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The Factor Structure of the CIBS-II-Readiness Assessment

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Abstract

The Brigance Comprehensive Inventory of Basic Skills-II (CIBS-II)-Readiness form is a diagnostic battery intended for children aged 5 and 6 years. The CIBS-II-Readiness is a new version of the CIBS-Revised-Readiness and includes updated normative information on a larger representative sample in comparison to the CIBS-Revised-Readiness. Empirical support for the CIBS-Revised-Readiness was lacking, especially score validity evidence. Adequate score validity information needs to be provided. The purpose of this study was to investigate evidence of construct validity of the composite scores on the CIBS-II-Readiness by examining the internal structure of the instrument and correlations with external measures. Confirmatory factor analysis was employed to compare the model implied by the composite score structure of the assessment to other plausible models. A six-factor model was supported. CIBS-II-Readiness scores had significant correlations with the Dynamic Indicators of Basic Early Literacy Skills scores, another widely used measure assessing five major components of early literacy.

Keywords

readiness assessment, confirmatory factor analysis, validity, CIBS-II

School readiness refers to a student possessing a set of prerequisite skills and abilities (e.g., knowledge, attitudes, behaviors) that will allow that student to benefit from high-level instruction rather than struggling to master foundational skills (Anastasi & Urbina, 1997). In recent years, much attention has been devoted to the issue of school readiness. The Good Start, Grow Smart initiative (White House, 2002) emphasized creation of learning standards and the application of scientific knowledge to early childhood education. Dramatic proliferation of state-funded prekindergarten has occurred, and now more than $5 billion dollars are spent annually on 1.2 million children across 38 states (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). These actions represent what has been dubbed an *educationalization* of early care and education (Kagan & Kauerz, 2007).

Potential interrelated driving forces behind heightened focus on school readiness are easy to surmise. The relationships between school readiness and later achievement are positive and strong (e.g., Duncan et al., 2007). Such relationships arouse concern when considered in

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conjunction with the professional judgments of teachers, which indicate that students in the early elementary grades may be lacking adequate preparedness in basic cognitive skills such as counting to 20, knowing most of the letters of the alphabet, and ability to produce rhyming words (Pavelchek, 2005). Indeed, there is a special issue of *Educational Researcher* (2010, volume 39) that focuses on what preschools, homes, and schools need to do to assist our children in learning to read and write, through an examination of the National Early Literacy Panel report. In the accountability environment of contemporary public education, where explicit demands are being made of all schools with respect to early elementary achievement, a downward extension of accountability systems to younger ages is a natural progression. Within these systems, decisions are made about individual students and readiness programs, based on students' performances on readiness assessments, which are said to diagnose weaknesses in specific skill areas (McMillan, 2007). However, technically sound measures of school readiness are imperative to defend these decisions.

The present study examines a popular readiness assessment, the Comprehensive Inventory of Basic Skills-II-Readiness (CIBS-II-Readiness), the scores from which have not undergone extensive validation. In fact, the first and second editions of the CIBS-Readiness scales lacked substantial score validity evidence (Cizek, 2001). The quality of CIBS-Readiness assessment can be evaluated based on the degree to which explanations exist for examinees' scores (Zumbo, 2009). We focus on two of five common sources of explanations (i.e., internal structure, relations to other variables; American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). The extent to which scores can be accounted for by a prescribed map of latent abilities provides an evaluation of how well the measurement instrument captures the construct(s) of interest. Through an examination of the relationships between the Readiness scores and other measures' scores, we can further expound the underlying patterns rendering those scores. These analyses serve as an essential precursor to studies of how well CIBS-II-Readiness scores predict outcomes (e.g., academic achievement).

The CIBS, first introduced in 1976, is a curriculum-based achievement measure designed to be administered by professionals (e.g., classroom teachers, school psychologists) for the purposes of assessing mastery, identifying strengths and weaknesses, planning an instructional program for a student, and providing immediate feedback on achievement levels and areas that may benefit from additional instruction (Brigance, 1998). The CIBS-II-Readiness represents the latest generation of CIBS-Readiness assessments, with a more representative standardization sample and new assessments of phonemic awareness. The instrument addresses a more comprehensive range of skills compared with many skills-oriented readiness assessments (e.g., Bracken, 2007; Phelps, 2003). Example CIBS-II-Readiness subtests include gross motor skills, reading lowercase letters, and articulation of final word sounds, as seen in Table 1. Quality sources exist that have lengthy discussions covering the assessment of each skill area (e.g., reading, writing, visual-motor, creativity; Reynolds & Kamphaus, 2003). The CIBS-II-Readiness results can be used as supplemental information for making instruction decisions, in accord with many readiness assessments (Nitko & Brookhart, 2007).

The CIBS-II-Readiness follows the general trend of readiness instruments in its coverage of verbal and reading ability assessments (e.g., McMillan, 2007), especially with the introduction of subtests measuring phonemic awareness. Another popular assessment with a literacy orientation is the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Deno, 1985; Deno & Mirkin, 1977). The measures included in the DIBELS assess five major components of early literacy—phonemic awareness, alphabetic principle, accuracy and fluency, vocabulary, and comprehension—as identified by the National Reading Panel. Because of the DIBELS's partial

Table 1. Comprehensive Inventory of Basic Skills-II-Readiness Assessments by Factor That Contribute to the Score Structure of the Test and Their Respective Internal Consistency Reliability Coefficients

	α
General Knowledge and Language	
Identifies Body Parts	0.78
Personal Data Response	0.62
Understands Directional and Positional Concepts	0.70
Gross Motor Skills	
Standing Gross Motor Skills	0.78
Walking Gross Motor Skills	0.82
Graphomotor & Writing Skills	
Prints Personal Data	0.58
Prints Uppercase Letters in Sequence	—
Writes Numerals in Sequence	—
Reading	
Readiness for Reading	0.85
Reads Lowercase Letters	0.95
Knows Common Signs	0.86
Oral Expression	0.94
Math	
Counts Objects	0.65
Reads Numerals	0.87
Rote Counting	0.95
Understands Quantitative Concepts	0.83
Phonemic Awareness	
Articulation—Final Sounds of Words	0.88
Articulation—Initial Sounds of Words	0.88
Auditory Discrimination	0.96
Identifies Initial Consonants in Spoken Word	0.95
Sounds of Letters	0.96

Note: Some subtests were composed of a single item score and therefore could not be submitted to internal consistency calculations.

content overlap with the CIBS-II-Readiness, it was used for comparison with CIBS-II-Readiness scores on skills (i.e., literacy) typically of most concern with young children (McMillan, 2007; Nitko & Brookhart, 2007; Shanahan, & Lonigan, 2010).

The wide use by classroom teachers of previous versions of the CIBS (McLellan, 2001) indicates that the latest version of the assessment has the potential to affect many children. Through the second edition of the instrument (CIBS-Revised-Readiness) there was a lack of quality score validity evidence (Cizek, 2001). No prior analysis of the factor structure exists, for example. The need for more sources of evidence for score validity to support the CIBS-II-Readiness and the need for quality instruments to be available in the accountability domain of readiness assessment were motivating factors for this study. Specifically, this study represents some of the necessary validation work for the CIBS-II-Readiness to support the decisions, in combination with other information, which will be made about the individual student. Our focus was on evaluating the factor structure of the CIBS-II-Readiness and the resulting scores' correlations with external variables.

Method

Participants

A stratified random sample of kindergarteners ($N = 383$; $M_{age} = 5.92$ years, $SD_{age} = 0.39$ years) from 33 sites located in four main regions of the United States (i.e., Northeast [14.4%], South [47.3%], Midwest [27%], West [11.3%]) participated in this study. Data for this standardization sample were provided by Curriculum Associates, Inc. Data collection procedures adhered to proscribed administration protocol for the CIBS-II-Readiness, maximizing ecological validity of the findings. A full description of data collection procedures appears in the manual (French & Glascoe, 2010). Sex representations were essentially equal (50.1% = female, 49.9% = male) and racial representations were as follows: 54% White, 20% Hispanic, 16% African American, 2% Asian, 4% multiple races, and 4% other. These percentages closely matched national proportions for elementary school–aged children (Department of Education, Institute of Education Sciences, 2007). Educational level of students' parents included no high school degree (11%), a high school degree (22%), some college course work (20%), and a college degree or higher (47%). About one third (32%) of the students received free or reduced school lunches.

Instruments

CIBS-II-Readiness. The CIBS-II-Readiness instrument is individually administered and designed to assess a child's preparedness for entering kindergarten or first grade, areas of learning strengths and weaknesses, and progress in skill development over the course of a school year (French & Glascoe, 2010). The content areas addressed by the CIBS-II-Readiness reflect skills identified as pertinent to early achievement in literacy (e.g., auditory discrimination, rote counting, identifying letter sounds, writing one's name; Shanahan & Lonigan, 2010) and numeracy (e.g., rote counting, quantity discrimination, number identification; Martinez, Missall, Graney, Aricak, & Clarke, 2009). The content also reflects areas common to other developmental assessments, such as gross motor skills (e.g., DIAL-3; Mardell-Czudnowski & Goldenberg, 1998; ESI-R; Meisels, Marsden, Wiske, & Henderson, 2008) where problems on such skills can be predictive of children who develop learning difficulties. The link between skills measured on these assessments and later achievement support the ecological validity of these tasks. The 21 subtests used to calculate composite scores reflect different dimensions of school readiness (Table 1). The average length of time for administration is 45 to 55 minutes.

The Readiness subtests consist mainly of dichotomously scored items with subtest scores reflecting total numbers of correct responses or observed skills. Other scoring mechanisms either award a single point for correctly completing a series of tasks (e.g., writing 10 numerals in sequence) or make use of teacher ratings on short rating scales. Reliability (internal consistency) coefficients of the subtest scores ranged from .58 to .96 (Table 1). Test–retest coefficients ranged from .73 to .99.

Dynamic indicators of basic early literacy skills. The DIBELS (Deno, 1985; Deno & Mirkin, 1977) are measures for examining the acquisition of early literacy skills for students ranging from kindergarten through sixth grade. DIBELS is composed of very brief fluency measures used to monitor frequently the development of early literacy and reading skills. As we obtained only total score information, we could not assess internal consistency reliability of the measure. DIBELS has been compared with other assessments used in various states (e.g., Barger, 2003; Wilson, 2005). The oral reading fluency subtest, for example, had a correlation of .74 with the Arizona Instrument to Measure Standards (Wilson) and a correlation of .73 with the North Carolina Reading Assessment (Barger), providing evidence of score validity.

Analysis

This study reports on two sets of analyses. The first involves the confirmatory factor analysis of the CIBS-II-Readiness. Models were evaluated to gather support for the assessment's internal structure. The second analysis involves the examination of correlations between CIBS-II-Readiness scores and DIBELS scores to support construct validity through correlations with other measures. Details of each analysis are presented below.

Confirmatory Factor Analysis

The internal structure of the Readiness assessment was examined via confirmatory factor analysis (CFA). Power analysis for testing the latent factor models assuming conservative cases (less than ideal fit) resulted in a range of N from 170 to 514 for power of .80 (Hancock, 2006). Skewness and kurtosis for each subtest were <1, and multivariate kurtosis of 1.046 was within the bounds for assuming multivariate normality (Bollen, 1989). Maximum likelihood estimation via LISREL 8.80 (Jöreskog & Sörbom, 2006) was used to conduct the CFA using the covariance matrix of subtest scores.

Three a priori specified latent factor models were examined. Model 1 represented the six-factor model of readiness (e.g., General Knowledge and Language, Gross Motor Skills, Graphomotor and Writing Skills, Reading, Math, and Phonemic Awareness) originally proposed in the content development of the assessment. Model 2 represented a one-factor structure. Although this structure was not advocated by the test developers, a lack of model fit in such a case would provide evidence that the readiness assessment is not unidimensional. Model 3 was a second-order model where Model 1 first-order factors all indicated a general readiness factor. Such a second-order model should be inspected in the presence of a correlated first-order model (Thompson, 2004). Post hoc alterations of these models were conducted in response to results and with consideration of their conceptual meaningfulness. For model specification, the loading of each factor with its first indicator was set to a value of 1.

Model evaluation. Several indicators were used to assess model fit. The chi-square test provided a measure of fit in terms of statistical significance ($\alpha = .05$). Given the sensitivity of the chi-square statistic to sample size, other fit indices were considered. The comparative fit index (CFI) and Tucker–Lewis index (TLI) were used to indicate the difference in fit of the null and target models relative to the fit of the null model. The standardized root mean square residual (SRMR) represented the standardized difference between the observed covariance and predicted covariance. Following the recommendations of Hu and Bentler (1999), CFI and TLI values of .95 or greater and SRMR values of less than .08 provided cutoff criteria for well-fitting models.

In addition to consideration of fit indices, models were examined for the presence of other indicators that could signify lack of fit (e.g., residuals, interfactor correlations). Well-fitting models should possess standardized residuals that follow a relatively normal frequency distribution and do not exceed an absolute value of 2.00 (Brown, 2006). Maximum modification indices were considered both in terms of influence on model fit and conceptual meaningfulness. The approach to model modification was conservative to minimize the likelihood of acting on chance occurrences in the study sample.

The chi-square difference test provided statistical comparisons of nested models (e.g., Model 1 vs. Model 3). The Akaike information criterion (AIC) was employed for nonnested model comparisons (e.g., Model 1 vs. Model 2). Relatively lower AIC values indicate better fit without the use of too many parameters (Akaike, 1987).

Table 2. Model Fit Results for the Comprehensive Inventory of Basic Skills-II-Readiness Assessments

Model	Number of Factors	χ^2	*df*	*p*	CFI	TLI	SRMR	AIC
1	6	787.11	174	<.01	.95	.94	.07	942
1[a]	6	637.13	173	<.01	.96	.96	.06	790
2	1	992.82	189	<.01	.94	.93	.07	1,172
3	6 first order; 1 second order	906.57	185	<.01	.95	.94	.13	1,036

Note: CFI = comparative fit index; TLI = Tucker–Lewis index; SRMR = standardized root mean square residual; AIC = Akaike information criterion.
a. Includes correlation between error terms of the Articulation—Initial Sounds of Words and Articulation—Final Sounds of Words subtests.

Correlations With External Measures

Correlations were calculated for the six composite scores from the CIBS-II-Readiness and four scores available on the DIBELS—Initial Sounds Fluency, Letter Naming Fluency, Phonemic Segmentation Fluency, and Nonsense Word Fluency. The correlations computed between the DIBELS and the CIBS-II-Readiness scores were based on subsets of the student data used for the CFA. These students were from sites in Iowa and Florida. One subset ($n_{\text{total}} = 46$, $n_{\text{females}} = 24$) completed the Initial Sounds Fluency and Letter Naming Fluency portions of the DIBELS, and another subset ($n_{\text{total}} = 44$, $n_{\text{females}} = 20$) completed the Letter Naming Fluency, Phonemic Segmentation Fluency, and Nonsense Word Fluency portions. The DIBELS scores for these students were provided by the examiner who administered the CIBS-II-Readiness form. We expected high correlations (i.e., .60, range .4-.70) between the DIBELS scores and the CIBS-II-Readiness Reading and Phonemic Awareness scores. Past work has reported correlations of similar measures with DIBELS ranging from .38 to .73 (e.g., Reidel, 2007). We expected DIBELS scores would not be as highly correlated with other CIBS-II-Readiness factors, such as Gross Motor Skills.

Results

Validity Evidence Based on Internal Structure

Model 1 rendered CFI and SRMR values that met cut-off criteria, but the TLI did not meet the set criterion. See Table 2 for fit information for all models. Fit indices for Model 2 failed to meet cut-off criteria for the CFI and TLI yet met the SRMR criterion. Given the fit of Model 2 and its higher AIC value compared with Model 1, Model 2 was not examined further. Model 3 presented CFI and TLI magnitudes comparable with Model 1 but had a large SRMR and significantly larger χ^2 ($\chi^2_{\text{difference}}(11) = 119.46, p < .05$) and so was not examined further.

A high modification index suggested a correlation between error terms of the Articulation—Initial Sounds of Words and Articulation—Final Sounds of Words subtests in Model 1. Given justification based on potential measurement effects and potential unaccounted for factors (Brown, 2006), Model 1 was modified (Model 1a) to allow the two Articulation subtest error terms to correlate. This modification significantly improved fit ($\chi^2_{\text{difference}}(1) = 149.98, p < .05$).

Among the models tested, Model 1a appeared to fit best, with the lowest χ^2 and AIC and adherence to all fit criteria. Interfactor correlations greater than .85, as seen in Table 3, were present; however, a second-order factor did not provide better fit. Table 4 contains factor pattern and structure coefficients for Model 1a. Most subtests exhibiting the highest loadings with a given

Table 3. Interfactor Correlations for Confirmatory Factor Analysis of the Comprehensive Inventory of Basic Skills-II-Readiness

	General Knowledge	Gross Motor Skills	Graphomotor & Writing Skills	Reading	Math	Phonemic Awareness
General Knowledge	1.00					
Gross Motor Skills	.54	1.00				
Graphomotor & Writing Skills	.84	.50	1.00			
Reading	.82	.51	.92	1.00		
Math	.80	.56	.91	.91	1.00	
Phonemic Awareness	.79	.42	.85	.93	.90	1.00

factor were the ones intended to load on that factor. Exceptions were present, however, and are discussed in the next section. Further modifications to Model 1a lacked justification from empirical and content perspectives (e.g., Rote Counting subtest to load on Graphomotor &Writing Skills factor).

In response to problematic factor structure coefficients, high interfactor correlations, and reviewer suggestions, a four-factor model was assessed. The four factors—General Knowledge, Gross Motor Skills, Reading, and Math—were identified based on content groupings. The correlation of error terms from Model 1a was retained. Fit was comparable with but perhaps slightly worse (e.g., higher AIC) than Model 1a, $\chi^2(182) = 652.95$, $p < .01$, CFI = 0.96, TLI = 0.96, SRMR = 0.06, AIC = 807. More important, this model also possessed high interfactor correlations (.49-.92) and did not solve the concern with structure coefficients in Model 1a.

Validity Evidence Based on Relations to DIBELS Scores

Table 5 displays correlations between the CIBS-II-Readiness scores and DIBELS scores. Correlations were in the expected directions. For example, the correlations between the DIBELS scores and the Gross-Motor, Graphomotor & Writing, and General Knowledge and Language scores were generally lower (range = .16-.49) compared with the correlations with the DIBELS scores and Reading and Phonemic Awareness scores (range = .36-.62). The correlations between Letter Naming Fluency and Reading ($r = .62$), Initial Sounds Fluency and Phonemic Awareness ($r = .59$), Initial Sounds Fluency and Reading ($r = .58$), and Nonsense Word Fluency and Reading ($r = .59$) were significant ($p < .05$) and represented moderate effect sizes ($d = 1.15$-1.50; Sattler, 2008). This pattern of correlations provides evidence that the Readiness measures assess skills similar to those assessed by DIBELS. Some findings, such as the correlations between the CIBS-II-Readiness Math and DIBELS Letter Naming Fluency scores ($r = .53$), might suggest a lack of discriminant validity evidence. However, the skills needed to successfully complete the Reads Numerals and Rote Counting subtests (i.e., identify and say a number) that contribute to the Math composite score are nearly identical to the skills needed to complete the DIBELS subtest tasks (i.e., identify and say a letter). Thus, high correlations are not surprising.

Discussion

Evidence for the validity of scores obtained from the CIBS-II-Readiness has been established through analysis of the internal structure of the measure and correlations with other variables.

Table 4. Pattern and Structure Coefficients for Confirmatory Factor Analysis of the Comprehensive Inventory of Basic Skills-II-Readiness

Subtest	General Knowledge	Gross Motor Skills	Graphomotor & Writing Skills	Reading	Math	Phonemic Awareness
Identifies Body Parts	**.67**	.36	.56	.55	.54	.53
Understands Directional and Positional Concepts	**.67**	.36	.56	.55	.54	.53
Personal Data Response	**.63**	.34	.53	.52	.50	.50
Walking Gross Motor Skills	.48	**.90**	.45	.46	.50	.38
Standing Gross Motor Skills	.34	**.63**	.32	.57	.35	.26
Writes Numerals in Sequence	.59	.35	**.71**	.65	.64	.60
Prints Personal Data	.57	.34	**.68**	.62	.62	.58
Prints Uppercase Letters in Sequence	.48	.29	**.58**	.53	.53	.49
Readiness for Reading	.72	.45	.80	**.88**	.80	.82
Reads Lowercase Letters	.68	.42	.76	**.83**	.75	.77
Knows Common Signs	.68	.42	.76	**.82**	.75	.77
Oral Expression	.53	.33	.59	**.65**	.59	.60
Reads Numerals	.66	.46	.75	.75	**.83**	.74
Rote Counting	.65	.46	.75	.75	**.82**	.74
Understands Quantitative Concepts	.50	.35	.57	.57	**.63**	.57
Counts Objects	.40	.28	.45	.45	**.50**	.45
Identifies Initial Consonants in Spoken Word	.67	.36	.72	.79	.76	**.85**
Sounds of Letters	.67	.36	.72	.79	.76	**.85**
Auditory Discrimination	.35	.19	.38	.42	.40	**.45**
Articulation—Initial Sounds of Words	.23	.12	.25	.27	.26	**.29**
Articulation—Final Sounds of Words	.19	.10	.20	.27	.21	**.24**

Note: Values in boldface indicate pattern coefficients.

Evidence supports the use of the scores in the intended manner. To date no validation work this extensive has been carried out with the CIBS-II-Readiness. Given an educational climate that is increasingly emphasizing assessments of children's readiness for school, the need is strong for gathering information about how well decisions about these children can be supported by explanations of test scores.

The structure of the CIBS-II-Readiness appears to be multidimensional and generally follows the structure (six latent factors) advocated by the developers. However, high interfactor correlations remain in this model, and an examination of the factor pattern and structure coefficients revealed overlap among subtests and factors. The Readiness for Reading subtest, for example, exhibited high loadings with all the factors except Gross Motor Skills. Consider the case of Graphomotor & Writing Skills, where the structure coefficient for Readiness for Reading (.80) was higher compared with coefficients for the three subtests specified to load on Graphomotor & Writing Skills (i.e., .71, .68, .58). Similar patterns were observed throughout the results. However, given this pattern, the magnitude of difference between coefficients within any given factor, on average, was not very large. General Knowledge, for example, had coefficients ranging from .63 to .67 for its indicators compared with a range of .19 to .72 for nonindicators. In comparing the highest nonindicator coefficient to the highest indicator coefficient across factors, the median

Table 5. Correlations of CIBS-II-Readiness Composites With the DIBELS Measure

	CIBS-II-Readiness Composites					
DIBELS	General Knowledge	Gross Motor Skills	Graphomotor & Writing Skills	Reading	Math	Phonemic Awareness
Initial Sounds Fluency	.24*	.46	.40	.58	.38	.59
Letter Naming Fluency	.39	.16*	.49	.62	.53	.47
Phonemic Segmentation Fluency	.33	.33	.28*	.44	.47	.46
Nonsense Word Fluency	.40	.24*	.35	.59	.56	.36

Note: CIBS = Comprehensive Inventory of Basic Skills; DIBELS = Dynamic Indicators of Basic Early Literacy Skills.
*Nonsignificant correlations ($p > .05$).

difference was –.02. In comparing the highest nonindicator coefficient with the lowest indicator coefficient, the median difference was .18. The relevance of the results to the user of the CIBS scores is that one can be confident the composite scores measure the underlying skills of interest. Secondary skills are being assessed (e.g., reading skills within the rote counting assessment), but such skills are better measured by the subtests that are intended to measure those skills. Additionally, such skills at this age are overlapping (e.g., recognize and say a letter vs. recognize and say a number).

One more result of note among the coefficients was present in the two Articulation subtests. The Phonemic Awareness factor did not account for a high level of variance with either of these subtests, only about 6% to 9%. The low loadings, correlated error terms, and content could suggest there is another factor not in the model with which the Articulation subtests would be more closely related. These two subtests are the only ones that require students to recognize and label pictures of objects. Although the Articulation subtests are not well accounted for by the model, the test developers considered these subtests necessary components of the Phonemic Awareness factor for content reasons. Moreover, the addition of the correlation of error terms is in accord with factor models of other literacy measures (Townsend & Konold, 2010). Further examination of how to strengthen these assessments is warranted.

High interfactor correlations, as observed in this study, are not uncommon with achievement measures. For example, the TerraNova achievement test system (CTB/McGraw-Hill, 1997), with reports of high interfactor correlations and high structure coefficients on nonindicator factor subtests, begs questions about the interpretability of its factor structure (Stevens & Zvoch, 1997). Additionally, the KeyMath Revised Normative Update (Connolly, 1998) also displayed high interfactor correlations among its factor structure (Williams, Fall, Eaves, Darch, & Woods-Groves, 2007). With such measures it could be that a student's performance is influenced by the presence of "common, nonachievement features of performance such as decoding or problem solving" (Stevens & Zvock, p. 987).

Looking into the developmental literature and to domains related to social and emotional skills, children's abilities to make finer domain-specific distinctions of their competence appear to increase with development (Marsh & Ayotte, 2003). In a sample of first- and second-grade children, for example, the correlations between factors on a perceived competence scale (e.g., cognitive and physical competence) at first grade were higher (ranging from .63 to .78) compared with the correlations between the factors at second grade (ranging from .62 to .68; French & Mantzicopoulos, 2007), supporting that perception of domains do become more distinct as children develop. Such results help explain the elevated correlations among factors on the CIBS-II-Readiness assessment.

In practice, complete use of all the Readiness assessments may not be an efficient use of resources, as composite scores may provide redundant information. However, not always will the complete battery of assessments be used. In cases where only the assessments from one or two composites are implemented, as suggested by the manual, having information that pertains specifically to those composites may be useful. The validity of score inferences based on a model with six correlated factors is supported by results, but caution should still be exercised when working with this structure. The fit indices were adequate yet the χ^2 was high with a modest sample size. The bulk of the residuals for Model 1a approximated a normal distribution, but with a range (±5.00) exceeding suggested criteria (Brown, 2006). Continued examination of models may be warranted. Specification of additional models requires content experts' involvement, which was beyond the scope of this work. Some issues (e.g., high interfactor correlations) extend to other instruments for this age group as well.

This study is hampered by its inability to employ cross-validation of the model. Such a process would have affected not only the generalizability of the chosen model and strength of validity evidence provided but also the complexity of models considered. Recall that conservatism in model modification was employed in this study. The process might have been bolder with respect to modifications if invariance of the parameter estimates across an independent sample was available. Future research should cross-validate the six-factor model and examine the dimensionality of individual subtests to gain insight into how their characteristics may be influencing model fit as well.

Based on the success of previous CIBS editions, the CIBS-II-Readiness can be a valuable source of information in an evaluation process to provide insight on a child's current level on assessed skills to teachers, parents, and students. The CIBS-II-Readiness may remain popular in such environments, as data are collected in an everyday classroom setting and provide direct and immediate feedback. Such use of the Readiness scores, in concert with other measures of achievement, should allow for instruction and intervention to more accurately be conducted. The ability of the CIBS-II-Readiness to do such tasks with meaning hinges on the validity evidence to support score-based inferences. Indeed, establishing such evidence for readiness measures is paramount, as readiness assessment continues to wax. This study begins to provide such evidence and is one step in moving toward answering other validity questions (e.g., can CIBS-II-Readiness scores predict achievement) and providing confidence that the inferences drawn from scores reflect intended meaning.

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