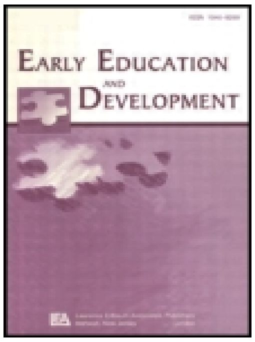

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Exploring the Underlying Factor Structure of the Parent Reading Belief Inventory (PRBI): Some Caveats

Jorge E. Gonzalez
Department of Educational Psychology, Texas A&M University

Aaron B. Taylor
Department of Psychology, Texas A&M University

Matthew J. Davis
Department of Educational Psychology, Texas A&M University

Minjung Kim
Department of Educational Administration and Human Resources, Texas A&M University

Research Findings: The present study explored the underlying factor structure proposed a priori by the developer of the Parent Reading Belief Inventory (PRBI: B. D. DeBaryshe, 1995) using a local independent sample. The PRBI was developed to assess maternal beliefs about reading aloud to children and was designed to measure attitudes, perceptions, and values about how children learn, the content of what they learn, as well as parental teaching efficacy. The PRBI is purported to have 7 underlying subscales and a total score. Analyses showed internal consistency estimates that were similar to those reported by the authors of the PRBI. Using confirmatory factor analysis, we found good fit for only 2 of the 7 dimensions (Reading Instruction and Resources) and poor fit for overall models for the entire PRBI scale when modeled using a 2nd-order factor, correlated factors, or a single general factor. *Practice or Policy:* Limitations and future research are discussed.

INTRODUCTION

Parents' literacy beliefs can vary substantially and can significantly influence the literacy learning potential of the home environment (Curenton & Justice, 2008; Wasik & Hendrickson, 2004). Literacy beliefs are thought to manifest in the home literacy environments (HLEs) and behaviors that parents make available that engage children in opportunities for literacy development (Burgess, Hecht, & Lonigan, 2002). The assumption is that individual differences in parent literacy beliefs have real consequences for what children learn and do (DeBaryshe, Binder, & Buell, 2000; Wasik & Hendrickson, 2004). One option for researchers interested in assessing

Correspondence regarding this article should be addressed to Jorge E. Gonzalez, 4225 Department of Educational Psychology, College of Education and Human Development, Texas A&M University, College Station, TX 44843-4255. E-mail: jegonzalez@tamu.edu

parents' literacy beliefs is the Parent Reading Belief Inventory (PRBI; DeBaryshe, 1995). The purpose of the present study was to use a local sample to evaluate how the underlying beliefs measured by the PRBI reflect the a priori dimensions proposed by the inventory's developer.

The importance of parental literacy beliefs rests on the fact that the HLE is the setting in which children first encounter adult-mediated language and literacy experiences (Weigel, Martin, & Bennett, 2006a,b) that presage the development of conventional literacy skills. The research suggests that literacy beliefs, practices, and activities in the more immediate environments of home and community relate to children's literacy development (Gunn, Simmons, & Kameenui, 1998). Understanding parental literacy beliefs is of particular interest because of the prevailing presumption that exposing children to an HLE rich in literacy practices is beneficial to their development (Burgess, Hecht, & Lonigan, 2002) and, in turn, may provide an indication of a child's degree of risk for reading and other problems (Snow et al., 1998).

Although models of the HLE vary, and no definition of this construct has been widely used, the importance of the HLE for children's development is no longer disputed (Payne, Whitehurst, & Angell, 1994). However, few tools with reported score reliability are available for measuring the HLE. And to our knowledge, virtually no instrument fully addresses parental reading beliefs. It is clear from the growing body of research on the HLE (see studies by Burgess et al., 2002; Weigel et al., 2006) that there is a clear need for researchers to build a scientific base for practice and policy that recognizes the wide range of literacy beliefs and practices that families display as they participate in literacy practices with children.

Beliefs are generally defined as the psychological acceptance of and conviction in the truth or probable truth of some statement or some phenomenon's reality (Weigel, Martin, & Bennett, 2006a). Parent beliefs ''are presumed causative factors influencing the course of children's development'' vis-à-vis childrearing practices (Sigel & McGillicuddy-De Lisi, 2002, p. 486). Concerning parental beliefs about literacy, Sigel and McGillicuddy-De Lisi (2002) argued that beliefs evolve, and modes of their expression arise, from personal histories, cultural norms, and parent–child interactions and are expressed as an identifiable act or actions. Investigations of parental beliefs about literacy have largely been driven by assumptions that the environments parents provide, parenting practices, and parent–child interactions are the most direct manifestation of those beliefs (DeBaryshe, 1995; Weigel et al., 2006b).

The PRBI was developed to assess parents' (usually mothers') beliefs about reading aloud to their children. It is designed to measure maternal attitudes, perceptions, and values about how children learn and the content of what they learn, as well as the mother's own teaching efficacy. In the initial 1995 study to test a model of determinants and outcomes of parent–child read-alouds, DeBaryshe found a strong link between specific beliefs (e.g., parent literacy beliefs) and behaviors (e.g., reading socialization practices). Specifically, DeBaryshe found that beliefs, as measured by the total score on the PRBI, were strongly predictive of children's exposure to maternal joint-reading interactions and children's interest in books.

Other studies have used the PRBI total score to examine the relationship between parental beliefs and child outcomes, presumably because parental beliefs are thought to influence children's development in areas such as achievement. With a predominantly Caucasian middle-class sample, Weigel, Martin, and Bennett (2005) found that preschool children's print knowledge and receptive and expressive vocabulary were consistently and robustly associated with the generalized maternal literacy beliefs total score. More important, after autoregressive effects were controlled, maternal beliefs continued to be associated with print knowledge and expressive and receptive language 1 year later. Using what appears to be the same sample as in the 2005 study, Weigel and colleagues (2006a) also used cluster analysis to identify two PRBI maternal literacy belief profiles, Facilitative and Conventional. Logistic regression showed that Facilitative mothers possessed more literacy-enriched homes and that their children displayed more advanced print knowledge skills and reading interest.

In a related path analysis study also using the same data, Weigel et al. (2006b) found that parental literacy habits were positively related to parental beliefs, that beliefs were subsequently related to facilitative parent–child activities, and that parent–child activities was positively related to print knowledge and reading interest. Similarly, Curenton and Justice (2008), using a sample of low-income Caucasian Appalachian families, found that maternal beliefs about reading aloud, as measured by the total score on the PRBI, mediated the association between the maternal education and preliteracy skills of preschool children. Gonzalez, Rivera, Davis, and Taylor (2010), using a sample of primarily Latino and African American families, found that more educated mothers provided more enriched HLEs. Furthermore, the more enriched the HLE, the more positively affected were maternal facilitative reading beliefs on the PRBI, and ultimately more facilitative beliefs were related to higher child expressive vocabulary scores. Finally, using a PRBI translated into Mandarin Chinese with well-educated middle-class Taiwanese mothers, Wu and Honig (2010) found that parental composite score reading beliefs were highly correlated with family income, maternal education, as well as maternal and child literacy-related practices. No relationships were found with independent subscales of the PRBI, however. These studies demonstrate, in part, that maternal beliefs about reading can shed some light on or account for some of the association between maternal education or the HLE and children's early literacy skills.

To our knowledge, however, there is little information to substantiate the multidimensional constructs underlying the PRBI. The only available published study attempting to replicate the DeBaryshe and Binder (1994) factor structure is a recent study by Wu and Honig (2010). Using a sample of Taiwanese mothers, Wu and Honig conducted a principal component analysis using varimax rotation and found support for eight first-order factors: Knowledge-Gains From Reading Storybook ($\alpha = .90$), Affect-Negative ($\alpha = .80$), Verbal Participation-Reading Techniques ($\alpha = .83$), Efficacy 1-Parental Role in General ($\alpha = .69$), Affect Positive ($\alpha = .63$), Efficacy 2 Parent role before school ($\alpha = .62$), Environment Input-Genetic ($\alpha = .45$), Reading Instruction-Teaching Before School ($\alpha = .65$). A total of 32 items were retained in the eight factors. For each of the eight factors, a subscale score was calculated using the items belonging to the factor. A second-order principal components analysis was then used to determine whether the eight factors represented a second-order factor as is suggested by the use of a single score to represent parental beliefs. From the second-order analysis, the authors found support for two higher order factors rather than one. Factor 1 (41.6% of the variance) consisted of five of the original eight subscales: Knowledge Participation, Positive Affect, Efficacy for Parental Role in General, and Reading Instruction. Factor 2 (13.1% of the variance) consisted of Efficacy for Parental Role Prior to School and Environment Input. The Negative Affect subscale was dropped because it cross-loaded on both higher order factors. Because the first second-order factor accounted for so much more variance than the second, the authors concluded that the five factors loading on the first second-order factor best represented parental beliefs. A total of 24 items were retained to measure these five factors.

Although the Wu and Honig (2010) study provides important information, particularly about the cross-cultural application of the PRBI, it suffers from a number of methodological weaknesses that the present study attempts to correct. First, the study did not attempt to validate the proposed structure of the PRBI with its seven subscales, a task best undertaken using confirmatory factor analysis (CFA). Second, the study used principal component analysis as an exploratory method rather than factor analysis (Gorsuch, 1990). Factor analysis is preferred because it does not include the unique variability in each item in its solution. Third, the decision about how many factors to retain appears to have been based on the eigenvalues greater than 1 criterion, an approach that typically leads to retaining too many factors (Horn, 1965). Fourth, solutions were rotated using varimax, an orthogonal rotation method. This choice ignores the associations among the factors that would be expected given that the items are all designed to measure a single construct. An oblique rotation would be preferred (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Finally, the second-order factor solutions were arrived at by first calculating subscale scores and then performing principal component analysis on these scores. Although this approach has the virtue of not requiring CFA, its major drawback is that it necessarily ignores the possibility that any of the items associated with the subscales might cross-load on other subscales.

The purpose of the present study was to use CFA to determine how the dimensions measured by the PRBI (DeBaryshe, 1995) reflect the a priori dimensions proposed by the developer. The authors of the PRBI report on seven subscales of the PRBI that are purported to assess parental perceptions of (a) teaching efficacy (e.g., ''I am my child's most important teacher''), (b) positive affect (e.g., ''Reading with my child is a special time that we love to share''), (c) verbal participation (e.g., ''When we read, I want my child to help me tell the story''), (d) reading instruction (e.g., ''When we read, I have my child point out different letters or numbers that are printed in the book''), (e) knowledge base (e.g., ''Reading helps children learn about things they never see in real life like Eskimos and polar bears''), (f) resources (e.g., ''I don't read to my child because we have nothing to read''), and (g) environmental input (e.g., ''Some children are natural talkers, others are silent. Parents do not have much influence over this''). Parent responses are based on a 4-point Likert-type scale ranging from 1 = *strongly disagree* to 4 = *strongly agree*. Higher scores indicate more positive and facilitative attitudes toward the efficacy of reading aloud with preschool children as a tool for language development. Although the subscales of the PRBI may be useful in research, the argument that seven subscales can be identified as distinct dimensions of the PRBI has not been empirically validated in the literature. Furthermore, most researchers rely on a single total score for the PRBI (e.g., Curenton & Justice, 2008; DeBaryshe, 1995); thus, we also propose to test the appropriateness of this total score through CFA.

METHODS

Participants

The current study was part of a larger federally funded project assessing the effects of an intensive shared-reading intervention for preschool children at risk for oral language delays. Participants were children enrolled in two school districts and one regional Head Start agency in two ethnically diverse cities in south central Texas. Of the original 209 children available to participate in the study, parents of 148 children consented to fill out the PRBI at pretest. Of the larger sample, 136 parents actually completed the PRBI. Of these parents, 99 spoke primarily English, with the remaining parents filling out a Spanish translation of the instrument. Participating children had a mean age 4.55 years ($SD = 0.32$ years, range = 4–5.25 years). Of these children, 37 were listed as English language learners, 3 were listed as needing special education services (of these three, two had speech or language impairment and one had visual impairment), 2 received speech/language services, 6 received English as a second language services, and 4 received other services.

The majority of participating parents self-identified as Hispanic (48.9%) or African American (31.6%), with 15% identifying as White, 3% Asian, and 1.5% other. Most families spoke English as the primary home language (64.3%). Moreover, 91% of the families were intact (both mother and father present). Families' median reported number of children was two. Details for the mothers' education level showed that 5 had reached eighth grade or less, 18 had reached Grades 9–11, 28 had achieved high school graduation or a general equivalency diploma, 34 had had some college, and 14 had a college degree. Details for the fathers' level of education showed that 6 had reached eighth grade or less, 19 had reached Grades 9–11, 32 had achieved high school graduation or a general equivalency diploma, 16 had had some college, and 16 had a college degree. All children of participating parents were eligible for free or reduced-cost lunch, and most families (75.6%) had an annual income of less than $24,000.

Measures

The PRBI is a 42-item untimed measure of maternal beliefs about reading aloud to preschool-age children, what and how often mothers read to their children, and mothers' self-efficacy as their child's teacher. Although the authors of the PRBI report that the PRBI has seven subscales, they also state that the items form a single factor and can be used as a total score. Furthermore, most researchers use the total score of the PRBI in analyses as both an outcome and predictor variable (e.g., Curenton & Justice, 2008; DeBaryshe, 1995). Total scores on the PRBI can range from 42 to 168.

DeBaryshe and Binder (1994) report a range of alpha reliability coefficients for the PRBI subscales from .50 to .85 (see Table 1). The authors do not report an alpha coefficient for the

TABLE 1
Internal Consistency Estimates for the Parent Reading Belief Inventory by Subscale

Scale	*DeBaryshe & Binder (1994)*	*Current Study*
Teaching Efficacy	.73	.68
Positive Affect	.85	.77
Verbal Participation	.83	.83
Reading Instruction	.63	.73
Knowledge Base	.82	.80
Resources	.79	.80
Environmental Input	.50	.72
Total Score		.92

total PRBI; however, they do report a 2-week test–retest reliability coefficient of .79 for the total score. In their studies, Curenton and Justice (2008) and Gonzalez et al. (2010) reported coefficient alphas of .85 and .90, respectively, for the total score. See the Appendix for the instrument and underlying subscales and items.

The PRBI was sent home by participating teachers to individual parents via a participating child's backpack. In the event a parent was unable to fill out the form, whenever possible, parents were contacted by teachers or a teacher's aid for assistance in filling out the form. Although the scale was translated into Spanish, to avoid any possible problems of failure of invariance of the scale or subscales across language, all analyses were performed using only the 99 parents who responded to the original English version of the scale.

Data Analysis

Model specification. A series of CFA models were estimated, first in order to examine the factor structure of the seven subscales underlying the PRBI and second to validate the single-factor structure reported for the entire instrument. The models for the individual subscales each treated that subscale as a single factor and used the individual items of the PRBI as indicators of that factor. No model was estimated for the Environmental Input subscale because it

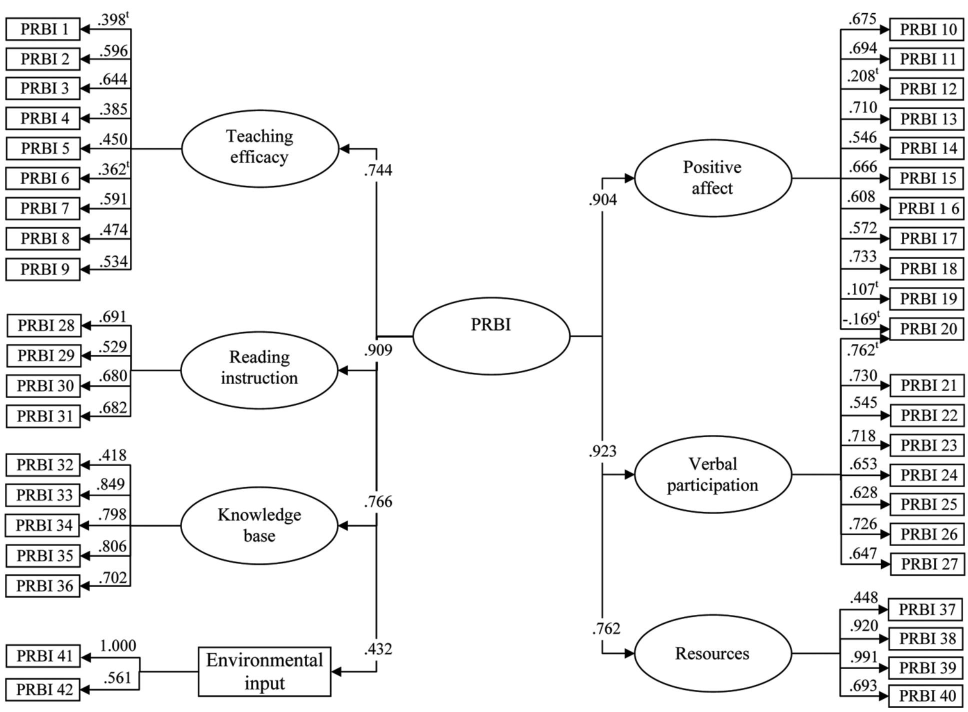

FIGURE 1 Model of confirmatory factor analysis with standardized factor loadings. All loadings are statistically significant at $p < .01$ unless noted. Residuals are omitted to simplify the presentation. PRBI = Parent Reading Belief Inventory. $^{t}p > .01$.

has only two items. Three alternative models were estimated for the entire scale. In the first model, the seven subscales were each estimated as separate factors, and a second-order factor was estimated with the subscale factors as indicators (see Figure 1). This model was chosen because it appeared most in line with the theoretical underpinnings of the scale: Parental reading beliefs is seen as a single general factor underlying the specific beliefs and attitudes measured by the subscales. The second model also treated each subscale as a separate factor, but rather than including a second-order factor, it simply allowed the subscale factors to correlate. This model was used to check whether any potential misfit in the second-order factor model was due to the constraints introduced by the second-order factor alone or whether misfit was present also in the definition of the subscales as separate factors. The third model had all 42 items load on a single general factor. Its purpose was to check the validity of computing a total scale score for the entire PRBI scale. The fit of the confirmatory factor models was assessed using the chi-square likelihood ratio test, the comparative fit index (CFI; Bentler, 1990), and the standardized root-mean-square residual (SRMR; Benter, 1995). Cutoff values of the fit indices indicating acceptable fit were CFI $\geq$.95 and SRMR $\leq$.08 (Hu & Bentler, 1999). All models were estimated using Mplus 6.0 (Muthén & Muthén, 2007). Less than 5% of data were missing, but in order to get maximum utility from the data, full information maximum likelihood was used so that cases in which values were missing could be included. Because the items had only four response options and therefore could not be normally distributed, we used the Mplus MLR estimator to estimate the models, which is asymptotically equivalent to using the Yuan-Bentler adjustment for non-normality (Yuan & Bentler, 2000). Cronbach's alpha values were calculated using SPSS 16.0 (SPSS, 2007).

RESULTS

Table 1 presents the internal consistency estimates of the PRBI obtained in the current study. Alpha coefficients were calculated for each subscale. Table 1 also presents the original alpha coefficients reported by DeBaryshe and Binder (1994). Findings showed that alphas for the current total sample ranged from .68 to .83 and were comparable to the original values reported by the authors of the PRBI. Table 2 presents the correlation matrix for the items.

Table 3 presents fit statistics for both models for individual subscales and for the three overall models. The CFA results for the subscales showed substantial variance in how well they fit. The Resources and Reading Instruction subscales fit quite well. The Knowledge Base, Verbal Participation, and Positive Affect subscales fit less well. Finally, the Teaching Efficacy subscale fit very poorly. Fit indices were not unequivocal for these subscales, with CFI indicating worse fit than SRMR. CFI likely indicated worse fit because of generally low correlations among the items (see Table 2), which made the null models (which allow for no correlations among variables and which are the standard of comparison in CFI) fit better than they do in most CFA circumstances.

Figure 1 shows standardized factor loadings for the overall second-order factor model of the entire PRBI, with subscales treated as first-order factors. As shown in Table 3, this model fit quite poorly, $\chi^2(812) = 1{,}480$, $p < .001$, CFI =.638, SRMR = .100. The correlated factors model also fit poorly, as did the single-factor model in which all 42 items loaded on a single general factor. These results suggest that, even given the fair to good fit of some of the subscales, the

TABLE 2
Correlation Matrix for Parent Reading Belief Inventory Items

Item	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
1	—																				
2	**.073**	—																			
3	**.329**	**.461**	—																		
4	**.186**	**.225**	**.314**	—																	
5	**.100**	**.178**	**.265**	**.130**	—																
6	**−.058**	**.292**	**.198**	**.123**	**.145**	—															
7	**.602**	**.185**	**.521**	**.127**	**.229**	**.075**	—														
8	**−.050**	**.483**	**.230**	**.178**	**.269**	**.382**	**.137**	—													
9	**.162**	**.453**	**.178**	**.076**	**.286**	**.125**	**.364**	**.335**	—												
10	.140	.280	.358	.335	.123	.200	.291	.188	.250	—											
11	.235	.497	.297	.285	.250	.272	.310	.344	.465	**.569**	—										
12	.118	−.107	−.112	.128	−.020	.027	.130	−.091	.095	**.192**	**.182**	—									
13	.392	.077	.239	.227	.301	.203	.378	.055	.189	**.605**	**.428**	**.310**	—								
14	.297	.161	.139	.184	.086	.148	.235	.087	.173	**.312**	**.348**	**.179**	**.414**	—							
15	.065	.184	.317	.301	.350	.351	.262	.245	.256	**.390**	**.376**	**.068**	**.527**	**.340**	—						
16	.185	.368	.218	.162	.221	.407	.227	.473	.372	**.328**	**.541**	**.117**	**.302**	**.321**	**.368**	—					
17	.405	.331	.443	.163	.251	.042	.490	.039	.415	**.351**	**.449**	**.141**	**.468**	**.354**	**.456**	**.239**	—				
18	.235	.076	.171	.271	.265	.245	.267	.115	.158	**.537**	**.429**	**.141**	**.526**	**.463**	**.465**	**.582**	**.262**	—			
19	.118	.126	.107	.134	−.113	.046	.008	−.054	.006	**.136**	**.082**	**.072**	**.130**	**−.022**	**−.008**	**.061**	**.082**	**.118**	—		
20	.209	.202	.346	.210	.213	.232	.289	.144	.233	**.262**	**.245**	**−.025**	**.241**	**.230**	**.386**	**.296**	**.489**	**.257**	**.022**	—	
21	.119	.188	.290	.036	.372	.234	.317	.147	.228	.347	.332	.111	.416	.252	.572	.261	.492	.357	−.011	**.573**	—

Item	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
22	.148	.054	.204	.049	.221	.102	.353	.029	.303	.181	.199	.064	.264	.128	.381	.153	.432	.370	.095	**.368**	**.555**
23	.174	.364	.306	.059	.193	.097	.328	.280	.388	.375	.524	.147	.399	.355	.364	.375	.452	.389	.039	**.405**	**.481**
24	.112	.224	.201	.219	.141	.194	.269	.255	.291	.413	.393	.193	.420	.366	.361	.369	.292	.348	−.098	**.334**	**.456**
25	.115	.114	.146	.136	.229	.187	.177	.176	.131	.268	.306	.102	.380	.262	.458	.395	.301	.397	−.113	**.299**	**.500**
26	.196	.189	.227	.209	.203	.207	.274	.132	.310	.318	.347	.031	.412	.480	.531	.444	.466	.466	.117	**.477**	**.464**
27	.151	.115	.165	.207	.193	.144	.245	.145	.180	.432	.376	.096	.483	.313	.379	.456	.247	.429	.099	**.290**	**.411**
28	.128	.201	.177	.313	.216	.112	.229	.209	.202	.455	.326	.134	.502	.367	.528	.305	.258	.424	.146	.209	.380
29	−.030	.098	.001	.155	.170	−.006	.066	.092	.298	.288	.133	.178	.283	.240	.255	.146	.243	.250	−.152	.274	.344
30	.278	.274	.314	.206	.299	.200	.316	.187	.299	.450	.408	−.002	.450	.238	.357	.489	.344	.541	.034	.400	.461

31	.266	.296	.324	.192	.131	−.058	.254	.130	.224	.445	.355	.048	.417	.416	.396	.388	.348	.449	.159	.239	.313
32	.179	.077	.093	.068	.270	−.070	.215	.088	.282	.200	.161	.159	.322	.282	.291	.238	.396	.220	.011	.187	.298
33	.228	.229	.324	.170	.310	.177	.304	.151	.215	.296	.302	.018	.321	.332	.521	.251	.469	.318	.113	.583	.649
34	.124	.170	.204	.101	.292	.117	.214	.204	.295	.293	.180	.091	.288	.259	.413	.260	.382	.360	.003	.449	.508
35	.240	.081	.211	.026	.250	.091	.284	.192	.293	.257	.285	−.031	.371	.292	.456	.206	.350	.381	−.039	.484	.577
36	.258	.045	.285	−.012	.270	.151	.333	.121	.250	.179	.155	.060	.284	.257	.344	.106	.409	.254	−.067	.400	.560
37	.088	.230	.308	.271	.158	.227	.247	.279	.280	.568	.325	.241	.410	.292	.456	.533	.353	.472	.163	.246	.370
38	.442	.330	.497	.236	.303	.185	.543	.195	.119	.400	.489	−.034	.449	.345	.415	.364	.514	.463	.089	.443	.468
39	.328	.375	.478	.252	.328	.266	.409	.325	.219	.411	.441	−.083	.432	.384	.473	.468	.516	.509	.099	.503	.486
40	.334	.423	.399	.208	.297	.301	.342	.289	.185	.184	.255	−.115	.221	.199	.244	.374	.333	.224	.132	.345	.261
41	.191	.216	.197	.170	.115	.185	.179	.200	.066	.140	.169	.013	.246	.347	.305	.294	.239	.253	.039	.284	.255
42	.124	.123	.134	.057	−.030	.140	.154	.221	−.097	−.047	−.012	−.146	−.071	.074	.043	.110	.011	.014	−.210	.179	.078

Item	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*	*33*	*34*	*35*	*36*	*37*	*38*	*39*	*40*	*41*	*42*
22	—																				
23	**.464**	—																			
24	**.346**	**.562**	—																		
25	**.296**	**.426**	**.503**	—																	
26	**.479**	**.479**	**.469**	**.549**	—																
27	**.230**	**.460**	**.430**	**.574**	**.620**	—															
28	.324	.432	.448	.366	.488	.518	—														
29	.210	.262	.400	.289	.305	.343	**.383**	—													
30	.243	.339	.332	.293	.422	.482	**.376**	**.444**	—												
31	.178	.521	.415	.394	.483	.444	**.563**	**.400**	**.407**	—											
32	.279	.425	.224	.258	.286	.299	.411	.260	.175	.488	—										
33	.397	.549	.279	.468	.528	.384	.349	.337	.384	.448	**.401**	—									
34	.434	.647	.270	.414	.447	.360	.382	.305	.299	.351	**.485**	**.720**	—								
35	.495	.590	.359	.381	.537	.401	.339	.297	.418	.352	**.254**	**.679**	**.620**	—							
36	.393	.290	.265	.249	.393	.289	.198	.228	.379	.227	**.245**	**.531**	**.527**	**.698**	—						
37	.294	.501	.456	.427	.435	.471	.538	.264	.414	.608	.480	.366	.441	.260	.228	—					
38	.306	.465	.391	.264	.324	.361	.437	.125	.536	.436	.250	.466	.345	.381	.369	**.362**	—				
39	.281	.463	.388	.288	.371	.387	.447	.172	.592	.447	.257	.474	.428	.392	.387	**.429**	**.911**	—			
40	.101	.272	.265	.241	.242	.311	.282	.030	.474	.325	.240	.370	.257	.223	.225	**.374**	**.606**	**.685**	—		
41	.076	.349	.211	.222	.326	.409	.201	.096	.289	.297	.219	.330	.382	.274	.319	.374	.381	.415	.288	—	
42	−.007	.059	−.131	.027	.042	.144	−.119	−.073	.118	.013	−.072	.115	.075	.066	.059	.100	.220	.224	.209	**.563**	—

Note. Correlations for items in the same subscale are bolded.

TABLE 3
Fit Statistics for Confirmatory Factor Analysis Models

Model	χ^2 *(df)*	*p*	*CFI*	*SRMR*
	Individual subscale models			
Teaching Efficacy	132.85 (27)	<.001	0.238	.116
Positive Affect	79.92 (44)	<.001	0.819	.069
Verbal Participation	42.03 (20)	.003	0.867	.069
Reading Instruction	3.82 (3)	.282	0.984	.047
Knowledge Base	18.55 (5)	.002	0.886	.054
Resources[a]	0.63 (3)	.889	1.000	.024
	Overall models			
Second-order factor	1,480.43 (812)	<.001	0.638	.100
Correlated factors	1,455.26 (798)	<.001	0.644	.096
Single factor	1,706.25 (819)	<.001	0.519	.098

Note. Environmental input has only two items, so a confirmatory factor analysis could not be tested for it. CFI = comparative fit index; SRMR = standardized root-mean-square residual.

[a]The estimation of this model resulted in a negative estimated residual variance for Item 39, so the residual was fixed to zero.

constraint that items not be allowed to cross-load onto different subscales imposed in the overall models was not compatible with the data.

The poor fit of the overall models may be questioned given the small sample size. Certainly the number of cases per parameter estimate was smaller than any commonly proposed cutoff. In order to respond to this concern, we estimated a series of submodels from the overall correlated factors model in order to examine their fit in comparison to the fit of the overall model. Submodels were used because they were small enough (i.e., had far more cases per parameter estimate than the overall models) that the small sample size would be less of a concern in interpreting their results. If small submodels fit well, but larger ones fit noticeably worse, this would suggest that the small sample size affected fit for the overall models. If, however, even small submodels fit poorly, and fit only gradually declined with the increasing size of the model, this would suggest that the poor fit of the overall models was *not* a result of the small sample size.[1] Submodels were constructed by combining two or more models for individual subscales and allowing factors for the subscales to correlate. All possible submodels including all possible subsets of the seven subscales were estimated. For example, there are 21 possible ways to choose two of the seven subscales, so all 21 of these models were estimated (although one did not achieve convergence). These included Teaching Efficacy with Positive Affect, Teaching Efficacy with Verbal Participation, and so forth until the last two-factor submodel, Resources with Environmental Input. Similarly, all possible submodels using three of the seven subscales were estimated, as were all possible

[1]We are not aware of this method having been described before in the literature. It is, however, roughly analogous to the approach often used in structural equation modeling of testing the measurement and structural models sequentially, allowing for sources of misfit to be more precisely located (Anderson & Gerbing, 1988). The primary difference between our approach and the Anderson and Gerbing (1988) approach is that our approach builds the model up by adding variables to the model, whereas the Anderson and Gerbing approach includes all variables from the beginning but builds the model up by adding parameter constraints.

TABLE 4
Fit Statistics for Correlated Factors Submodels Including Different Numbers of Subscales

		χ^2 *p*		*CFI*		*SRMR*	
No. of Subscales	*No. of Submodels*	*Median*	*% ≥ .05*	*Median*	*% ≥ .95*	*Median*	*% ≤ .08*
1	6	.003	33	.877	33	.062	83
2	20[a]	< .001	5	.822	5	.081	50
3	35	<.001	0	.783	0	.091	26
4	34[b]	<.001	0	.764	0	.093	6
5	21	<.001	0	.731	0	.094	0
6	7	<.001	0	.656	0	.095	0
7	1	<.001	0	.644	0	.096	0

Note. Items 39 and 41 were estimated to have negative residual variances in some submodels; all such models were reestimated with the items' residual variances fixed to zero. CFI = comparative fit index; SRMR = standardized root-mean-square residual.

[a]The submodel including Reading Instruction and Environmental Input was empirically underidentified and could not be estimated.

[b]The submodel including Teaching Efficacy, Positive Affect, Reading Instruction, and Environmental Input was empirically underidentified and could not be estimated.

submodels using four, five, or six of the seven subscales. Finally, the one model that used all seven subscales was discussed previously as the overall correlated factors model.

Fit statistics for the submodels are summarized in Table 4. In general, fit got worse as the size of the submodel increased. This was to be expected, as the addition of more items and factors to the model meant adding more potential situations of an item being constrained to load only on its assigned factor when it might otherwise cross-load on another factor, either instead of or in addition to its assigned one. The declines in fit were fairly gradual as the submodel size increased, though. For example, the median SRMR for three-factor submodels was .091, very near its value for the overall model, .096. The fit of even the smallest submodels was also generally poor: Only half of the two-factor submodels fit well by the SRMR standard, and only 5% (1 of 20) fit by the CFI standard. These results for gradual decline in fit with increasing model size and poor fit in even small submodels suggest that the poor fit of the overall models was not a result of the small sample size.

A common follow-up analysis to a failure to confirm a proposed model is an exploratory factor analysis. Such a model attempts to find factors that account for relations among items without imposing a model other than the number of factors. An exploratory factor analysis yielded uninterpretable results, however, with unrelated items in many cases loading together on the same factor. This outcome was likely related to the small sample size. As the results of this analysis may be misleading, we do not present them here.

DISCUSSION

In this study we investigated the factor structure of the PRBI, a measure of maternal beliefs about reading aloud to children. Specifically, we tested the measure to confirm the a priori factor structure of the subscales and total score proposed by the authors of the PRBI (DeBaryshe & Binder, 1994). The current study found internal consistency estimates that were similar to those reported by the authors of the PRBI. However, our findings also showed that, although two of the individual subscales fit a single-factor model well, the fit of the models that included all of the subscales together was quite poor. This was likely a result of the subscales not being sufficiently distinct. The overall models required items to load on only their associated subscale factors, but, as evidenced by the poor fit, many of the items should have loaded on two or more of the subscale factors.

Our findings are not consistent with either DeBaryshe and Binder (1994) or Wu and Honig (2010). DeBaryshe and Binder, in their exploratory factor analysis of data with their sample of 155 primarily African American (63%) single-parent (77%) families, revealed a single component accounting for 52.5% of the variance, suggesting a unitary rather than multifaceted structure to parental reading beliefs. Wu and Honig, in their second-order factor analysis of 731 well-educated middle-class mothers, found two components accounting for 41.6% and 13.1% of the variance, respectively. Our sample was composed of primarily low–socioeconomic status Hispanic and African American children. Although it is difficult to draw definitive conclusions from only three studies with different factor analytic approaches to the PRBI, given the different findings across studies, it might be that parental reading beliefs differ cross-culturally or by socioeconomic status. Perhaps a more emic rather than etic approach to studying parental reading beliefs is needed.

The discrepant results in this study lead us to conclude that there is a clear need for researchers to build a scientific base for practice and policy that recognizes the wide range of HLEs that families create in diverse communities as they participate in literacy practices with children. Until further validation occurs, we might conclude with the possibility that, in its present form, the PRBI may not represent the diversity of socioeconomic, cultural, and linguistic domains in families.

Refined and empirically tested and validated models of the HLE in general, and beliefs systems specifically, that recognize the multiple ways in which home environments are shaped by linguistic, cultural, and economic forces may help in estimating family risk and subsequently designing HLE interventions that not only alter HLE behaviors but also produce lasting HLE changes (Burgess et al., 2002). Given that sound measures are essential to advancing both research agendas and the evaluation of effective practices, the results of our study are illuminating. To our knowledge, there are no other measures of parental reading beliefs. Nevertheless, our findings underscore the caution needed when considering the use of any instruments that are not standardized or normed with larger representative samples, as in this case.

Limitations and Suggestions for Future Research

A frequently cited limitation concerns the method of measurement of the PRBI. The PRBI relies on parent self-reports, which like all self-reports can be susceptible to social desirability bias. The small sample size utilized in the current study is also a major limitation, as it reduced the reliability of the results. Finally, caution should be taken before generalizing the results. Future studies are warranted to further examine the validity and reliability of the PRBI. Given the mixed findings for the subscales, future research using larger samples should seek to replicate both our findings of misfit of the overall PRBI scale as well as our exploratory factor analysis results.

This study joins Wu and Honig (2010) as an independent preliminary analysis of the psychometric properties of the PRBI. Although the subscales of the PRBI model are intuitively appealing, they warrant continued investigation. Future research should continue to empirically refine the PRBI construct by recognizing the multiple domains of influence. Continued replication of our findings with larger and more diverse samples is recommended.

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APPENDIX

Parental Beliefs Reading Inventory Items by Subscale

Teaching Efficacy

PB1 As a parent, I play an important role in my child's development.

PB2 There is little I can do to help my child get ready to do well in school.

PB3 My child learns many important things from me.

PB4 I would like to help my child learn, but I don't know how.

PB5 I am my child's most important teacher.

PB6 Schools are responsible for teaching children, not parents.

PB7 Parents need to be involved in their children's education.

PB8 When my child goes to school, the teacher will teach my child everything my child needs to know so I don't need to worry.

PB9 Children do better in school when their parents also teach them things at home.

Positive Affect

PB10 I find it boring or difficult to read to my child.

PB11 I enjoy reading with my child.

PB12 I have good memories of being read to when I was a child.

PB13 Reading with my child is a special time that we love to share.

PB14 My child does not like to be read to.

PB15 I feel warm and close to my child when we read.

PB16 I have to scold or discipline my child when we try to read.

PB17 I want my child to love books.

PB18 I don't read to my child because he or she won't sit still.

PB19 I read to my child whenever he or she wants.

PB20 When we read I try to sound excited so my child stays interested.

Verbal Participation

PB20 When we read I try to sound excited so my child stays interested.

PB21 Children learn new words, colors, names, etc., from books.

PB22 Reading helps children be better talkers and better listeners.

PB23 My child knows the names of many things he or she has seen in books.

PB24 When we read, I want my child to help me tell the story.

PB25 I ask my child a lot of questions when we read.

PB26 When we read, I want my child to ask questions about the book.

PB27 When we read we talk about the pictures as much as we read the story.

Reading Instruction

PB28 I read with my child so he/she will learn the letters and how to read simple words.

PB29 Parents should teach children how to read before they start school.

PB30 My child is too young to learn about reading.

PB31 When we read, I have my child point out different letters or numbers that are printed in the book.

Knowledge Base

PB32 I try to make the story more real to my child by relating the story to his or her life.

PB33 Stories help build my child's imagination.

PB34 My child learns lessons and morals from the stories we read.

PB35 Reading helps children learn about things they never see in real life (like Eskimos and polar bears).

PB36 My child learns important life skills from books (like how to follow a cooking recipe, how to protect themselves from strangers).

Resources

PB37 Even if I would like to, I'm just too busy and too tired to read to my child.

PB38 I don't read to my child because we have nothing to read.

PB39 I don't read to my child because there is no room and no quiet place in the house.

PB40 I don't read to my child because I have other, more important things to do as a parent.

Environmental Input

PB41 Some children are natural talkers, others are silent. Parents do not have much influence over this.

PB42 Children inherit their language ability from their parents, it's in their genes.