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# Investigating the Structure of the Pediatric Symptoms Checklist in the Preschool Setting

**Christine DiStefano[1], Jin Liu[1], and Yin Burgess[1]**

**Abstract**

When using educational/psychological instruments, psychometric investigations should be conducted before adopting to new environments to ensure that an instrument measures the same constructs. Exploratory structural equation modeling and confirmatory factor analysis methods were used to examine the utility of the short form of the Pediatric Symptoms Checklist (PSC-17) in the school setting. Using a sample of 836 preschool children rated by teachers, three factors were identified across both techniques, with factors matching the hypothesized structure of the instrument. The PSC-17 may be an option for use in preschool settings when conducting behavioral and emotional screening.

**Keywords**

exploratory structural equation modeling, confirmatory factor analysis, preschool, multitiered systems of support, validation

For children at risk for behavioral and emotional problems, early intervention and assistance may help minimize long-term harm of mental disorders and reduce overall health care burden and costs (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004; Campaign for Mental Health Reform, 2005). To identify problematic behaviors, current efforts in prevention science have suggested a multitiered system of support (MTSS), typically within the school environment (Glover & Albers, 2007). This strategy includes different levels of testing to identify children at risk for illnesses and disorders, and early intervention to reduce risk, prevent the onset, or minimize the effects of a disorder.

Often, school-wide screening is included as the first tier of an MTSS (Glover & Albers, 2007). Use of a short emotional and behavioral screening instrument is an efficient, quick way to assess a large number of children and refer those flagged for additional testing. Furthermore, proactive use of a universal screening tool with all students may identify children as at risk that may be identified later, or even missed, by other methods.

Within the school context, teachers are well suited to conduct universal screening. Often, teachers observe different aspects of children in the classroom and are able to identify young children at high risk for attention, conduct, learning, mood, or other school adjustment problems,

[1]University of South Carolina, Columbia, SC, USA

**Corresponding Author:**
Christine DiStefano, Department of Educational Studies, University of South Carolina, 138 Wardlaw Hall, Columbia, SC 29208, USA.
Email: distefan@mailbox.sc.edu

with a great deal of accuracy (Flanagan, Bierman, & Kam, 2003; Taylor, Anselmo, Foreman, Schatschneider, & Angelopoulos, 2000). Teachers have the advantage of observing the child within a peer group, allowing a unique vantage point to distinguish between maladaptive and normal age-related behaviors (Kamphaus, DiStefano, Dowdy, Ecklund, & Dunn, 2010). Furthermore, school-based screening could be administered unobtrusively and proactively (e.g., near the beginning of the school year), allowing at-risk students quicker access to further testing and intervention.

For many children and parents, preschool may be the first opportunity for screening and assistance to occur. In addition, as states continue to fund and expand services for preschool-aged children (e.g., full-day programs, universal 4-year-old prekindergarten), numbers of students enrolling in prekindergarten are increasing. Young children's social, emotional, and behavioral development has been conceptualized as important as, and related to, cognitive and academic abilities for school readiness and later life success (Webster-Stratton & Reid, 2008). Thus, young children's behavioral adjustment is a concern among many practitioners, school administrators, and parents, especially as numbers of preschoolers increase.

Many instruments are available for conducting behavioral and social–emotional screening in the preschool environment. However, before a school or district adopts a screener, a myriad of factors must be considered. First and foremost is the psychometric quality of the scale, as the inferences made from the scores are directly related to the quality of the scale (Furr, 2011). Additional concerns include time which school personnel must devote to completing the screening instrument, relevancy of the construct(s) measured by the scale, cost of the instrument, and the infrastructure and personnel needed to score, interpret, and act upon results (Harrison, Vannest, & Reynolds, 2013).

## Pediatric Symptoms Checklist (PSC)

The PSC (Jellinek, Murphy, & Burns, 1986) addresses many of the aforementioned concerns. The PSC offers two versions: a "full" 35-item form and a 17-item screening form, called the PSC-17. These forms are available at no cost via the Internet (Jellinek & Murphy, 2006), and the measures are appropriate for children from 3 to 16 years of age. With both versions, items are rated on a 3-point scale, with anchors of "Never" = 0, "Sometimes" = 1, and "Often" = 2.

Both the PSC and PSC-17 assess three dimensions of maladaptive behavior: Attention Problems, Internalizing Problems, and Externalizing Problems. Scores are provided by dimension and, overall, through summing item responses. The website includes separate scoring directions for preschool children (3-5 years) with instructions and cut-scores to identify "at-risk" behaviors. Finally, the website provides citations to more than 100 peer-reviewed studies and reports, providing information about psychometric quality and validity associated with the instrument relative to other well-established instruments (e.g., Child Behavioral Checklist; Achenbach & Rescorla, 2001) as well as numerous studies investigating the utility of the form in various populations in the United States (e.g., low-income children, middle school students, Mexican American children) and results from other countries (e.g., Japan, Chile, Indonesia), which have used the PSC in studies of children's mental health (see http://www.massgeneral.org/psychiatry/services/psc_home.aspx for additional details).

While psychometric evidence and numerous previous studies exist, the PSC has been used primarily in the clinical environment—largely with clinicians, pediatricians, or parents providing ratings of a child's behavior. However, the authors have stated that the form is appropriate for use in the school environment, with teachers as the rater of a child's behavior (J. M. Murphy, personal communication, September 17, 2012). Here, we focus on the PSC-17, given that a screener may be incorporated into a school's MTSS framework.

While not the screener, the "full" PSC has been used in the school environment in Chile (Guzman et al., 2015) as part of a 3-year longitudinal study. Teachers provided ratings on the PSC for students in first grade, and students were tracked to third grade and reassessed. The PSC, however, was used as an outcome variable to show support for an intervention program, where students were initially identified as behaviorally at risk via a different teacher report measure. Given that the PSC was used as an outcome, additional evidence is needed to ensure that the form can identify at-risk students.

An initial crosswalk of the item content of the PSC-17 with three behavioral and emotional screening scales appropriate for the preschool environment (i.e., Attention, Behavior, Language, and Emotion [ABLE], Barbarin, 2007; Behavioral and Emotional Screening System [BESS], Kamphaus & Reynolds, 2007; Strengths and Difficulties Questionnaire [SDQ], Goodman, 2001) showed, in total, that content of 16 of the 17 items (94%) overlapped existing scales. By form, the percentage of items overlapping ranged from 9 of 17 (53%—BESS) to 14 of 17 (83%—SDQ). The one PSC-17 item that was not identified on the other three forms ("Fights with other children") was thought to reference similar content on at least one other scale (e.g., "Annoys other children on purpose"—BESS) and is relevant to the school environment. Thus, the PSC-17 appears to be appropriate for evaluating preschoolers' behavior at school.

Before adopting the PSC-17 for use in the schools, the *Standards of Educational and Psychological Testing* suggest that an in-depth review should be conducted to ensure the scale measures the same underlying variables with a new population (American Educational Research Association [AERA], American Psychological Association [APA], National Council on Measurement in Education [NCME], Joint Committee on Standards for Educational & Psychological Testing, 2014). Given this scenario, should analyses be exploratory, due to a new population of raters and a new environment, or confirmatory, given that the underlying structure of the scale has been identified with prior research studies?

## Structure of the PSC-17

Gardner et al. (1999) developed and validated the screener from the original PSC 35-item instrument using a sample of 18,045 children, aged 4 to 15, from a national primary care database. Using exploratory factor analysis (EFA) with cross-validation, the PSC-17 was developed, and three factors were identified (i.e., Internalizing, Attention, and Externalizing Problems), matching the theoretical structure of the longer instrument. Gardner and colleagues also indicated strong face validity and high internal consistency of the final solution. Recently, Stoppelbein, Greening, Moll, Jordann, and Suozzi (2012) used a sample of 723 parents' PSC-17 ratings of children (6-16 years) with type 1 diabetes or sickle cell disease and a non-ill control peer group to validate the three-factor model using both EFA and CFA (confirmatory factor analysis) methods. While the three-factor structure was validated, the CFA results did not meet cutoff values for acceptable model-data fit. Both studies (Gardner et al., 1999; Stoppelbein et al., 2012) showed support for three underlying factors with the PSC-17; however, previous studies have investigated a wide age band and neither sample included investigations in the preschool environment with teachers as raters.

## Methods for Providing Structural Evidence

Many statistical techniques exist to provide evidence of a scale's underlying structure. Factor analytic methods include both EFA and CFA. EFA generally assumes that the exact number of dimensions underlying a set of data is not known or at least is not well established. In contrast, if there is prior knowledge of a hypothesized dimensional structure of an instrument, CFA is recommended over exploratory analyses for researchers to incorporate prior knowledge of items and

scales into analyses (ten Holt, van Duijn, & Boomsma, 2010). Exploratory structural equation modeling (ESEM) has been recently established (Asparouhov & Muthén, 2009). This technique blends together elements of both EFA and CFA frameworks and may be used to examine an instrument's structure. ESEM may be appreciated in the early childhood field, as many preschool scales have been adapted from existing scales currently used with older children, and researchers cannot rely on the validity information previously collected with a different population (American Educational Research Association [AERA], American Psychological Association [APA], National Council on Measurement in Education [NCME], Joint Committee on Standards for Educational & Psychological Testing, 2014).

As with EFA, ESEM allows each item to associate with every factor and also allows rotation of the solutions, avoiding the (overly) restrictive assumption used with CFA that there is no association between items and factors, other than the specified relationships (i.e., freed parameters). In addition, many researchers consider EFA techniques "outdated" given these analyses cannot include covariates or conduct invariance tests (Marsh, Liem, Martin, Morin, & Nagengast, 2011; Marsh et al., 2010).

ESEM shares many similarities to the CFA framework as well. For example, different estimation techniques can be used to accommodate characteristics of the data (e.g., nonnormality, ordinal metric), and complex structures can be estimated. Like CFA, fit information is included to evaluate ESEM solutions. Finally, some studies that have used CFA have identified different structures between EFA and CFA of the same instrument (e.g., Teo, 2013). ESEM allows for use of one framework throughout a series of investigations exploring an underlying structure, with the ability to incorporate covariates and outcomes.

Recent investigations used ESEM to examine the underlying structure of an instrument and included comparisons between ESEM and CFA (Booth & Hughes, 2014; Furnham, Guenole, Levine, & Chamorro-Premuzic, 2012; Marsh et al., 2010; Marsh et al., 2009). Booth and Hughes (2014) concluded that recommendations preferring ESEM over CFA "appear premature, if not unwarranted" (p. 269) because there is little clear evidence to support ESEM over CFA. The authors suggested that both ESEM and CFA might be used concurrently to improve measurement. Further, for studies that assume that both common factor and domain specific factors may be of interest (e.g., bifactor model), ESEM might not be optimal, as items already associate with all factors, and, thus, general factors are not usually identified (Wiesner & Schanding, 2013).

While PSC-17 provides psychometric evidence to support its use, support has been provided with parent or clinician ratings. Given that the scale is available at no charge and contains content similar to other social/emotional screeners, the PSC-17 could be an option for a school-based MTSS program. While the content between the PSC-17 and the other measures reviewed (e.g., ABLE, BESS, and SDQ) was found comparable, the scale shared the most characteristics with the SDQ. Both scales (i.e., the SDQ and PSC-17) are freely distributed and measure multiple dimensions. Given the popularity of the PSC-17 with parents and clinicians, this instrument may be an option to use in the school environment as it is free, but also shorter, than the 25-item SDQ. Thus, the purpose of this study is to investigate the underlying factor structure of the PSC-17 for preschool children as rated by their teachers. The goal is to determine whether the screener measures the same factors in the preschool environment. Because the PSC-17 has been involved in many prior investigations, but has not been largely studied with teacher raters, both CFA and ESEM were used.

## Method

### *Sample*

As part of a larger grant investigating universal screening, preschool teachers from 12 elementary schools/child development centers in South Carolina provided PSC-17 ratings for all students in

their classrooms in the fall of 2012. Teachers' participation in the project was voluntary, and teachers received a small monetary stipend (US$25) for completing the forms. A total of 44 teachers participated; Institutional Review Board permission was obtained, and ethical treatment of subjects was followed during data collection and analysis.

School-wide universal screening was conducted using the PSC-17. Teachers rated the occurrence of stated behaviors (e.g., "Has trouble concentrating") in the classroom. Ratings were conducted approximately 8 weeks after the start of the academic year. PSC-17 ratings were obtained for 836 preschool-aged children. Most children were 4 years old at the time of the data collection period ($M$ = 4.65 years, $SD$ = 0.62). Female (49.8%) and male (50.2%) preschoolers were evenly distributed (420 boys and 416 girls). The sample of children rated by teachers was predominantly African American (36.8%) and White (37.1%), with other racial/ethnic groups present in smaller percentages (Hispanic, 6.8%; Other, including Mixed, Asian, American Indian, and Unknown, 19.3%). Most students received free/reduced lunch services (73.3%).

## *Statistical Analyses*

Because the PSC-17 uses a Likert-type response with only three categories, maximum likelihood estimation was not appropriate (Finney & DiStefano, 2013). CFA and ESEM analysis were conducted with Mplus (Version 7.2) using the weighted least square with mean and variance correction (WLSMV) for all analyses. This method is the default estimation method when categorical data are specified (Muthén & Muthén, 1998-2010).

*CFA.* A series of alternative models were tested, where models were suggested by prior research. First, the single-factor model and the three-factor model were tested (Blucker et al., 2014; Gardner et al., 1999; Stoppelbein et al., 2012). In addition, a bifactor model and a second-order factor model were examined. Both models have been tested with the BESS Teacher Rating Scale–Preschool version (Kamphaus & Reynolds, 2007), which also includes multiple dimensions and an overall score (DiStefano, Ene, & Leighton, 2015; DiStefano, Greer, & Kamphaus, 2013).

Bifactor models include a general factor which accounts for the commonality of all items and also specific factors that represent the unique influence of the factor on subsets of items. Each item is an indicator of both a general factor and a specific factor. In contrast, the second-order factor models assume the general factor (i.e., higher order factor) influences the specific factors (i.e., lower order factors). The higher order factor accounts for covariations among lower order factors in an alternative manner to correlated factor models (Gignac, 2008).

Besides the WLSMV-based chi-square value, four ad hoc fit indices were used to evaluate an optimal solution: normed chi-square (NC) statistic, comparative fit index (CFI), root mean square error of approximation (RMSEA), and the Tucker–Lewis index (TLI). The NC provides a ratio of the chi-square goodness-of-fit value to the model degrees of freedom, where a ratio of less than 3 indicates an acceptable model fit (Schermelleh-Engel, Moosbrugger, & Müller, 2003). The CFI value uses the "null" baseline; here, values of .95 or higher suggest good fit (Hu & Bentler, 1999). With RMSEA, a value of .06 or lower indicates adequate model fit. Finally, the TLI is a measure of relative model fit to the baseline model, and a value of .95 indicates acceptable fit. Modification indices were also examined, where values indicate the amount the overall chi-square value that would be reduced by adding a (nonincluded) path. Residual values show the difference between the observed and estimated covariances. Large standardized residuals (e.g., $|>4.0|$) suggest a large amount of variance remains, indicating a possible localized lack of fit.

*ESEM.* Following previous studies, factors were allowed to correlate (e.g., Gardner et al., 1999), requiring an oblique solution; however, both geomin and oblimin rotation methods were examined (e.g., Muthén & Muthén, 1998-2010). Because using eigenvalues above 1.0 might result in

**Table 1.** PSC-17 Model Fit Indices.

| Fit index | Unidimensional | Three factors/ higher order factor | Three factors/ higher order with cross-loadings | Bifactor | ESEM |
|---|---|---|---|---|---|
| *df* | 119 | 116 | 114 | 90 | 88 |
| Chi-square | 1,573.66** | 717.78** | 467.57** | 390.88** | 237.89** |
| NC | 13.24 | 6.19 | 4.10 | 3.95 | 2.70 |
| RMSEA [90% CI] | .12 [.12, .13] | .08 [.07, .08] | .06 [.06, .07] | .06 [.05, .06] | .05 [.04, .05] |
| CFI | .91 | .96 | .98 | .98 | .99 |
| TLI | .90 | .95 | .97 | .98 | .99 |

*Note.* PSC-17 = 17-item Pediatric Symptoms Checklist; ESEM = exploratory structural equation modeling; NC = normed chi-square; RMSEA = root mean square error of approximation; CI = confidence interval; CFI = comparative fit index; TLI = Tucker–Lewis index.
**$p < .0001$.

overestimation of the number of factors and subjectivity may arise in using a scree plot (Benson & Nasser, 1998), Velicer's minimum average partial (MAP) was also examined. The MAP examines the level of partial correlations after factors are extracted (Velicer, 1976), and researchers should retain the number of factors which minimize the average squared correlation.

Given ESEM is an exploratory procedure, the following criteria were considered. First, simple structure was desired, meaning that most items exhibited a meaningful loading (>.4) on one factor but low loadings (<.4) on other factors. Second, the final solution should have, at most, few cross-loading items for ease of interpretation. Cross-loadings were considered present if values were above .4 on more than one factor, or if loadings were lower, but distributed across factors with no clear marker variable. Factors with only one or two items were considered to be an indication of "over factoring" (Gorsuch, 1983). Finally, factor solutions were judged upon interpretability and match to the theoretical structure of the instrument. We note that the same fit information used with CFA is also available with ESEM. Thus, in addition to "traditional" rules of thumb used to evaluate exploratory models, fit indices may help identify an optimal solution.

## Results

### *Descriptive Information*

Frequency information for the PSC-17 items showed that most children received ratings of "Never" for a targeted behavior, yielding data which were nonnormally distributed in addition to categorical. A few items yielded ratings of "Often" for more than 20% of the sample (Items 4, 14, and 9). The three items measured children's Attention Problems: "Has trouble concentrating" (Item 14), "Distracted easily" (Item 9), and "Fidgety, unable to sit still" (Item 4). Researchers have suggested screening young children for Attention Problems before kindergarten (Zevenbergen & Ryan, 2010) to identify potential Attention Problems.

### *Statistical Analyses*

Model fit indices are presented in Table 1. Also, we recognize that both the higher order and three-factor models yielded the same fit, as these models contain the same number of estimated parameters and only differ in their theoretical orientation.

*CFA.* The unidimensional CFA model exhibited poor fit with all fit indices outside of recommended boundaries; thus, this model was not considered further. Both the three-factor and higher order

**Table 2.** PSC-17 Higher Order and ESEM Results: Standardized Loadings (*N* = 836).

| Items | Internalizing Problems | Attention Problems | Externalizing Problems |
|---|---|---|---|
| Feels sad, unhappy | **(.91*) .84*** | −.00 | .12* |
| Feels hopeless | **(.90*) .82*** | .02 | .13* |
| Is down on self | **(.93*) .80*** | −.04 | .23* |
| Seems to have less fun | **(.84*) .82*** | .02 | .04 |
| Worries a lot | **(.75*) .87*** | .02 | −.12* |
| Fidgety, unable to sit still | −.14* | **(.92*) .76*** | .32* |
| Daydreams too much | **(.43*) .49*** | **(.41*) .65*** | −.26* |
| Has trouble concentrating | .02 | **(.90*) .92*** | −.01 |
| Acts as if driven by a motor | −.07 | **(.88*) .68*** | .30* |
| Distracted easily | .08* | **(.94*) .87*** | .04 |
| Refuses to share | .12* | .08 | **(.89*) .79** |
| Does not understand other people's feelings | .30* | .27* | **(.87*) .45** |
| Fights with other children | .03 | .03 | **(.88*) .87** |
| Blames others for his or her troubles | .23* | .07 | **(.83*) .66** |
| Does not listen to rules | −.05 | **(.43*) .44*** | **(.50*) .57** |
| Teases other | .10* | −.01 | **(.86*) .85** |
| Take things that do not belong to him or her | .02 | .08 | **(.83*) .78** |
| Cronbach's α | .82 | .87 | .88 |
| Relation with higher order factor | **(.63)** | **(.80)** | **(.98)** |

*Note.* Parameter estimates for higher order solution are in parentheses; ESEM results are shown without parentheses. Factor correlations for ESEM solution: Attention Problems with Internalizing Problems, .44; Internalizing Problems with Externalizing Problems, .41; Externalizing Problems with Attention Problems, .62; Overall α = .91. PSC = Pediatric Symptoms Checklist; ESEM = exploratory structural equation modeling; Boldface values indicate Cronbach's α.
*Items significant at .05.

solutions yielded acceptable fit for CFI and TLI; however, other values were outside of suggested bounds. A closer investigation of the modification indices showed that fit would be greatly improved if two items were allowed to cross load ("Daydreams too much" with Attention Problems and Internalizing Problems; "Does not listen to rules" with Attention Problems and Externalizing Problems). These items were freed, as the associations also made sense theoretically. As shown in Table 2, releasing these two items yielded a significant improvement in all fit indices. Finally, the fit of the bifactor model was investigated. However, the bifactor model did not make sense. For example, when the general factor was included, two items on the Attention Problems factor yielded insignificant loadings and one item was negatively related to the factor. Furthermore, relations between the Internalizing Problems and Attention Problems factor were negative. Given that these findings were not in line with the theoretical underpinning of the PSC-17, the bifactor model was excluded.

Comparing both the three-factor and the higher order models, both exhibited good fit to the PSC-17 data set. While all loading values were significant, parameter values were slightly higher under the higher order model. Also, relations between the first-order factor and second-order factor were higher than the correlations among factors, with the second-order factor exhibiting the strongest association with the Externalizing Problems factor. After reviewing all of the available information, the higher order model was selected. Besides fitting theoretically, the model also aligns with the scoring pattern of the PSC-17, with an overall score representing "Maladaptive Behavior." Standardized parameter estimates are provided in Table 2.

*ESEM*. From the initial scree plot, variance added was minimal if more than three factors were included (i.e., 64% of variance accounted for with three factors); also, MAP results suggested that extracting three factors yielded the lowest squared correlation. Thus, three-factor solutions with different rotation methods were examined. The oblimin rotation solution was selected because (a) simple structure was generally observed, with only two cross-loading items; (b) factors contained more than five items per factor; and (c) the solution was easy to interpret and matched theory. As shown in Table 1, the ESEM solution yielded acceptable fit across all fit indices.

ESEM parameter estimates (i.e., values outside of parentheses) are provided in Table 2. As shown, factor correlations ranged from .44 to .62 and were of expected magnitude and direction. All loading parameters were significant and, interestingly, were equivalent (to two digits) to the higher order results. Compared with the higher order model, the ESEM analyses exhibited slightly better higher relative fit; however, we recognize that more parameters are estimated under an exploratory framework than the CFA framework.

## Discussion

The focus of this study was to investigate the underlying structure of the PSC-17 to determine whether the theoretical structure holds for preschool-aged students. Using a sample of more than 800 teacher ratings, investigations with CFA and ESEM were conducted and compared. Investigations showed initial support for the scale's underlying multifactor structure with teacher raters. Researchers and school personnel may have greater comfort knowing that the scales were identified and matched underlying theory.

Comparing CFA and ESEM, items are loaded on the same factors, and at similar magnitudes, across the two methods. The concordance illustrates that the constructs measured by the PSC would be identified regardless of method used. Furthermore, fit information illustrated yielded good fit across techniques. Wiesner and Schanding (2013) found similar results in investigations of CFA and ESEM with the BESS Child/Adolescent form. The authors mentioned minor differences between methods and stated that the optimal model may need to be determined based on theoretical and conceptual evidence rather than statistical evidence alone.

The two cross-loading items were identified with both CFA and ESEM analysis. These two items may have theoretical support for including cross-loadings in future analyses. For example, the item "Daydreams too much" from the Attention Problems scale is also associated with the Internalizing Problems scale. Young children with emerging internalizing or withdrawal tendencies are likely to be less social than their peers and engage more in solitary play (e.g., Rubin, Hymel, & Mills, 1989; Spinrad et al., 2004). The children who may be considered "daydreaming," or "unfocused," could be viewed as withdrawn due to coping techniques (e.g., social anxiety), rather than inattention (Rubin et al., 1989). In addition, the Externalizing Problems item "Does not listen to rules" is also associated strongly with the Attention Problems scale. This is unsurprising, considering the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013) criteria for Attention-Deficit/Hyperactivity Disorder includes measures of "often does not seem to listen when spoken to directly" and "often does not follow through on instructions."

The optimal CFA model identified also provides advantages. The higher order structure aligns well with the overall theoretical perspective and scoring plan used with the PSC-17, that is, consisting of an overall score and separate dimension scores. A higher order model has been found to be optimal for other social/emotional screening tools used in the school environment with similar scoring recommendations (e.g., You et al., 2014). Comparing both ESEM and higher order solutions, initial evidence suggests that the higher order solution may be preferred due to its alignment with the theoretical structure of the PSC-17, the scoring mechanism, and larger parameter estimates.

### *Study Limitations and Avenues for Future Study*

Limitations exist with the present study. While a large data set was used, both EFA and CFA were conducted on the same data set, which may promote capitalization of chance findings (Kline, 2010). Ideally, independent samples would be used for each set of analyses. In addition, we recognize that the sample was collected from one state and during one time period (fall of 2012). While preschoolers were collected from different schools and school districts within the state, we recognize that there may be biases due to demographic characteristics (e.g., location, poverty levels, ethnic/racial makeup) within the sample.

We also recognize that an optimal structure including cross-loading items may be problematic, as simple structure is often preferred for simplicity (Gorsuch, 1983). Given the substantial size of the loading values on multiple factors as well as the match of cross-loading items to theory, these items were included. There is a need for replication to determine whether cross-loading items can be identified in an independent sample of teacher ratings, as well as for other age groups. Additional study may also investigate the impact of including cross-loading on creating subscale scores as well as with validity evidence, such as relationships between PSC-17 scores and academic measures.

Another limitation is that differences were not investigated by age, ethnicity/race, or gender to determine whether there may be discrepancies in reporting due to child characteristics. Many published instruments undergo investigations to ensure that selected items do not exhibit bias due to extraneous factors (i.e., differential item functioning) and across subgroups to ensure that scores are not consistently higher (or lower) for one subgroup of the population. To ensure the PSC-17 works appropriately with different subgroups, invariance testing may determine how ratings differ among important subgroups. For example, gender, age, and race were found to be differentially related to the underlying constructs of the BESS Teacher Rating Scale–Preschool form (DiStefano et al., 2015). A more detailed study of item and/or group differences is warranted for a better understanding of the PSC-17 within the school environment.

Furthermore, while the website provides information about the PSC-17 scale, limited information about the screener's development is present (e.g., Gardner et al., 1999), and authors note that validity associated with the cut-scores has not yet been established. Whereas this study is an initial investigation of the PSC-17's underlying structure with teacher raters, examination of cut-scores is recommended for future study, to ensure that the recommended levels function acceptably. Analyses could be conducted as part of a series of validation studies, where researchers examine stated (as well as alternative) cut-scores and relationships with outcome variables. Such study will help provide confidence the PSC-17 identifies children at risk for social/emotional problems.

In sum, the PSC-17 may be a viable option for schools interested in preschool-aged behavioral/emotional screening as part of an MTSS framework or for supporting students and school professionals (e.g., counselors, administrators, school psychologists, teachers). The form is similar in item content and dimensional structure as existing teacher rating scales; however, additional advantages are the form consists of only 17 items and is freely distributed. As symptoms of emotional or behavioral problems are often present by age 3 (Kazdin, 1987), timely intervention and assistance with preschoolers may curtail behavioral and emotional problems early, allowing greater opportunity for success in the school environment.

### Authors' Note

The opinions expressed are those of the authors and do not necessarily represent views of the Institute of Education Sciences or the U.S. Department of Education.

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