper, & Snow, 1986). Given that self-report and interviews offer little use for young children because of their limited language capacity, insight, and reliability (Bagnato & Neisworth, 1991; Kamphaus & Frick, 2002), other methods of assessment are needed.

Behavior ratings are an alternate method frequently used to assess preschool children. Such scales require the informant, usually a parent or teacher, to generalize typical observations across time and rate the degree to which a particular child exhibits specific behaviors (Barkley, 1988). Scores can then be compared to a standardized group (Knoff et al., 1999). Use of rating scales is advantageous in that they are relatively objective and efficient (Kamphaus & Frick, 2002; Martin et al., 1986). Moreover, children's reactivity to the presence of unfamiliar observers in the classroom is eliminated when teachers complete ratings (Martin et al., 1986), and teachers have the added advantage of being aware of the learning attributes of similar-aged students (Aylward, 1994). Rating scales generally implement "user-friendly administration and scoring" (Elliot, Busse, & Gresham, 1993, p. 313) procedures and are more cost- and time-efficient in comparison to observations and interviews (Aylward, 1994). Despite these advantages and documented utility, it should be noted that rating scales' limitations of response bias (e.g., halo effects, leniency errors) and error variance remain (Anastasi, 1988; Martin et al., 1986). Due to the possible problems that may arise from the use of rating scales, or any form of assessment technique, it is essential to evaluate the reliability and validity of assessment instruments' scores.

The goal of this study was to provide additional reliability and validity estimates and evidence for the utility of the Preschool Learning Behaviors Scales (PLBS; McDermott, Green, Francis, & Stott, 2000) scores using concurrent and predictive comparisons of preschool learning behavior with measures of problem behaviors, social skills, and basic concept attainment. It was hypothesized that problem behaviors would be associated with maladaptive learning behaviors; conversely, social skills would be related to adaptive learning behaviors. Similarly, it was expected that PLBS scores would be positively related to basic concept score attainment. Some variability in scores associated with participants' sex and age was anticipated. It was also expected that test-retest reliability estimates for a 4-week interval would demonstrate adequate to strong score stability.

METHOD

Participants

Two samples of preschool children were used in this investigation (see Table 1). Sample 1 was comprised of 61 preschool children ages 3 to 5½ years enrolled in full- or half-day preschool programs. Participants were recruited from seven preschool classrooms in central and south central Pennsylvania by sending parent permission forms home with each child. Due to a low rate of return (22%), random selection of participants was not possible, and all children whose parents signed and returned consent forms to the researcher participated in this study. Because anonymity was assured to participants, further demographic data were not collected.

Table 1

Distribution of Participants in Each Sample by Age and Sex

Age	Sample 1 (N = 61)		Sample 2 (N = 70)	
	Male	Female	Male	Female
3	9	9	9	11
4	17	11	18	12
5	5	10	10	10
Subtotal	31	30	37	33

For Sample 2, 70 preschool children between the ages of 3 and 5½ years were recruited from four other half- and full-day preschools in central and southeastern Pennsylvania. Due to the low rate of consent form returns, random selection was not possible. Therefore, children between the ages of 3 and 5½ enrolled in participating preschools whose parents had given consent to participate and for whom sufficient PLBS information was collected were included in the study. The sample was 7% African American, 13% Asian American, 69% White, and 5% other ethnicities (4% did not volunteer ethnicity). Mean years of education was 16.64 for mothers and 17.05 for fathers (excluding the 4 mothers and 6 fathers for whom information was not provided). Most children lived in two-parent homes (83%) and 13% lived with a single parent (4% didn't provide this information). A subset of these participants ($n = 59$) also completed the Bracken Basic Concept Scale (Bracken, 1984).

Instrumentation

Preschool Learning Behaviors Scale. The Preschool Learning Behaviors Scale (PLBS; McDermott, Green, Francis, & Stott, 2000; McDermott, Leigh, & Perry, 2002) is a paper-and-pencil measure that contains 29 learning-related, observable behavioral items intended for use with preschoolers between the ages of 3 years 0 months and 5 years 6 months. Positive or neutral (6 items), as well as negative (23 items), behaviors are incorporated to reduce the possibility of a response set for the answers. Preschool teachers rate each item on a 3-point scale from *most often applies*, *sometimes applies*, to *doesn't apply*. Scale completion

takes approximately 10 minutes and should only be used after the teacher has observed and interacted with a child for, at minimum, 40 days for full-day programs and 50 days for half-day programs (Leigh, 1995). Further details on PLBS are available in McDermott et al. (2002). In brief, the PLBS was nationally normed on a stratified sample of 100 children ages 3 to 5 that was representative of U.S. Census data in the 1990s and included children with disabilities. Three factor analytically derived scales are scored: Competence/Motivation (11 items), Attention/Persistence (9 items), and Attitude Toward Learning (7 items), as well as a summary Total score. Each score displayed adequate evidence of internal consistency (coefficients ranged from .75 to .89) across all subgroups. Interrater reliability coefficients were sufficient (.57 to .73), and 3-week test-retest correlations were strong (.80 to .94). Evidence of PLBS score validity was also presented via statistically significant correlations with preschoolers' scores on the Differential Ability Scales (.15 to .34; Elliott, 1990). Similarly, PLBS scores were positively related to teacher-rated social skill scores (.33 to .76) and negatively related to problem behavior scores (-.32 to -.69) on the Preschool Social Skill Rating System (P-SSRS; Gresham & Elliot, 1990).

Preschool and Kindergarten Behavior Scales. The Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994) is an instrument designed to assess social competence and problem behaviors in preschool children between 3 and 6 years of age. The scales are comprised of 76 items that are scored on a 4-point scale of *never*, *rarely*, *sometimes*, and *often*. Teachers and parents serve as raters for the PKBS, which can be completed in approximately 8 to 12 minutes. According to the manual (Merrell, 1994), the PKBS was normed using a standardization sample of 2,855 preschool and kindergarten children comparable to the 1990 U.S. Census. Items on the PKBS have been divided into two factor analytically supported scales: a 34-item Social Skills scale (subscales include Social Cooperation, Social Isolation, and Social Independence) that reflects peer-related and adult-related forms of social competence, and a 42-item Problem Behavior scale that reflects internalizing and externalizing forms of problem behaviors (Riccio, 1995). The Problem Behaviors scale is differentiated into two broad-band scales and underlying narrow-band subscales: Internalizing (Social Withdrawal and Anxiety/Somatic Problems) and Externalizing Problems (Self Centered/Explosive, Attention Problems/Overactive, and Antisocial Aggressive).

In terms of technical properties, adequate internal consistency, test-retest reliability, and validity evidence have been presented for the PKBS scores (Riccio, 1995). Coefficients for internal consistency are strong at .96 or higher for the Social Skills and Problem Behavior scale scores (.81 to .97 for the subscales). Three-week test-retest coefficients were .58 for the Social Skills and .86 for the Problem Behavior scales, respectively, whereas 3-month coefficients were .69 and .78, respectively. Additional evidence of construct validity for the PKBS has been demonstrated by Jentzsch and Merrell (1996) via comparison of PKBS scores with those from the Teacher Report Form (Achenbach, 1991) and Walker-McConnell Scale of Social Competence and School Adjustment

(SSCSA; Walker & McConnell, 1995). Similarly, Merrell (1995) compared PKBS scores to Conners Teacher Rating Scale (Conners, 1990) scores and found modest to substantial negative relationships between social skills and internalizing problems. Children with moderate to high levels of internalizing problems had poorer social skills than did children in the standardization sample who did not display internalizing problems. Riccio (1995) concluded that the PKBS is a useful instrument for assessing social-emotional functioning for preschool and kindergarten children.

Bracken Basic Concept Scale. An individually administered scale for use with preschool and primary age children (2 years 6 months to 7 years 11 months), the Bracken Basic Concept Scale (BBCS; Bracken, 1984) was standardized on a sample of more than a thousand children stratified according to the 1980 U.S. Census. Diagnostic scales assess 258 basic concepts (e.g., colors, letters) grouped to form 11 distinct concept categories. An overall composite, a school readiness composite, and six concept category scores are produced, with a median internal consistency coefficient of .85 for subtest scores and .97 for composite scores. The BBCS manual reports split-half internal consistency coefficients ranging from .47 and .96 for subtest score items with a median reliability of .85, and .94 and .98 for the total test score with a median of .97. Stability coefficient estimates were .97 for the BBCS total score and between .67 and .98 (with a median of .91) for the subtest scores.

Procedure

For Sample 1 participants, center preschool teachers sent home permission forms, along with pre-addressed postage-paid envelopes, for the students in their classrooms. Signed consent forms were returned directly to the researcher, and those children whose parents returned consent forms participated in the study. Teachers were provided with the names of the students to be rated along with instructions and a packet for each child containing a copy of the PLBS and the PKBS presented in a counterbalanced order to reduce the possibility of order effects. Teachers rated an average of three participants, with a range of one to eight. Teachers were asked to answer all items on each measure, even if they did not seem to apply, and completed packets were then returned to the researchers.

For Sample 2 participants, once preschools and teachers agreed to take part in the study, letters explaining the study and parental consent forms were provided to the teachers for distribution to parents. Parents returned consent forms to the center. For each child for whom consent to participate in the study was received, PLBS rating forms were provided to the teachers and completed forms were returned to the researchers. Four weeks later, PLBS ratings were again sent to the teachers to complete. In all, 17 teachers participated as raters, each rating between 1 and 7 preschoolers. The BBCS was individually administered to a subsample of 59 preschoolers an average of 2.7 months (range = 2 months to 4.1 months) after the first PLBS rating. Data collected for each sample are summarized in Table 2.

Table 2
Measures Collected by Sample

Sample	Demographics	Data Collection Period			
		First		Second	
		PLBS	PKBS	PLBS ^a	BBCS ^b
1	Gender	<i>N</i> = 61	<i>N</i> = 61	N/A	N/A
2	Gender	<i>N</i> = 70	N/A	<i>N</i> = 70	<i>n</i> = 59
	Ethnicity				
	Parent education				
	Family constellation				

Note.—PLBS = Preschool Learning Behaviors Scale; PKBS = Preschool and Kindergarten Behavior Scale; BBCS = Bracken Basic Concept Scale.

^a Test-retest interval was 4 weeks.

^b Mean time from initial PLBS administration to subsequent administration of the BBCS was 2.7 months (range = 2.0 to 4.1 months).

Table 3
Mean Scores and Coefficient Alphas for Learning Behavior, Social Skill, Problem Behavior, and Basic Concept Subtests

Dimension	<i>M</i>	<i>SD</i>	α
Sample 1 (<i>N</i> = 61)			
PLBS Total <i>T</i> Score	47.6	8.4	.88
PLBS Competence Motivation <i>T</i> Score	50.6	8.6	.82
PLBS Attention/Persistence <i>T</i> Score	52.8	8.4	.78
PLBS Attitude Toward Learning <i>T</i> Score	53.0	8.8	.76
PKBS Social Skills Standard Score	106.2	9.8	.92
PKBS Social Cooperation Raw Score	30.6	4.2	.89
PKBS Social Interaction Raw Score	26.8	4.8	.85
PKBS Social Independence Raw Score	28.7	3.2	.79
PKBS Problem Behaviors Standard Score	94.7	13.1	.95
PKBS Internalizing Raw Score	10.1	7.3	.88
PKBS Social Withdrawal Raw Score	4.6	4.2	.84
PKBS Anxiety/Somatic Problems Raw Score	5.4	3.7	.74
PKBS Externalizing Raw Score	20.8	14.8	.95
PKBS Self Centered/Explosive Raw Score	9.2	6.6	.90
PKBS Attention Problems/Overactive Raw Score	6.9	5.1	.90
PKBS Antisocial Aggressive Raw Score	4.7	4.6	.89
Sample 2 (<i>N</i> = 70)			
Time 1 – PLBS Total <i>T</i> Score	51.9	9.7	.90
PLBS Competence Motivation <i>T</i> Score	51.3	8.5	.83
PLBS Attention/Persistence <i>T</i> Score	52.3	10.8	.90
PLBS Attitude Toward Learning <i>T</i> Score	50.9	8.4	.67
Time 2 ^a – PLBS Total <i>T</i> Score	52.7	9.8	.90
PLBS Competence Motivation <i>T</i> Score	52.2	9.3	.87
PLBS Attention/Persistence <i>T</i> Score	52.4	10.2	.86
PLBS Attitude Toward Learning <i>T</i> Score	51.9	7.5	.58
BBCS Total Standard Score ^b	104.5	13.3	.98

Note.—PLBS = Preschool Learning Behaviors Scale (*M* = 50, *SD* = 10); PKBS = Preschool and Kindergarten Behavior Scale (*M* = 100, *SD* = 15); BBCS = Bracken Basic Concept Scale (*M* = 100, *SD* = 15);

^a Test-retest interval was 4 weeks.

^b *n* = 59.

PLBS raw scores were coded 0, 1, or 2 based on the valence of the response option, and raw scores on the PLBS factors were summed and transformed into *T* scores ($M = 50$, $SD = 10$). Using the PKBS manual, raw scores for the Social Skills and Problem Behavior scales were converted into standard scores ($M = 100$, $SD = 15$). Similarly, BCCS scores were standardized according to the manual ($M = 100$, $SD = 15$).

RESULTS

The means and standard deviations for the PLBS *T* scores, PKBS Problem Behavior and Social Skills standard scores, and BCCS Total standard score are presented in Table 3. As a group, the children in these samples fell within the average range on each measure of learning behaviors, problem behaviors, social skills, and basic concept attainment. Cronbach's alpha coefficient was used to estimate internal consistency of select items contributing to each score (see Table 3), and results showed sufficient internal consistency for Sample 1 scores (per Salvia & Ysseldyke, 1995). However for Sample 2, the Attitude Toward Learning internal consistency coefficient was lower than expected (.67 and .58 at times 1 and 2, respectively).

The relationship of learning behaviors with social skills, problem behaviors, and basic concepts was assessed using correlation coefficients (see Table 4). Problem behaviors were negatively associated with adaptive learning behaviors on the PLBS; conversely, learning behaviors were substantially positively related to social skills as measured on the PKBS. Comparison of problem behaviors and learning behaviors revealed that 71% of the variance was unique to the PLBS; similarly, in comparison with social skills, 52% of the variance in PLBS scores was unique. To simultaneously assess possible sex and age effects, a 2 (sex) X 3 (age) MANOVA was computed with the PLBS Total *T* score and the PKBS Social Skills and Problem Behavior standard scores held as dependent variables. The results of the MANOVA revealed no significant findings for age, $F(6,106) = 0.752$, $p = .61$; sex, $F(3,53) = 1.302$, $p = .28$; or the age X sex interaction, $F(6, 106) = 0.573$, $p = .75$ for Sample 1.

Sample 2 permitted determination of a test-retest reliability estimate for the PLBS across a 4-week period. Resulting coefficients are presented in Table 5 for the total sample, as well as subsamples by age and sex. Stability coefficients ranging from .63 to .88 were all statistically significant at $p < .01$ or better. No mean level differences were found from time 1 to time 2 for any score. To examine possible effects on PLBS scores of age, sex, time, or their interactions in Sample 2, ANOVAs were applied. No statistically significant age, time, or interaction effects were evidenced for any of the PLBS scores for Sample 2, indicating that mean scores were similar between age groups and across the two rating times. Main effects were found for sex, with females scoring higher than males for the Total $F(1,136) = 9.279$, $p < .01$, Attention/Persistence $F(1,136) = 14.305$, $p < .01$, and Attitude Toward Learning scores $F(1,136) = 7.523$, $p < .01$. ANOVA revealed neither a main effect for time nor for the sex X time interaction for the Total, Competence Motivation, Attention/

Table 4
Pearson-Product Moment Correlations between Learning Behavior, Social Skill, Problem Behavior, and Basic Concept Scores

Preschool Learning Behaviors Dimension	Preschool and Kindergarten Behavior Scales					
	Social Skills ^a			Problem Behaviors ^a		
	Total Social Skills	Social Cooperation	Social Interaction	Total Problem Behavior	Social With-drawal	Anxiety/Somatic Problems
Total Score	.63**	.64**	.43*	.53**	-.52**	-.41*
Competence Motivation	.57**	.40	.43*	.57**	-.24	-.34
Attention/Persistence	.54**	.61**	.36	.43*	-.47**	-.27
Attitude Toward Learning	.53**	.63**	.34	.37	-.66**	-.52**
					-.50**	-.46**

Preschool and Kindergarten Behavior Scales

Preschool Learning Behaviors Dimension	Problem Behaviors ^a					
	Total Externalizing	Self Centered/ Explosive	Attention Problems/ Overactive	Antisocial Aggressive	Bracken Basic Concept Scale ^b	
Total Score	-.50**	-.47**	-.47**	-.43*	.23	
Competence Motivation	-.15	-.19	-.11	-.09	.22	
Attention/Persistence	-.51**	-.38	-.58**	-.45**	.18	
Attitude Toward Learning	-.63**	-.69**	-.48**	-.52**	.19	

Note.—Bonferroni correction has been applied to account for family-wise error.

^a $N = 61$.

^b $n = 59$.

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

Table 5
Preschool Learning Behavior Scale Test-Retest Reliability Coefficients for Total Sample and Subsamples by Age and Sex

PLBS Dimension	Age in Years					Sex	
	Total ($N = 70$)	3 ($n = 20$)	4 ($n = 30$)	5 ($n = 20$)	Male ($n = 37$)	Female ($n = 33$)	
Total Score	.82*	.85*	.81*	.80*	.75*	.86*	
Competence Motivation	.79*	.87*	.73*	.79*	.73*	.85*	
Attention/Persistence	.84*	.90*	.85*	.80*	.79*	.88*	
Attitude Toward Learning	.66*	.67*	.66*	.67*	.63*	.66*	

Note.—PLBS = Preschool Learning Behaviors Scale.

* $p < .01$.

Persistence, or Attitude Toward Learning scores. Test-retest correlations were also slightly lower for males than females; however, comparison of the dependent correlations using Fisher's *Z* transformation did not reveal significant difference.

DISCUSSION

As expected, learning behaviors were significantly related to both problem behaviors and social skills as rated by preschool classroom teachers. The negative correlation between problem behaviors and learning behaviors indicates that children who present troublesome classroom behaviors also tend to demonstrate faulty learning behaviors. Conversely, learning behaviors were positively related to social skills. Thus, children who demonstrate prosocial, appropriate interactions with peers also are more likely to engage in adaptive learning behaviors in the classroom. The patterns of relationships found in this study mirror those of prior work by McDermott et al. (2002) with the PLBS and P-SSRS (Gresham & Elliot, 1990).

Beyond the overall relationship determined by the total scores for each measure, patterns of subscale correlations for each instrument are also of interest. With the exception of the Attitude Toward Learning subscale, PLBS subscales' internal consistency coefficients were adequate, with coefficient alphas greater than .70. For the PLBS Competence Motivation dimension, the highest intercorrelation (.57) is with PKBS Social Independence. Given the component items of each subscale, it appears that preschoolers who demonstrate energy, engagement, independence, and interest in activities in the classroom may concomitantly display confidence, assertiveness, and positive peer interactions. PLBS Attention/Persistence was most highly correlated with PKBS Attention Problems/Overactive (-.58), which reflects that preschoolers' focus and concentration on activities negatively correlates with restless, impulsive, overactive problem behaviors. Lastly, PLBS Attitude Toward Learning dimension is substantially correlated (-.69) with PKBS Self-Centered/Explosive subscale. Inasmuch as component learning behaviors capture preschoolers' reactions to frustration, responsiveness to teachers, and cooperativeness with group activities, these are negatively associated with problem behaviors of volatility, oppositional defiance, and temperamental unpredictability.

Whereas approximately half of the variance in learning behaviors could be explained by social skills scores (48%), only 29% percent of the variance could be explained by problem behaviors. Closer inspection of the component items on each instrument does reveal some commonalities (e.g., PLBS items "Is willing to be helped," "Pays attention to what you say," and "Acts without taking sufficient time to look at the problem or work out a solution" are similar to PKBS Social Skills Scale items "Asks for help from adults when needed," "Follows instructions from adults," and "Acts impulsively without thinking," respectively). Although this pattern of association may indicate that a similar set of constructs or skills may underscore both instruments, it is apparent that each instrument taps unique constructs, given that 52% to 71% of the variance in PLBS scores remains unique. This finding supports the utility of preschool

learning behaviors as a distinct construct from either social skills or problem behaviors and comports with prior work by McDermott and Watkins (1988) that examined the relationship between learning behaviors and social adjustment. Thus, minimal overlap exists between problem behaviors and learning behaviors, but a closer relationship between learning behaviors and social skills exists among young children.

Although clear patterns of relationships between PLBS and PKBS subscales exist, it's important to remember that substantial individual variation can and will occur such that some children demonstrating poorer social skills may still engage in adaptive learning behaviors. Similarly, some children who typically engage in problem behaviors may still demonstrate adaptive learning behaviors. Inasmuch as learning behaviors have demonstrated predictive validity (e.g., Birrell et al., 1985; Schaefer & McDermott, 1999), application of the PLBS as a screening mechanism to identify preschool children with maladaptive responses to classroom activities would be beneficial in early identification of children who are at risk for learning difficulties. Moreover, preschool would be an ideal arena in which behavioral interventions could be implemented to improve children's faulty learning behaviors before substantial impact on their skill attainment can occur.

Prior work by Keenan and Shaw (1997) reported that longitudinal studies have shown that clear sex differences in behavior tend to emerge around age 4. In the present study, no sex differences were found in Sample 1, but sex differences were found for Sample 2 such that girls' learning behaviors were consistently rated more highly than boys'. No age-related differences were detected in this study. Among 5-year-olds and older school-aged children, learning behaviors also favor girls (Childs & McKay, 1997; McDermott & Schaefer, 1996), which aligns with social learning theory regarding differential reinforcement for appropriate behaviors based on child gender. This further affirms girls' tendencies to be more attentive to authority figures, to follow rules and instructions, and to try to please their teachers (Sadker & Sadker, 1995).

No statistically significant relationship was found between learning behaviors and basic concept attainment as measured on the BBCS. At this early age, perhaps it is encouraging that preschoolers' initial success in mastering letters, numbers, and other simple concepts such as size, shape, and color is unrelated to behavior in the preschool classroom. Among school-aged children, learning behavior has been shown to incrementally and interactively contribute with cognitive ability to the prediction of achievement and learning outcomes as measured by both teacher grades and standardized achievement measures (Schaefer & McDermott, 1999). However, because cognitive ability was not measured in the current study, it is not possible to assess how these constructs may relate to one another in this preschool sample, which is a limitation of the study.

Although this study provides some promising additional validity evidence for PLBS scores, there are some additional limitations that should be noted. First, it relies upon two small regional samples of preschool children and thus

the generalizability of results is restricted due to the size and composition of the samples. Further, source variance may influence results, because the same preschool teacher completed both the PLBS and PKBS. It is possible that rater subjectivity, opinions of child's behavior/skills in each area, or overall impression of the child could have influenced teachers' ratings on each instrument in a biasing manner. Lastly, the socioeconomic status and race/ethnic composition of the study are not fully known. Further demographic information about Sample 1 participants was unavailable; Sample 2 participants were primarily children with highly educated parents, which may have skewed distribution statistics and influenced the results. Childs and McKay (2001) addressed learning behaviors and SES as predictors of child outcomes and reported that although SES (measured by father employment level) and learning behavior ratings were not related per se, attention/distractibility among low SES boys was noted as a particular concern both at age 5 and 2 years later at age 7. A replication of the current study using a randomly selected, larger, more representative national sample in terms of age, sex, race/ethnicity, and socioeconomic status (SES) would permit further investigation of demographic variability, as well as improve generalizability.

There is an identified need for psychometrically sound preschool assessment instruments (Lutz, Fantuzzo, & McDermott, 2002), and future research providing additional information regarding the technical properties of the PLBS would be beneficial. Childs and McKay's (2001) work with school-aged youth affirmed prior work (e.g., Childs & McKay, 1997; Schaefer & McDermott, 1999) that demonstrated predictive validity for learning behaviors assessed at age 5. Although the present study provided additional concurrent-related validity evidence for the PLBS and expanded reliability estimates, further provision of predictive validity evidence is an essential area of future research. Specifically, such studies would highlight the utility of the PLBS as a screening measure to detect faulty learning behaviors among preschool children before they enter elementary school.

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