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# Confirmatory Factor Analysis of the *Preschool Behavioral and Emotional Rating Scale* (PreBERS) with Preschool Children with Disabilities

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## Abstract

The *Preschool Behavioral and Emotional Rating Scale* (PreBERS) is a standardized, norm-referenced instrument that assesses emotional and behavioral strengths of preschool children. This study investigated whether the PreBERS four-factor structure (i.e., emotional regulation, school readiness, social confidence, and family involvement) could be replicated with an early childhood special education (ECSE) sample of children. Teachers who participated in the study rated a total of 1,103 preschool children with disabilities. Confirmatory factor analysis determined the extent to which the ECSE data fit the original four-factor PreBERS structure identified with the national normative sample. Results indicated that the four-factor structure demonstrated an acceptable fit with the ECSE sample.

**Keywords:** assessment, behavior, preschool, disabilities, mental health

Effective assessment for preschool children requires the development of valid and reliable tools for collecting relevant behavioral, social, and environmental factors affecting children's targeted skills. Valid assessment in the domain of behavioral and emotional development is essential to allow early identification of children for whom special education and/or other mental health and treatment programs are needed to remediate or reduce the potential for developing emotional and behavioral disorders (EBD). Assessments of parenting strategies and child behavior skills in early childhood strongly predict behavioral outcomes such as internalizing and externalizing problems later in childhood (Ashford, Smit, van Lier, Cuijpers, & Koot, 2008; Belsky, Fearon, & Bell, 2007). Although behavioral assessments have traditionally relied on a deficit approach to identify problem behaviors that require remediation, an increasing priority has been placed on strength-based models to identify specific competencies that are either present or need support within a child's behavioral, social, and environmental system. Strength-based assessment is defined as "the measurement of those emotional and behavioral skills, competencies, and characteristics that

create a sense of personal accomplishment; contribute to satisfying relationships with family members, peers, and adults; enhance one's ability to deal with adversity and stress; and promote one's personal, social, and academic development" (Epstein & Sharma, 1998, p. 3). Strength-based approaches differ from strategies that focus on child internalizing and externalizing behaviors because they incorporate children's social and environmental supports as well as behavioral factors contributing to children's emotional and behavioral health.

## Strength-Based Assessment

A strength-based behavioral assessment approach goes beyond a deficit model in not only identifying children who are eligible for services but also evaluating which essential skills or supporting factors the child has available to help overcome that deficit. For children with behavioral disorders, a deficit-based model tends to emphasize underlying pathologies or problem behaviors in child and family systems, and primarily identify what the child cannot do rather than what they can do (Barnard, 1994; Epstein, 1999; Rudolph & Epstein, 2000). In early intervention, in which the goal is to avoid or ameliorate

the development of more significant behavioral and emotional problems, it is of particular importance to base educational and other intervention plans on comprehensive information of available child and family strengths (Guralnick & Neville, 1997; Provence, Erikson, Vater, & Palmeri, 1995). Strength-based assessment has been associated with significantly better functional outcomes than deficit-based assessments if the interventions also promoted strength-based service delivery practices (Cox, 2006). For instance, Cox demonstrated that when therapists were given information on children's behavioral strengths and believed that building on those strengths would enhance children's outcomes, there was an increase in targeted outcomes for the children served.

Because young children develop EBD in the context of a variety of multiple risk factors, including family, academic, interpersonal and intrapersonal factors, and assessment needs to account for multiple types of behavioral and emotional strengths in order to support effective intervention (Serna, Nielsen, Mattern, & Forness, 2002; Webster-Stratton & Hammond, 1997). Existing behavioral assessments for preschool children tend to rely on direct assessment of behavioral problems in children under controlled tasks, and emphasize particular behavioral constructs such as temperament, as in the *Children's Behavior Questionnaire* (Rothbart, Ahadi, Hershey, & Fisher, 2001) or the *Toddler Behavior Questionnaire* (Goldsmith, 1996). Some assessments such as the *Toddler Behavior Screening Inventory* (Mouton-Simien, McCain, & Kelley, 1997), the *Systematic Screening for Behavior Disorders* (Walker & Sevenson, 1990), the *Behavioral Assessment System for Children* (Reynolds & Kamphaus, 2004), the *Developmental Behavior Checklist* (Einfeld & Tonge, 1995), or the *Child Behavior Checklist* (Achenbach & Rescorla, 2000) can reliably discriminate typically developing children from those at risk for EBD and include some strengths such as adaptive behaviors, but rely on a deficit approach to identify problem behaviors rather than a full range of potential emotional and behavioral strengths. Social skills assessments such as the *Social Skills Rating System* (Gresham & Elliott, 1990), or deficit approaches that include adaptive behavior factors, only account for social skills of the child and do not account for other elements of the child's home or school environment that contribute to behavioral strengths. One behavioral assessment, the *Strengths and Difficulties Questionnaire* (Goodman, 1997, 2001), provides information on both strengths and deficits within children's behaviors but does not consider other risk factors that significantly affect a child's behavior such as family engagement.

### **Preschool Behavioral and Emotional Rating Scale (PreBERS) Development**

The *Preschool Behavioral and Emotional Rating Scale* (PreBERS) (Epstein & Synhorst, 2009) is a norm-referenced

standardized test, developed to assess the emotional and behavioral strengths of preschool children. The instrument consists of 42 items that are completed by preschool teachers and other adults who know the child. Preschool professionals or familiar people working with the child rate the 42 statements on a 0 to 3 Likert-type scale, based on how much the statement is like the child, and raw scores for each subscale are converted to a standard score. A Total Strength Index score is computed by summing the standard scores of the subscales and converting that sum into an overall strength standard score.

Four dimensions of emotional and behavioral strengths of preschoolers are measured by the PreBERS. The emotional regulation dimension includes 13 items that reflect a child's ability to appropriately manage his or her emotions in challenging situations (e.g., "shares with others," "accepts 'no' for an answer"). The school readiness dimension contains 13 items that represent key learning and language skills associated with school success (e.g., "follows multi-step directions"). The social confidence dimension has 9 items that reflect a child's appropriate initiation and response in social situations (e.g., "asks others to play"). The family involvement dimension contains 7 items that represent key environmental and family characteristics that support children's behavioral and emotional development (e.g., "maintains positive relations with family").

The content validity of the PreBERS was established following a rigorous test development process (see Epstein & Synhorst, 2009). First, a list of the 52 items from the original *Behavioral and Emotional Rating Scale* (Epstein, 2004; Epstein & Sharma, 1998), a strength-based measure for elementary and secondary school age children, was reviewed by approximately 150 preschool professionals who were asked to judge the appropriateness of each item for use with preschool children. Based on the feedback from the respondents, 21 original items were eliminated and no longer considered for inclusion in the PreBERS. Second, a comprehensive review was completed of the research on socialemotional development, risk and protective factors of preschool children, and childhood psychopathology. Several excellent sources provided relevant content (e.g., DelCarmen-Wiggins & Carter, 2004; National Research Council and Institute of Medicine, 2000; Zero to Three, 2005). Also, already published tests measuring the emotional and behavioral functioning of preschool children were examined for likely items relevant to the PreBERS focus. For example, the *Behavioral Assessment System for Children-2* (Reynolds & Kamphaus, 2004) was reviewed for content, format, and wording. From this search process, additional items ( $N = 39$ ) were included in the PreBERS prototype for a total of 70 possible items.

Next, a pilot study was conducted on a PreBERS prototype containing these 70 items to determine if each individual item could discriminate between children with

and without disabilities (Epstein & Synhorst, 2009). Several items ( $N = 8$ ) did not differentiate between the two groups of children and they were removed from the PreBERS prototype. Then, data on preschool children without disabilities ( $N = 239$ ) were collected from teachers who rated each student on the 62-item PreBERS prototype. An exploratory factor analysis was conducted on this sample and 5 additional items were deleted from the PreBERS prototype.

Finally, a nationally representative sample of children ( $N = 1,308$ ) was used to norm the PreBERS, with a prototype version containing 57 items. A principal-component factor analysis with a Promax solution was used to analyze the national data in this sample and led to the identification of four factors. Following the analysis, an additional 15 items were removed from the prototype PreBERS based on redundancy, overlap with other items, or failure to meaningfully contribute to a factor. The final version of the PreBERS used for the present study contained the 42 items resulting from this test development process, distributed among four factors.

Several aspects of the reliability of the final 42-item PreBERS have already been established for children with and without disabilities. The internal consistency, or internal reliability, was assessed during the norming process for the PreBERS (Epstein, Synhorst, Cress, & Allen, 2009); the Cronbach coefficients for each of the subscale and total strength scores were high and ranged between .84 and .98. Also, interrater and short-term test-retest reliability scores exceeded .80 for parent and professional respondents judging the PreBERS items for typically developing children (Epstein & Synhorst, 2009), demonstrating that the PreBERS is stable over a 1-month retest interval and consistent between raters for children without disabilities. Similar levels of test-retest reliability (correlations exceeding .80) and interrater reliability (correlations exceeding .70 for all four subscales) for the PreBERS have been demonstrated for teachers and paraprofessionals judging the behavior of children with disabilities (Cress, Epstein, & Synhorst, 2010).

### ***Purpose of the Present Research***

The purpose of the present research was to extend the research on the psychometrics of the PreBERS to children with disabilities. Although the four-factor PreBERS scale was based on a nationally representative sample of typically developing preschool children, using the scale with a different preschool population (i.e., preschool children with disabilities receiving special education services) could change the factor structure and psychometric properties of the instrument. Because the factor structure for the PreBERS was based on a sample of preschool children that did not differentiate children with and without disabilities, the structure of the scale based on ratings of children with disabilities remains unknown and may be very different from the original

findings. This is a limitation of many widely used preschool tests in that the psychometrics, and in this case the factor structures, are not assessed with the population for which the test will be used. Therefore, research is needed to determine if the original four-factor structure could be replicated with a sample of children with educational verification for disability services. Therefore, the purpose of this study was to replicate and confirm the original four-factor structure of the PreBERS with a national sample of preschool children receiving special education services in early childhood special education programs.

## **Method**

### ***Participants***

The Early Childhood Special Education sample (ECSE) included 1,103 children receiving early childhood special education services, ranging in age from 3–0 to 5–11 years. Data on these children were gathered between 2006 and 2007 in the following states: Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Missouri, Minnesota, Missouri, New Mexico, Pennsylvania, Tennessee, Utah, Virginia, Vermont, Wisconsin, and Wyoming. The selection procedures resulted in a national sample of preschool children educationally verified for services in Early Childhood Special Education programs. The purpose of this study was to demonstrate the appropriateness of the PreBERS fourfactor structure for assessing behavioral strengths in all children verified for early childhood special education services regardless of the type of delay or disability. No specific information was gathered on particular etiologies or types of disabilities represented by these children within the ECSE samples, because of the logistical barriers (e.g., parent consent, validating specific child diagnoses) to independently confirming children's diagnoses systematically in a large scale national sample such as this one.

The characteristics of the sample with regard to geographical area, gender, race, ethnicity, and age are reported as percentages in Table 1. The percentages for these characteristics were compared in Table 1 with data on special education programs nationwide (National Center for Special Education Research, 2007; U.S. Department of Education, 2004). The comparison of the percentages indicates that for the most part the sample was representative of preschool children in ECSE programs nationwide with respect to gender, race, and ethnicity status. However, it was not representative of the population in terms of geographical region and age. The sample was overrepresented with children from the Midwest and three year olds, and underrepresented with children from the West and underrepresented with 5-year-olds.



**Table 1.** Demographic Characteristics of the PreBERS Early Childhood Special Education Norming Sample ( $N = 1103$ )

Characteristics	Percentage of Sample	Percentage of U.S. ECSE Population <sup>a</sup>
<b>Geographic area</b>		
Northeast	20	24
South	29	26
Midwest	46	26
West	5	24
<b>Gender</b>		
Male	70	70
Female	30	30
<b>Spanish/Hispanic</b>		
Yes	11	14
No	89	86
<b>Ethnicity</b>		
White	69	67
Black/African American	14	15
Other	17	18
<b>Age</b>		
3 ( $n = 452$ )	32	22
4 ( $n = 581$ )	44	38
5 ( $n = 438$ )	24	40

a. Percentages of US early childhood special education (ECSE) populations are derived from data in the following reports: National Center for Special Education Research (2007) and U.S. Department of Education (2004).

## Procedures

**Data collection.** Directors of ECSE programs in local education districts from around the United States were contacted via e-mail and asked to be coordinators. Those who agreed to participate were mailed detailed instructions in the administration procedures of the PreBERS. They were also given instructions on how to recruit preschool teachers and train them in how to complete the PreBERS form. The coordinators and teachers who volunteered to participate served as a convenience sample, as did the children rated by their teachers on the PreBERS. Coordinators and teachers provided written consent before they participated.

Preschool teachers who agreed to participate were asked to score the PreBERS for all the children in their classrooms, providing a complete sample of all children with educationally verified delays and disabilities served by ECSE through that teacher in that educational district. Because teachers reported on complete samples of children in their classrooms, and these children reflect the diversity (gender and ethnic/racial) expected for a national special education population, it is also expected that the children scored through this sampling method reflect a representative sample of the range of disabilities and severities served by ECSE across the national geographic regions sampled. Rater effects for multiple samples from the same teachers have already

been demonstrated to be minimal in other research on teachers completing the PreBERS; intercorrelation coefficients for test-retest reliability samples of teachers rating their children with disabilities were at or below recommended levels of .3 (Cress et al., 2010).

**Instrument.** The PreBERS (Epstein & Synhorst, 2009) is a 42-item rating scale that assesses four areas of emotional and behavioral strengths in preschool children (i.e., emotional regulation, school readiness, social confidence, and family involvement). A preschool teacher or other adult familiar with the child rates each item on a Likert-type scale (0 = *not much like the child* to 3 = *very much like the child*). Scoring of the PreBERS for a single child takes approximately 10 minutes. Standard scores are calculated for each of the four subscales ( $M = 10$ ,  $SD = 3$ ). The sum of the subscale standard scores is converted into a Strength Index that has a mean of 100 and a standard deviation of 15.

The standard scores for the subscales on the PreBERS were developed using a continuous norming procedure that uses polynomial regression to fit the progression of the means, standard deviations, skewness, and kurtosis for typically developing males and females. The shape of the distribution of scores was determined using the fitted values of skewness and kurtosis from the regression. The composite Strength Index was calculated using Guilford and Fruchter's (1978) procedure for pooling variance, which pools the standard scores of the subscales that make up the composite. Additional details on the PreBERS norming procedures can be found in the manual (see Epstein & Synhorst, 2009).

**Design and data analysis.** AMOS 4.0 (Arbuckle, 1999) was used to conduct confirmatory factor analyses (CFAs) to compare the extent to which the ECSE data fit the four-factor PreBERS structure that was established in the norming of the PreBERS (Epstein & Synhorst, 2009). The four-factor model proved to be robust in the norming of the instrument and the exact items from the PreBERS used for norming were included in the present study, so no exploratory analyses were conducted. The participants' standard scores on the subscales were used as indicators. All parameter estimates were performed using covariance matrices and maximum-likelihood estimation to test the fit of the PreBERS subscale assignment to the PreBERS Strength Index. Following the CFA, zero-order correlations were calculated to determine the relations between the factors.

In testing this model, four indexes of model fit were computed: Bentler's (1990) comparative fit index (CFI), Tucker and Lewis's (1973) index of fit (TLI), and Bentler and Bonett's (1980) normed fit index (NFI) and Browne and Cudek's (1993) root mean square error of approximation (RMSEA). These indices assess different aspects of model fit and have varying criteria for a model demonstrating good fit. Recent methodological research indicated that the CFI, TLI, and NFI values should be at or

**Table 2.** Zero-Order Correlations of the PreBERS Subscales for the ECSE Sample

Subscale	School Readiness	Social Confidence	Family Involvement
Emotional regulation	.67	.71	.71
School readiness	—	.75	.63
Social confidence		—	.71

above .90 to indicate a good fitting model (Hu & Bentler, 1999), with values close to 1 indicating a very good fit on any of these indexes. An RMSEA of less than .10 indicates a reasonable fit, and an RMSEA of about .08 or less indicates a close fit of the model in relationship to the degrees of freedom (Browne & Cudek, 1993).

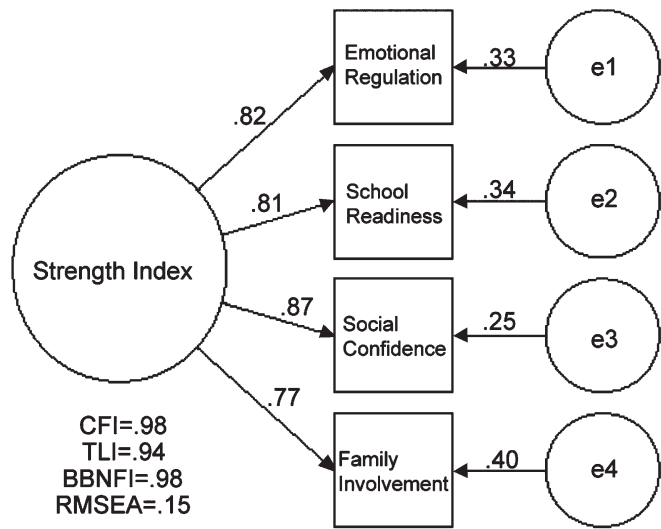
**Results**

The zero-order correlations of the PreBERS subscales with the ECSE sample are presented in Table 2. All of the coefficients in the tables were statistically significant beyond the .01 level. The coefficients ranged from .63 to .75; the mean of the six coefficients was .70. According to Hopkins (2002), coefficients for the subscales and the median coefficient fell within the large to very large range. The results of the CFA for the proposed model are presented in Figure 1. The figure illustrates the factor representing the PreBERS Strength Index as a circle. The values on the arrows between the factor and the subscales, which are represented by squares, are factor loadings. The standardized factor loadings are regression coefficients that represent the influence of the factor—the PreBERS Strength Index—on the subscale. The values on the arrows pointing from e1 through e4 to the subscales represent error variance. Error variance consists of random error and may also include unique systematic error that is unrelated to the variances of the other subscales.

The factor loadings associated with all subscales are in the large to very large range, according to Hopkins’s (2002) criteria, and significantly different from zero. For the ECSE sample, the subscales are in the large range (>.60, for the Family Involvement subscale) to very large range (>.80 for the remaining three subscales). The Kaiser–Meyer–Olkin measure of sampling adequacy was .973, and Bartlett’s test of sphericity resulted in a chi-square of 39,106.30, degrees of freedom 861.

For the ECSE sample, three of the four confirmatory factor indices supported the fit of the four-factor model to the data, with the CFI equal to .98, the TLI equal to .94, and the NFI equal to .98. The RMSEA was equal to .15, which slightly exceeds the recommended range of .10 or less for reasonable fit. The structure matrix for the

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**Figure 1.** Subscale factor loadings for PreBERS Early Childhood Special Education sample.

four factors on each of the PreBERS items is provided in Table 3 for the 42 items of the PreBERS, with items from the original 53-item assessment that did not contribute to factor loadings removed.

**Discussion**

*Discussion of Research Questions*

The results of the CFA indicate that the formation of the PreBERS Strength Index based on four factors is supported by the data for the ECSE samples. Three of the four indexes (the CFI, the TLI, and the NFI) supported the fit of the model to the data within the established optimum range of fit. The RMSEA reflects cumulative error and tends to favor more complicated models, which may explain why this index was a little higher than the optimum range of .10 or lower. Also, all of the subscale factor loadings were large to very large and significantly different from zero.

All the zero-order correlations were significant and also fell within a large to very large range. These data compare quite favorably to the correlation coefficients reported for the normative preschool sample that ranged between .66 and .77, with a mean of .71. If the PreBERS subscales all measure some aspect of behavioral and emotional strength, they should be significantly intercorrelated, but not too highly. Correlations that are too high indicate that those subscales do not contribute significant *unique* variance to the overall construct being measured, and thus are redundant with each other. The findings indicate that the PreBERS subscales measure different aspects of behavioral and emo-

**Table 3.** Structure Matrix for Each Item on the PreBERS by the Four Factors in the Model

Factor	Emotional Regulation	School Readiness	Social Confidence	Family Involvement
<b>Emotional regulation items</b>				
Item 10: Controls anger toward others	0.84	0.45	0.39	0.52
Item 12: Expresses remorse of behavior that hurts others	0.72	0.46	0.66	0.48
Item 13: Shows concern for feelings of others	0.77	0.48	0.67	0.56
Item 16: Reacts to disappointments calmly	0.83	0.46	0.45	0.44
Item 19: Handles frustration with challenging tasks	0.78	0.64	0.52	0.41
Item 21: Takes turns in play situations	0.84	0.66	0.49	0.60
Item 28: Accepts responsibility for own actions	0.87	0.57	0.60	0.53
Item 30: Loses a game gracefully	0.83	0.49	0.42	0.44
Item 37: Accepts "no" for an answer	0.86	0.52	0.44	0.52
Item 43: Respects rights of others	0.86	0.55	0.51	0.61
Item 44: Shares with others	0.87	0.58	0.48	0.62
Item 46: Apologizes to others when wrong	0.79	0.49	0.62	0.51
Item 49: Is kind toward others	0.82	0.46	0.49	0.68
<b>School readiness items</b>				
Item 4: Understands meaning of words similar to peers	0.39	0.81	0.52	0.42
Item 11: Carries on conversations	0.45	0.78	0.68	0.42
Item 17: Persists with tasks until completed	0.72	0.73	0.49	0.48
Item 20: Demonstrates age-appropriate hygiene	0.58	0.62	0.46	0.67
Item 32: Understands complex sentences	0.49	0.88	0.50	0.42
Item 33: Listens to conversation of others	0.57	0.78	0.60	0.51
Item 39: Pays attention to tasks	0.72	0.80	0.46	0.59
Item 40: Listens attentively when stories are read	0.62	0.76	0.44	0.53
Item 41: Follows multi-step directions	0.61	0.81	0.41	0.48
Item 47: Retells stories or recent events	0.50	0.78	0.63	0.33
Item 50: Uses details in talking with others	0.50	0.82	0.65	0.38
Item 54: Works independently	0.66	0.71	0.39	0.53
Item 55: Uses numbers/color words correctly	0.50	0.79	0.40	0.44
<b>Social confidence items</b>				
Item 5: Is self-confident	0.42	0.65	0.69	0.53
Item 6: Acknowledges painful feelings	0.45	0.46	0.76	0.51
Item 9: Asks for help	0.47	0.46	0.79	0.46
Item 18: Stands up for self	0.29	0.54	0.62	0.22
Item 25: Accepts closeness/intimacy of others	0.60	0.42	0.76	0.59
Item 26: Identifies own feelings	0.59	0.57	0.78	0.48
Item 27: Makes friends	0.67	0.57	0.70	0.66
Item 31: Asks other to play	0.62	0.59	0.70	0.43
Item 42: Is enthusiastic about life	0.53	0.55	0.70	0.63
<b>Family involvement items</b>				
Item 1: Sense of belonging to family	0.47	0.39	0.42	0.84
Item 2: Trusts significant person	0.43	0.41	0.41	0.82
Item 7: Maintains positive family relationships	0.55	0.43	0.50	0.83
Item 15: Interacts positively with parents	0.61	0.40	0.46	0.80
Item 23: Is involved in family discussions	0.65	0.66	0.60	0.72
Item 29: Interacts positively with siblings	0.70	0.46	0.46	0.65
Item 36: Participates in family activities	0.55	0.51	0.51	0.82

tional strength and provide convincing evidence for construct identification validity of the PreBERS. Therefore, we can conclude that the four-factor structure of the PreBERS demonstrated an acceptable fit with the

ECSE sample and that the PreBERS Strength Index can be considered a valid underlying influence on the four PreBERS subscales for all samples of children receiving special education services.

These results indicate that the four strength factors of the PreBERS (emotional regulation, social confidence, school readiness, family involvement) can form an effective model for the construct of behavioral and emotional strength in preschool children with disabilities. This four-factor model provides broader information about factors that affect behavioral and emotional development than other assessments used with children who have disabilities, and is consistent with the four-factor models from school-aged children and children without disabilities (Epstein, 2004; Epstein et al., 2009). Other research has reported effective assessment in children with disabilities for some of the subscale constructs in the PreBERS, such as temperament (emotional regulation) (Bradley & Corwyn, 2008) or family involvement (Belsky et al., 2007). The representation of strength factors internal to the child (emotional regulation) or the interaction between child and tasks (school readiness) as well as between the child and family (family involvement) or child and interaction partners (social competence) make the PreBERS a very valuable and broadbased representation of behavioral and emotional skills from which intervention and educational planning for children with disabilities can be developed.

### *Limitations and Future Directions*

Several limitations of the present study should be noted. First, although the sample was large, ethnically and racially diverse, and national in scope, it was a convenience sample of volunteer informants, and the nature of the sample may have influenced results. Although large in scope, the national sample was not representative of children in ECSE programs with respect to geography and region. Future researchers should test the factors of the PreBERS with a more broad, geographically representative sample. The study's results should be replicated with other preschool children and informants to determine that the results are not unique to this study's sample. Moreover, the disabilities or delays of the children in the present sample were not identified, because of difficulty confirming educational verifications of children collected in a national sample, as well as the difficulty diagnosing specific disabilities in preschool children who may not yet have an identified etiology beyond developmental or language delay. Large samples of children diagnosed with specific disabilities, particularly those at risk for learning disabilities (LD) and emotional disturbance (ED), were not included in the present study and these disabilities are not typically diagnosed at the target preschool ages. Children with LD and ED may present very different behavioral and emotional strengths from the general population, which could influence the factor structure of the scale. Results should be replicated with a sample of pre-

school children with known delays that indicate risk for future diagnosis of LD and ED, to determine if a different factor structure emerges.

Second, there are limitations of the extent of the CFA. For example, factor invariance was not examined for subsamples such as gender or ethnicity. In addition, no CFA tested second-order factors underlying the four-factor structure to confirm the utility of the strength index. Further research is warranted evaluating demographic variables that may influence the four-factor structure underlying the PreBERS. Although three of the fit estimates suggested that the four-factor model was a good fit for the data, the RMSEA did not reflect this. Further studies are necessary to replicate these fit estimates, and evaluate the multidimensional contribution of each of the factors and their interactions to the Strength Index.

As with all new assessment instruments, more research needs to be conducted on the psychometric properties of the PreBERS. For example, criterion validity research should be done with other parent-reported instruments of child and family functioning as well as other preschool instruments of child behavioral functioning. The PreBERS could also be used in longitudinal studies to examine the stability of parent and teacher ratings for longer periods than the 1-month test-retest reliability already reported (Cress et al., 2010). Further interrater reliability is needed to directly compare the ratings of teachers and parents of preschool children with disabilities.

The development of the PreBERS and the confirmation of the four-factor structure with a sample of parents of children with educational verification of disabilities represent important advancements in strength-based instruments. Although further research is needed with the PreBERS, the assessment possesses a logical four-factor structure and has national norms for children with disabilities (present study) and nationally representative norms for typically developing children (Epstein & Synhorst, 2009). Combined with other research that confirms the efficacy of the PreBERS at discriminating children with disabilities from typically developing children (Epstein & Synhorst, 2009), the PreBERS can be confidently used by professionals to characterize children's behavioral and emotional strengths, both for children with identified disabilities and those with suspected risk for language and/or emotional disabilities.

It is particularly important to test factor loadings for an assessment such as the PreBERS on children with disabilities, as well as typically developing children. The groups of children for whom behavioral strengths are most important to identify are those children at risk for behavioral problems or those children who already have identified disabilities. A behavioral assessment must accurately represent the types of behavior strengths demonstrated in children with disabilities, as the types of



strengths demonstrated in this population could potentially differ from children without identified disabilities. Confirming the four-factor structure of the PreBERS for children with disabilities justifies the use of the four categories of behavioral strength (i.e., emotional regulation, school readiness, social confidence, and family involvement) in behavioral assessments with children who have disabilities.

### *Clinical and Educational Implications*

Implications for educational and clinical practitioners who use the PreBERS include a greater breadth and depth of behavioral strengths that can be accurately assessed and incorporated in responding to behavioral concerns in preschool children. Although it may be possible to tailor interventions to directly enhance specific areas of strength in a child's environment, one research-based application of the behavioral strength information such as that obtained from the PreBERS would be to provide information on child strengths from this assessment to practitioners, and justify the relationship of those strengths to child outcomes for the practitioners. Evidence suggests that if practitioners are convinced of the associations between child strengths and behavioral outcomes, this can lead to improved outcomes in therapeutic outcomes for the child without specific targeted interventions based on those strengths (Cox, 2006).

The strength-based nature of the PreBERS provides a clear and accurate picture of a child's behaviors that can be used to plan educational and other therapeutic interventions. By reporting multifaceted skills that the child demonstrates, across a variety of informants and contexts, practitioners can build an educational plan to maximize the child's strengths and enhance or compensate for areas of relative difficulty. By reporting family and other interpersonal factors as well as internal child factors in the PreBERS, the intervention can also build on external factors affecting the child's behavior by building strengths within the child's context and experiences as well as personal qualities and responses to events. The PreBERS provides a concise and powerful means to gather and track essential information about children's behavioral and emotional strengths to support long-term gains in educational interventions.

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### **References**

- Achenbach, T. M., & Rescorla, L. (2000). *Manual for the ASEBA Preschool Forms and Profiles*. Burlington: University of Vermont.
- Arbuckle, J. L. (1999). *AMOS user's guide version 4.0*. Chicago, IL: Small Waters Corporation.
- Ashford, J., Smit, F., van Lier, P. A. C., Cuijpers, P., & Koot, H. M. (2008). Early risk indicators of internalizing problems in late childhood: A 9-year longitudinal study. *Journal of Child Psychology and Psychiatry*, *49*, 774–780.
- Barnard, C. P. (1994). Resiliency: A shift in our perception? *American Journal of Family Therapy*, *22*, 1354–144.
- Belsky, J., Fearon, R. M. P., & Bell, B. (2007). Parenting, attention and externalizing problems: Testing mediation longitudinally, repeatedly, and reciprocally. *Journal of Child Psychology and Psychiatry*, *48*, 1233–1242.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238–246.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*, 588–606.
- Bradley, R. H., & Corwyn, R. F. (2008). Infant temperament, parenting, and externalizing behavior in first grade: A test of the differential susceptibility hypothesis. *Journal of Child Psychology and Psychiatry*, *49*, 124–131.
- Browne, M. W., & Cudek, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445–455). Newbury Park, CA: Sage.
- Cox, K. F. (2006). Investigating the impact of strength-based assessment on youth with emotional or behavioral disorders. *Journal of Child and Family Studies*, *15*, 287–301.
- Cress, C. J., Epstein, M.H., & Synhorst, L. (2010). Preschool Behavioral and Emotional Rating Scale (PreBERS): Test-retest and inter-rater reliability for children with disabilities. *Exceptionality*, *18*, 58–69.
- DelCarmen-Wiggins, R., & Carter, A. (Eds.). (2004). *Handbook of infant, toddler, and preschool mental health assessment*. Oxford: Oxford University Press.
- Einfeld, S. L., & Tonge, B. J. (1995). The Developmental Behavior Checklist: The development and validation of an instrument to assess behavioral and emotional disturbance in children and adolescents with mental retardation. *Journal of Autism & Developmental Disabilities*, *25*, 81–104.
- Epstein, M. H. (1999). The development and validation of a scale to assess the emotional and behavioral strengths of children and adolescents. *Remedial and Special Education*, *20*, 258–262.
- Epstein, M. H. (2004). *Behavioral and Emotional Rating Scale, 2nd edition: A strengths-based approach to assessment*. Austin, TX: Pro-Ed.
- Epstein, M. H., & Sharma, J. (1998). *Behavioral and Emotional Rating Scale: A strengths-based approach to assessment*. Austin, TX: Pro-Ed.

- Epstein, M. H., & Synhorst, L. (2009). *Preschool Behavioral and Emotional Rating Scale (PreBERS): A strengths-based approach to assessment*. Austin, TX: Pro-Ed.
- Epstein, M. H., Synhorst, L., Cress, C. J., & Allen, E. (2009). Development and standardization of a test to measure the emotional and behavioral strengths of preschool children. *Journal of Emotional and Behavioral Disorders, 17*, 29-37.
- Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development, 67*, 218-235.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 38*, 581-586.
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire. *Journal of the Academy of Child and Adolescent Psychiatry, 40*, 1337-1345.
- Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system*. Circle Pines, MN: American Guidance Service.
- Guilford, J. P., & Fruchter, B. (1978). *Fundamental statistics in psychology and education*. New York: McGraw-Hill.
- Guralnick, M. J., & Neville, B. (1997). Designing early intervention programs to promote children's social competence. In M. J. Guralnick (Ed.), *The effectiveness of early intervention*. Baltimore: Paul H. Brookes.
- Hopkins, W. G. (2002). A scale of magnitudes for effect statistics. Retrieved from <http://www.sportsci.org/resource/stats/effectmag.html>
- Hu, E., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.
- Mouton-Simien, P., McCain, A. P., & Kelley, M. L. (1997). The development of the Toddler Behavior Screening Inventory. *Journal of Abnormal Child Psychology, 25*, 59-64.
- National Center for Special Education Research. (2007). Data tables. Retrieved from <https://www.peels.org/default.asp>
- National Research Council and Institute of Medicine. (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press
- Provence, S., Erikson, J., Vater, S., & Palmeri, S. (1995). *Infant-toddler development assessment (IDA)*. Chicago: Riverside Publishing.
- Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior Assessment System for Children, 2nd ed. (BASC-2)*. San Antonio, TX: PsychCorp.
- Rothbart, M. K., Ahadi, S. A., Hershey, K., & Fisher, P. (2001). Investigations of temperament at three to seven years: The Children's Behavior Questionnaire. *Child Development, 72*, 1394-1408.
- Rudolph, S. M., & Epstein, M. H. (2000). Empowering children and families through strength-based assessment. *Reclaiming Children and Youth, 8*, 207-209.
- Serna, L., Nielsen, E., Mattern, N., & Forness, S. R. (2002). Use of different measures to identify preschoolers at-risk for emotional or behavioral disorders: Impact on gender and ethnicity. *Education and Treatment of Children, 25*, 415-437.
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*, 1-10.
- U.S. Department of Education. (2004). 26th Annual Report to Congress on the Implementation of the Individuals with Disabilities Act, 2004. Washington, DC: Author.
- Walker, H. M., & Severson, H. H. (1990). *Systematic screening for behavior disorders (2nd ed.)*. Longmont, CO: Sopris West.
- Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology, 65*, 93-109.
- Zero to Three. (2005). *Diagnostic classification of mental health and developmental disorders in infancy and early childhood (Rev. ed.)*. Washington, DC: Zero to Three Press.