

# FACTOR ANALYSIS OF TEACHER RATINGS FOR THE LITHUANIAN TRANSLATED BEHAVIORAL AND EMOTIONAL RATING SCALE

*Matthew C. Lambert, Philip D. Nordness, Michael H. Epstein,  
University of Nebraska at Omaha, USA  
Renata Geležinienė,  
Siauliai University, Lithuania*

## **Abstract**

Internationally there has been increased recognition of the value of strength based assessment in educational and mental health service delivery. While there are a number of informal methods for determining a child's strengths and assets, there are few standardized strength based assessments available for international use. In this study the teacher version of the Behavioral and Emotional Rating Scale-Second Edition (BERS-2) was translated into Lithuanian to determine its factor structure for use in Lithuania. The results suggest that the Lithuanian BERS-2 can be a useful strength based assessment for teachers and schools in Lithuania.

**Key words:** *strength-based assessment, assessment, Lithuania, education, behavior*

When the purpose of an evaluation or assessment is to make decisions regarding eligibility for special services or to design educational or therapeutic intervention plans, it is essential to consider the behavioral and emotional strengths, assets, and resources a child possesses so that decisions can be made accurately and interventions can be designed accordingly. However, according to a recent study on the assessment practices of children with special needs in Europe, assessment and evaluation of children's strengths is clearly lacking in traditional psychometric tests (Lebeer et al., 2011). While the assessment of behavioral and academic deficits is an essential part of the assessment process for children who may require special education or mental health services, there is a potential problem that an over emphasis on deficits may ignore potential strengths, competencies, and skills that an individual may possess.

In a strength-based approach to assessment, practitioners measure a range of behavioral and emotional skills, competencies, and characteristics that contribute to a child's potential for success in school, peer, and family relationships (Epstein, 2004). Identifying the particular set of skills, competencies, and resources that a child possesses may be more important to recognize than the amount of deficits or lack of ability (Meisels, 1994) as a child's strengths are the foundation upon which interventions should be developed. Furthermore, approaches to identifying a child's strengths and assets is significant as they can influence a child's interactions with parents, peers, and teachers, which can in turn impact the child's social and emotional development (Brofenbrenner, 1979).

Assessing and evaluating the strengths and assets within an individual is an important part of the assessment process for designing, implementing, and evaluating interventions for children. For instance, strength-based measures can be used to assist in intervention planning by identifying skills and resources a child may possess so that they can identify areas for potential growth and improve deficit areas. In addition, strength-based assessments can be used to monitor individual student progress on interventions to determine their effectiveness over time and to evaluate school-wide program outcomes (Buckley & Epstein, 2004; Epstein et al., 2003; Trout et al., 2003). Furthermore, an increased emphasis on the strengths and areas of potential growth for an individual can lead to increased rapport and improved communication between students, parents, and school personnel (Buckley & Epstein, 2004; Cox, 2006; Epstein, 2004). These improved relationships can lead to increased motivation to provide services to the child (Rhee et al., 2001), and improve the well-being of family members (Epstein et al., 2002).

The value of strength-based assessment has been increasingly recognized internationally as an essential part of the assessment process (e.g., Lappalainen et al., 2009; Obel et al., 2004; Rothenberger & Woerner, 2004). In Europe special education programs have been moving away from deficit-based assessments to more positive, interactive approaches that considers student strengths and potential areas for growth. In addition, European communities have recognized that strength based assessments can be useful for academic and behavioral intervention planning, and enhance the potential for students with disabilities to be educated in general education settings (Watkins, 2007). In Finland, strength-based assessment has been emphasized to such a degree that the Finnish Ministry of Education (2007), the Law of Basic Education (Finnish Law 642/2010), and National Curriculum Guidelines (Finnish National Board of Education 2010) have mandated that decisions regarding student placement in special education or other support services recognize the strengths of individual students as well as their difficulties. Similarly in Lithuania, the Ministry of Education and Science approved a policy entitled, *The Concept of Assessment of Pupils' Achievement and Progress* (approved by the Minister of Education and Science in 2004-02-25, the Law No 256), which was developed to outline strategies for assessment and to identify key elements in the assessment process. Among the key elements of this policy was that assessments should encourage student motivation by emphasizing strengths and achievement rather than failure. This increasing trend towards a more strength-based approach to educational and therapeutic service delivery in Scandinavia and Europe has led to the need for standardized, psychometrically sound assessments that measure individual strengths in their native language.

While there are a number of informal methods for assessing the strengths and abilities of individual students, there are few standardized strength based measures for individual and school-wide assessment. A standardized strength based assessment is useful because it can be completed in a timely manner, allows for comparison across individuals and groups, and it can be used as part of a comprehensive assessment package to determine eligibility for special programming. In addition, standardized strength based assessments can be used to identify areas of limited strength so that interventions can be designed to improve those social and emotional areas of concern.

One of the most widely used strength-based assessment instruments in education and mental health service delivery in the United States is the Behavioral and Emotional Rating Scale-2 (BERS-2; Epstein, 2004; Epstein & Sharma, 1998). The BERS-2 is a standardized, norm-referenced assessment that measures the strengths of children 5 to 18 years of age and includes separate rating scales for youth, parent, and teacher (Epstein, 2004). The three rating scales are similar but contain minor wording alternations in some items to reflect the perspective of the respondent. The BERS-2 contains 52-items which factor into five subscales

of emotional and behavioral strengths and an overall strength index. The interpersonal strength subscale consists of 14 items that measure a child's ability to interact with others in social situations (e.g., Uses anger management skills). The family involvement subscale includes 10 items that assess a child's relationship with their family (e.g., Maintains positive family relationships). The intrapersonal strength subscale includes 11 items that focus on how a child perceives his or her own functioning (e.g., Demonstrates sense of humor). The school functioning subscale includes 9 items that assess a child's performance and competence in school (e.g., Completes school tasks on time). The affective strength subscale includes 7 items that measure a child's ability to give affection to and receive affection from others (e.g., Accepts a hug). The scale can be completed in approximately 10 minutes and also includes eight open-ended questions that allow respondents to note the individual's specific academic, social, athletic, family, and community strengths. Numerous studies have been conducted to demonstrate the factor structure, reliability and validity of the BERS-2 (Epstein, 2004).

To address the need for standardized strength-based assessments in Europe, the BERS-2 has been translated into other languages. In previous research the BERS-2 was translated into Finnish and its psychometric properties investigated. In those studies the BERS-2 demonstrated adequate factor structure, convergent validity and reliability (Sointu et al., 2012a; Savolainen et al., 2013). In Lithuania there has been increasing recognition of the value of strength-based assessment to assist in teaching and learning and to identify potential areas of growth for students. In the present study the BERS-2 was translated into Lithuanian and its psychometric properties were investigated. In spite of the research on the psychometric properties of the BERS-2, when assessments are translated from one language to another language or used in another country or culture, the psychometric properties must be re-established for that particular country or language (American Psychological Association & National Council on Measurement in Education, 1999; International Test Commission, 2010). The purpose of this study was to provide initial evidence of the internal structure of the Lithuanian-translated BERS-2. To this end, we fit three confirmatory factor analysis models to test the internal structure of the assessment and computed the reliability of each subscale and total score.

## **Method**

### *Participants*

Participants included 79 teachers who rated 334 students from 19 schools throughout Lithuania. Students ranged in age from 11 to 17 years with a mean age of 13.74 ( $sd = 1.45$ ). The sample was roughly split on gender with 53% female participants ( $n = 181$ ). All of the students identified as being ethnically Lithuanian. Nearly one-quarter of the students ( $n = 76$ ) were identified by their teacher as receiving extra support services for learning or behavioral difficulties. All of the teachers were considered general education teachers, most having at least 20 years of teaching experience ( $m = 20.8$ ,  $sd = 8.62$ ).

### *Procedure*

Permission for translating the BERS-2 was obtained from the publisher PRO-ED and the author of the instrument. The BERS-2 teacher rating scales was translated into Lithuanian using the back-forward translation in the following manner. First, an expert in Lithuanian language and culture translated the rating scales. Second, the expert shared the translated rating scales with colleagues and bilingual experts in Lithuanian language to assess reliability. At this stage a few edits were made and consensus was reached. Third, we asked a second expert in Lithuanian language to translate the rating scales back into English to confirm the translation. Finally, we sent the translated rating scales to colleagues in Lithuania for their review. This resulted in a few additional minor edits that became the finalized versions of the BERS-2 Lithuanian rating scales.

Data were collected in the Spring of 2014. Schools that collaborate with Siauliai University were contacted in person and by e-mail asking if they would be willing to participate in a study to examine the psychometrics of a standardized strength based assessment instrument that had been translated into Lithuanian. Once a school administrator agreed to participate, a letter describing the project, what was required of the teachers, and what the value of the research was to the schools and Lithuanian community was placed in the mailbox of the teachers. Teachers were then contacted in person and via e-mail to determine their willingness to participate in the study.

For data collection, one of the researchers delivered the translated BERS-2 teacher rating scale to the schools as well as the instructions for completing the scales. Teachers who had volunteered to participate in the study were provided with the number of questionnaires that they had volunteered to complete. The teachers completed the BERS-2 on students they had been familiar with for at least 3 months. To select which students they would rate, the teachers randomly chose the students from their class list. However, there were a few teachers who chose to complete the BERS-2 on their whole class, in which case there was no random selection. Included in the instructions was the requirement that the teachers not include any student names or personal information that could be used to identify the students. The teachers were given two weeks to complete the questionnaires. At the conclusion of two weeks, representatives from Siauliai University picked up the completed questionnaires, which had been placed in a marked envelope. This resulted in 334 completed BERS-2 teacher rating scales.

#### *Measure*

The *Behavioral and Emotional Rating Scale* (BERS-2) is a 52-item assessment used to evaluate the behavioral and emotional strengths of youth. Each item is measured on a four-point Likert-type scale (0 = not at all like the student; 1 = not much like the student; 2 = somewhat like the student; 3 = very much like the student). Some example items include: 'completes a task on first request', 'shares with others', and 'pays attention in class'. The items form five subscales: (1) interpersonal strengths, (2) intrapersonal strengths, (3) affective strengths, (4) family involvement, and (5) school functioning. The subscale scores are combined to form the overall Strength Index. Teacher ratings were evaluated in this study.

#### *Data Analysis Plan*

SPSS v21 and Mplus v7.11 (Muthén & Muthén, 1998-2014) were used to compute descriptive statistics and fit confirmatory factor analysis (CFA) models, respectively. The focus of the factor analysis was to examine the fit of the theoretical five-factor model. As a basis for comparison, two alternative models were also fit: (1) single-factor model, and (2) second-order model<sup>1</sup>. Both models were specified without correlated residual variances between items. Because items were measured on a 4-point Likert-type scale, we treated the ratings as ordinal rather than continuous indicators of the latent factors. Accordingly, we used weighted least squares with mean and variance adjustments (WLSMV; robust WLS) to estimate each model and the factors were scaled using a fixed mean and variance approach. Missing data for the CFA models were minimal (< 1%) and excluded from the analysis by using a pairwise-present method as is default in Mplus when using the WLSMV estimator.

The indicators used to assess goodness-of-fit were the comparative fit index (CFI; Bentler 1990), Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA; Steiger & Lind, 1980) at its 90% confidence interval. CFI and TLI are comparative fit indexes representing the degree of improvement over the worst fitting model (Boomsma, 2000). Both indexes are scaled from 0 to 1 with values closer to 1 indicating better fit.

A *close* fitting model has CFI and TLI values  $\geq 0.95$  while an *acceptable* fitting model has a CFI/TLI  $\geq 0.90$  (Browne and Cudeck 1993). RMSEA represents the degree of model misfit and is reported on a scale of 0 to 1; values closer to zero indicate better fit with values  $\leq .05$  considered to represent close fit and values  $\leq .08$  considered acceptable (Hu & Bentler, 1999); in addition to examining the point estimate, the 90% confidence interval was also used to evaluate misfit with the upper limit less than .05 representing close fit and .08 representing acceptable fit. The chi-square difference test ( $\Delta\chi^2$ ) and CFI differences ( $\Delta\text{CFI}$ ) were computed to evaluate the fit of nested models (e.g., the one-factor versus the two-factor model). A non-significant  $\Delta\chi^2$  test or a difference in CFI less than .01 indicates that the fit of the two models being compared are statistically equivalent (Cheung & Rensvold, 2002).

To aid in the interpretation of the second-order factor model, a Schmid-Leiman transformation (Schmid & Leiman, 1957) was conducted to yield estimates of *loadings between items and the second-order factor* and the *residualized loadings* between items and the primary factors (i.e., factor loadings when controlling for the influence of the second-order factor). This transformation provides a method to disentangle the effects that the first and second-order factors exert on the item responses (Brown, 2006). Schmid-Leiman transformed factor loadings are interpreted according to the same magnitude guidelines as primary first-order factor loadings where loadings  $> .30$  are considered of substantive importance. Residualized primary factor loadings smaller than .30 indicate that the majority of variance of the item responses is associated with the more general second-order factor, and that the primary factor contributes limited influence on the item responses (Campbell-Sills et al., 2004).

### Results

Table 1 reports the goodness-of-fit indicators for the three CFA models. All models converged on admissible solutions and exhibited large ( $> .40$ ), positive factor loadings. The single factor model did not exhibit acceptable fit. The hypothetical five-factor model demonstrated acceptable albeit not close fit (CFI  $\geq .90$ , TLI  $\geq .90$ , RMSEA  $\leq .08$ ) and a significant improvement over the single-factor model ( $\Delta\chi^2_{(10)} = 407.87$ ,  $p < .001$ ;  $\Delta\text{CFI} = .051$ ). The five latent factors were highly correlated, ranging from .65 (school functioning with affective strengths) to .90 (intrapersonal strengths with affective strengths).

**Table 1.** CFA Model Fit Indexes

	<i>df</i>	CFI	TLI	RMSEA [90% CI]	$\Delta\chi^2$ ( <i>df</i> )
Single-factor model	1274	.880	.875	0.077 [.074, .079]	–
Five-factor model	1264	.931	.928	0.058 [.055, .061]	407.87 (10)*
Second-order model	1269	.929	.925	0.059 [.056, .062]	49.29 (5)*

See Table 2 for correlations between latent factors. These correlations, which ranged from .82 to .95, are largely in line with previous research on the BERS-2 in North America (Buckley, Ryser et al., 2006; Epstein, 2004) and Europe (Lappilainen et al., 2009; Sointu et al., 2014). The factor solution of the current study was nearly identical to the factor solutions presented in the literature for samples drawn from the US (Epstein, Ryser et al., 1998) ( $r_c = 0.987^2$ ) and Europe (Sointu et al., 2014) ( $r_c = 0.996$ ) as indicated by the large ( $> .95$ ; Jensen, 1999) coefficients of congruence.

**Table 2.** Correlations between Latent Factors

	1	2	3	4	5
Interpersonal Strengths	–				
Intrapersonal Strengths	.85	–			
Affective Strengths	.87	.90	–		
Family Involvement	.84	.80	.75	–	
School Functioning	.79	.78	.65	.72	–

Using the correlations between the five factors to fit a second-order factor resulted in slight, but statistically significant worse fit than the five-factor model ( $\Delta\chi^2_{(5)} = 49.29, p < .001$ ;  $\Delta CFI = .002$ ); however, these two models can be considered roughly equivalent based on the negligible change in CFI. The second-order (i.e., Strength Index) factor's loadings were combined with the primary factor's (e.g., interpersonal strengths, school functioning, etc.) loadings to calculate the Schmid-Leiman transformed solution for the model. The residualized primary factor loadings revealed that responses to items on the interpersonal strengths and intrapersonal strengths subscales were largely explained by the general strength index (*Mdn* residualized primary loading = .25; range = .17–.32) suggesting that the subscales may not be well differentiated from the general strength factor. The other three subscales demonstrated adequate uniqueness as indicated by the majority of  $>.30$  residualized primary factor loadings (*Mdn* = .37; range = .16–.51). The small residualized primary factor loadings for the interpersonal and intrapersonal strength factors mean that between 4% and 10% of the variation in item responses is accounted for by the two factors (*Mdn* residualized  $R^2 = .06$ ) while the general strength index factor accounts for between 29% and 67% of the variation in item responses. Contrast that with the comparatively large residualized primary factor loadings for the affective strengths, family involvement and school function factors mean that between 3% and 26% of the variation in item responses is accounted for by the three primary factors (*Mdn* residualized  $R^2 = .14$ ) while the general strength index factor accounts for between 8% and 56% of the variation in item responses. It should be noted that the items on the school function factor provide the most uniqueness after accounting of the general factor.

Since the five-factor and second-order structures were supported by the CFA models, coefficient alpha was computed for each subscale and the overall strength index. Estimates of internal consistency were acceptable ( $>.80$ ; Nunnally, 1978) for each score: interpersonal strengths ( $\alpha = .94$ ), intrapersonal strengths (.89), affective strengths (.84), family involvement (.84), school functioning (.93), and strength index (.97).

### Discussion

Overall, there was moderately strong evidence in support of the hypothesized five-factor structure with a general strength index factor. CFA model fit was acceptable for the five-factor and second-order models; however, neither model fit the data *closely*. In addition, the factor solution was nearly identical to the factor solutions identified for samples of US and European students. Internal consistency estimates also support the reliability of the subscale and overall scores. These findings, in consideration with other research on the reliability and validity of the Lithuanian-translated BERS-2 (Sointu et al., 2014), support the use of the BERS-2, when rated by teachers, to assess the behavioral and emotional strengths of students in Lithuania.

The near equivalence in fit between the five factor and second-order models is an interesting and unique finding of this study given that higher-order factor models have been largely absent from the literature on the BERS. The present study provides moderate empirical

evidence of a single overarching strength factor. The small difference in CFI suggests that the practical difference in fit between the two models is marginal. On the other hand, this small difference in fit seems to suggest that the correlational structure between subscales is not quite unidimensional — while four of the five factors are highly intercorrelated, school functioning was less intercorrelated with the other factors and contains more unique information as indicated by the Schmid-Leiman transformation. Future research on the BERS-2 should test alternative higher-order models such as bi-factor models which could not only provide empirical support for an overall index, but also help inform teachers, school psychologists and administrators as to when to use the subscales scores and when it is better to use just the overall strength index.

#### *Limitations*

This study is not without limitations. The first major limitation was that the sample was drawn at convenience and therefore it is possible that the findings may not generalize to the broader population. Future research should continue to investigate the psychometric properties of the Lithuanian BERS-2 scores with samples selected at random. Furthermore, the sample was homogeneous in terms of race and ethnicity within Lithuania which may also limit the generalizability of the findings to the larger Lithuanian population. Future research should incorporate more diverse samples in Lithuania, which might represent the population of students and teachers more closely. Third, the teachers who participated in this study were volunteers. Ratings by volunteer teachers may differ in specific and meaningful ways from ratings of those who did not volunteer leading to bias in the estimates of psychometric properties. Finally, despite some encouraging findings on the factor structure of the Lithuanian BERS-2, additional research on the psychometric properties of the Lithuanian BERS-2 scores should be conducted to examine convergent and discriminant validity as well as test-retest reliability. Such studies may provide additional support for the use of the BERS-2 within educational and mental health settings throughout Lithuania.

#### **Conclusion**

There is a growing body of evidence supporting the psychometric quality of the BERS-2 scores across a diverse range of youth populations in North America, Northern Europe and now Eastern Europe. The findings from this study support the use of the Lithuanian translated BERS-2 for use by schools and teachers in Lithuania. Given the increasing calls for a strength-based approach to assessment and education in Scandinavian and European countries, there is an obvious need for instruments with demonstrably valid and reliable scores that can be translated and applied on an international scale.

The Lithuanian BERS-2 has a number of individual and school-wide uses. First, it can be used as part of a comprehensive evaluation process for identifying students who have areas of limited strengths that may put them at-risk for school failure. Such students might benefit from additional academic or behavioral support to improve such areas. Second, many parents are frustrated with the deficit based approach and negative outlook from typical assessments (Leeber et al., 2011). Using a strength based assessment such as the BERS-2 as a starting point for parent-teacher discussions may be more attractive to parents as they focus on the child's strengths and potential for growth rather than their failures. As a result, parents might be more likely to engage with school personnel and mental health professionals in planning meetings. Third, to determine the effectiveness of an individual or school-wide intervention over time, the teachers could complete the BERS-2 on all of their students at the beginning of the school year and again at the end of the intervention to determine if scores improve. For example, a school may have all of the teachers complete the BERS-2 and find that high proportion of their students score low on the Family Involvement subscale. To improve family

involvement the school administrators may try to increase parent participation in the school by having an open house for parents twice a year, sending more positive notes home about student successes in school, and increasing volunteer opportunities for parents within the school. At the conclusion of the school year, teachers could complete the BERS-2 on all of their students again to determine if the activities had a positive effect by comparing the scores on the Family Involvement subscale again. Finally, the BERS-2 can be used in Lithuania as a measure in research and evaluation efforts across schools to help determine policies and procedures that may improve outcomes for all students from a strength-based perspective. Such policies might include strategies that focus on enhancing family involvement and interpersonal skills that lead to positive outcomes for students.

### Footnotes

<sup>1</sup> The second-order model has the same item-to-factor structure of the five-factor model with an additional latent factor measured by the five ‘first-order’ latent factors. This general factor (called the *strength index*) ‘causes’ the interrelationships between the five factors and thus between the set of individual items.

<sup>2</sup> The factor solution reported by Epstein, Ryser and Pearson (1998) was an explorative model identified using principal axis factoring with an oblique rotation. The authors only reported predominate factor loadings which were used to estimate the coefficient of congruence.

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### Summary

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University of Nebraska at Omaha, USA  
Renata Geležinienė, Siauliai University, Lithuania*

When the purpose of an evaluation or assessment is to make decisions regarding eligibility for special services or to design educational or therapeutic intervention plans, it is essential to consider the behavioral and emotional strengths, assets, and resources a child possesses so that decisions can be made accurately and interventions can be designed accordingly. However, according to a recent study on the assessment practices of children with special needs in Europe, assessment and evaluation of children's strengths is clearly lacking in traditional psychometric tests (Lebeer et al., 2011). Approaches to identifying a child's strengths and assets is significant as they can influence a child's interactions with parents, peers, and teachers, which can in turn impact the child's social and emotional development (Brofenbrenner, 1979). In Lithuania, the Ministry of Education and Science approved a policy entitled, The Concept of Assessment of Pupils' Achievement and Progress, which was developed to outline strategies for assessment and to identify key elements in the assessment process. Among the key elements of this policy was that assessments should encourage student motivation by emphasizing strengths and achievement rather than failure.

Internationally there has been increased recognition of the value of strength based assessment in educational and mental health service delivery. In this study the teacher version of BERS-2 was translated into Lithuanian to determine its factor structure for use in Lithuania. The BERS-2 is a 52-item standardized norm-referenced assessment that measures the strengths of children 5 to 18 years of age and includes separate rating scales for youth, parent, and teacher (Epstein, 2004). Each item is measured on a four-point Likert-type scale. The items form five subscales: (1) interpersonal strengths, (2) intrapersonal strengths, (3) affective strengths, (4) family involvement, and (5) school functioning. The subscale scores are combined to form the overall Strength Index. Teacher ratings were evaluated in this study.

The results suggest that the Lithuanian BERS-2 can be a useful strength based assessment for teachers and schools in Lithuania. Strength-based measures can be used to assist in intervention planning by identifying skills and resources a child may possess so that they can identify areas for potential growth and improve deficit areas.

Overall, there was moderately strong evidence in support of the hypothesized five-factor structure with a general strength index factor. CFA model fit was acceptable for the five-factor and second-order models; however, neither model fit the data *closely*. In addition, the factor solution was nearly identical to the factor solutions identified for samples of US and European students. Internal consistency estimates also support the reliability of the subscale and overall scores. These findings in consideration with other research on the reliability and validity of the Lithuanian-translated BERS-2 (Sointu et al., 2014), support the use of the BERS-2, when rated by teachers, to assess the behavioral and emotional strengths of students in Lithuania.

The near equivalence in fit between the five factor and second-order models is an interesting and unique finding of this study given that higher-order factor models have been largely absent from the literature on the BERS. The present study provides moderate empirical evidence of a single overarching strength factor. The small difference in CFI suggests that the practical difference in fit between the two models is marginal. On the other hand, this small difference in fit seems to suggest that the correlation structure between subscales is not quite unidimensional — while four of the five factors are highly intercorrelated, school functioning was less intercorrelated with the other factors and contains more unique information as indicated by the Schmid-Leiman transformation. Future research on the BERS-2 should test alternative higher-order models such as bi-factor models which could not only provide empirical support for an overall index, but also help inform teachers, school psychologists and administrators as to when to use the subscales scores and when it is better to use just the overall strength index.