

## Psychometric properties of parent reading belief inventory with a sample of Indonesian mothers

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### Article Info

#### Article history:

Received Sep 25, 2022

Revised Apr 14, 2023

Accepted May 26, 2023

#### Keywords:

Children

Early childhood

Mothers

Parent reading belief inventory

### ABSTRACT

The beliefs that parent currently have are increasingly attracting attention regarding the implementation of literacy for their children at home, was measured using parent reading belief inventory (PRBI) measuring tool developed by DeBaryshe and Binder. PRBI has not been adapted in Indonesia, making collaborative research difficult. Respondents in this study were mothers who had children aged 3-6 years old totally 177 respondents. Sampling technique with quota sampling. This research aims to develop a reliable and valid version of PRBI in Indonesia using International Test Commission guidelines. Data analysis using the second-order confirmatory factor analysis. The results showed that PRBI instrument was a valid and reliable instrument to measure the beliefs of parents in carrying out reading aloud activities with their children in Indonesia. Future research is expected to improve PRBI construct empirically based on the culture in each region, so that it can identify types of parents' reading beliefs that implication children's reading abilities.

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## 1. INTRODUCTION

Nowadays, a cultural leap has become a recent phenomenon in society. People who originally had an oral tradition then drastically shifted to an information technology culture, namely from the tradition of storytelling to the tradition of using modern gadgets or smartphones. Of course, it is not surprising that today's children still feel strange to books, even though books are windows of knowledge that can open one's educational horizons [1]. Based on the five-year research conducted by Progress in International Reading Literacy Studies (PIRLS), as reported by Cahyani [1], Indonesia was in position 36 of the 40 countries. Furthermore, based on data from the Center for Research on Educational and Cultural Policies in 2019, the national average reading activity index of 37.32% was still relatively low [2]. This has implications for the low reading interest of Indonesian children, where the early literacy experience of reading or even getting acquainted with books is not pleasant for children. Therefore, the role of parents plays an important role in developing optimal literacy in children during their development period. Based on data from Preventing Reading Difficulties in Young Children, that the adults' role both in quality and quantity is good on the experience of early literacy in children [3].

Parents' beliefs support the development of children's literacy, especially pre-school age children, in carrying out reading aloud activities with their children. The beliefs that parents currently have are

increasingly attracting attention regarding the implementation of literacy for their children at home [4]–[7]. According to Harkness and Super [8], parental beliefs are a component of self-development that is structured based on the culture of parenting activities and practices. Parental beliefs as the basis for parenting for children are associated with culture and the starting point for parents' experiences with children [9]. Besides, parental beliefs are the basis of parenting activities that can form patterns of creative and interactive activity between parents and children, in which it emerges from the individual background of parents, norms, and cultural standards [8], [9]. Goodnow [10] stated that parental belief comes from the idea of guiding children's activities, especially pre-school age children.

Research on parental beliefs has mainly focused on education and parenting practices, such as in Mexico and America. The study examining parental beliefs about parenting practices shows that mothers believe in the importance of developing appropriate attitudes and self-esteem, and emphasize parent-child relationships rather than early developmental achievements [11]. The development of children's literacy studies in Greece is of particular concern to parents, because it can bring success to children in school and in life. However, there are differences in parents' attitudes and behavior towards literacy understanding, which are related to the various socioeconomic and educational levels of parents [12]. Therefore, the literacy beliefs of parents of pre-school children are fundamental because it is the primary determinant when designing a literacy-rich home environment and assisting the development of literacy activities at home [13].

Several studies in Indonesia related to children's literacy activities are still using interview, observation, and documentation for the data collection techniques [14], [15], so that parents lacked ways to stimulate literacy in children. Although Farihatin [16] stated that the activity of reading story books with children carried out by parents who are housewives takes longer and is more frequent than parents who work as professionals. This is a dilemma for parents, so it is essential to know the reading ability of parents, especially mothers, to improve children's literacy understanding. The study explains the importance of literacy beliefs for parents, so the researchers tried to create and develop a measuring instrument to identify literacy beliefs for parents. It is very crucial to have a reliable and valid instrument or scale so that the researchers use parent reading belief inventory (PRBI). This measuring instrument has been used and adapted in various countries such as south-central Texas [17], Turkey [13], Mexico [18], Taiwan [19], Greece [12], Republic of Albania [20], and Spain [21].

The measuring instrument of PRBI was widely developed for collaborative research in Western countries, but it has not yet been adapted into Indonesian. In many studies abroad, PRBI has been applied and used to examine the relationship between parental beliefs and the outcomes they have in children in which it has been shown to influence the development of children and their school courses. However, the minimum effort of study of these psychometric properties of the measuring instrument did not provide adequate findings regarding the confirmation of the seven dimensions as suggested by the instrument developer where only minimal evidence was found, i.e. sufficient reliability of the seven dimensions [12]. The adaptation process needs to take into account the diversity of cultures between the countries where PRBI was developed and in Indonesia to minimize the possibility of bias. According to He and van de Vijver [22], there are three general biases in cross-cultural studies related to constructs, methodological procedures, and statement items. This research aims to develop a reliable and valid version of PRBI in Indonesian using International Test Commission (ITC) guidelines. The research questions are: i) Does the Indonesian translation and adaptation correspond to the seven dimensions of the measuring instrument of PRBI?; ii) Does the Indonesian version of PRBI provide good evidence in terms of reliability and validity based on the loading value of CFA, CR, and AVE to measure the mothers' activity of reading aloud with their children?

## **2. RESEARCH METHOD**

### **2.1. Participants**

This research was quantitative research with a survey research design in which it is a quantitative research procedure carried out to obtain a description of the attitudes, behaviors, and characteristics of the population obtained through a sample in the population [23]. The participants of this study were mothers who had children aged 3-6 years with an age range of 20-35 years with a total sample of 177 mothers. The sampling technique used quota sampling, which is a technique that determines the sample from a population with certain characteristics with the desired quota [24]. The researchers referred to the sample size table as proposed by Krejcie and Morgan. If the population is 320 people, then the sample size is 175.

### **2.2. Data collection**

Data was collected by distributing online questionnaires using the google form application. Respondent involvement was voluntary. Besides, informed consent was presented at the beginning of the questionnaire. The measuring instrument used in this research is PRBI which was developed DeBaryshe and Binder [25]. PRBI consists of 42 items related to parents' beliefs in reading stories to preschool-aged children

and the perception of parents' self-efficacy as teachers for their children [25], [26]. PRBI has seven subscales, which form a single factor and can be used as a total score. The seven subscales of PRBI include: i) teaching efficacy; ii) positive affect; iii) verbal participation; iv) reading instructions; v) knowledge base; vi) resources; and vii) the environmental input. Respondents' answers were based on the Likert scale type, consisting of four response options ranging from strongly disagree to strongly agree. DeBaryshe and Binder [25] reported a range of alpha reliability coefficients for the subscale of PRBI from 0.50 to 0.85. In this study, the instrument was translated from English to Indonesian and then translated back to the English version to ensure the translation accuracy and adaptation of the language to the Indonesian cultural context.

### 2.3. Research procedure

The procedure for adapting the measuring instrument of this study referred to the guidelines for translating and adapting tests (second edition) from ITC [27]. The ITC consists of 18 guidelines organized into six categories: pre-condition, test development, confirmation, administration, scoring and interpretation, and documentation. In this study, the researchers carried out the pre-condition, test development, and confirmation. The first phase was precondition. This step consisted of three processes that must be carried out, namely: i) Requesting permission from the developer of the measuring instrument by sending a message via email and receiving a response regarding the permission to translate and adapt the use of the measuring instrument of PRBI to be adapted into Indonesian; ii) Three experts, namely two educational psychologists and one expert in early childhood education, conducted a literature review on the concept of parental belief in reading aloud to children, to avoid construct bias; iii) Conducting focus group discussion involving two respondents to minimize the influence of cultural and linguistic differences.

The second phase was testing development. This step includes several processes, including i) Forward translation is the process of transforming PRBI into Indonesian conducted by two translators who have good English skills and understand the cultural characteristics of research respondents; ii) Backward translation is the process of translating the Indonesian version of the measuring instrument into the language used in the original measuring instrument, namely into English; iii) conducting expert review to provide evidence that the instructions and content of the statements had the same meaning for the Indonesian context; iv) Providing evidence that item formats and other procedures were appropriate for Indonesian respondents; v) Confirming the evidence on the psychometric quality of the adjusted measuring instrument.

The adapted version of the measuring instrument was presented to five readers, namely mothers who had children aged 3-6 years. This step was done to find out the layman's understanding of the statement of each item. The third phase was confirmation, done to know the validity of the measuring instrument empirically. In this phase, the measuring instrument was ready for field testing and used in this study. The researchers used two approaches, namely content validity (evidence based on test content) and internal validity (evidence based on internal structure) [28].

### 2.4. Data analysis

The second-order confirmatory factor analysis with AMOS 21 software to analyze research data with guidelines for fit indexes which consisted of i) Chi-Square; ii) P-value; iii) Root mean square error of approximation (RMSEA); iv) Goodness of fit index (GFI); v) Comparative fit index (CFI); and vi) Adjusted goodness of fit index (AGFI). Besides, the researchers also conducted a reliability test closely related to the consistency of the variables. The construct reliability is good if the composite reliability value is  $>0.7$ , and the average variance extracted value is  $>0.5$  [29].

## 3. RESULTS AND DISCUSSION

### 3.1. Results

The mechanism for implementing the adaptation process in this research instrument was carried out qualitatively and quantitatively. The first process was done qualitatively on forward translation, in which there is one sentence that requires discussion, namely "*children to better at school when their parents also teach them things at home*" on item 9. The first translator meant "*children do better at school when their parents also teach them at home,*" while the second translator meant "*children will achieve better at school when parents also teach them about something at home.*" Based on the discussion among the translators, the sentence "*children can follow lessons better at school when parents also teach them at home*" was considered more representative of its original meaning. Meanwhile, at the stage of back translation, there were several terms given by the translator, namely item number 12, "*I have good memories of being read to when I was a child*" in the original scale translated into "*I have good memories when my mother read the story.*"

The following process was carried out quantitatively by evaluating the rating scale from Sperber [30], namely comparability and similarity items between the scale of the original version and the scale of the

translated version with the scale range from 1-7. If items are very identical and there is no difference, then the items are given a score of 1, but items with different meanings are given a score of 7. Equivalent items are items with a mean score of <4 [30]. Based on the results of the calculation of the comparability and similarity of the items, it was obtained that there were no items that had an average score of more than 4. This means that the experts concluded that basically, there were no significant meaning problems between the two versions of the scale even though they used different words. The average score on the total scale for the comparability and the similarity of the items is presented in Table 1.

Table 1. The average score of comparability and similarity

Average of comparability		Average of similarity	
Range	Total	Range	Total
1.00-3.00	1.17	1.00-3.00	1.20

The next process was to carry out initial validation by testing content validity using the content validity index. Item is good if it has a value of content validity index of at least 0.78 and has empirical evidence related to its content validity [31]. The calculation of items on the measuring instrument of PRBI showed a very high value, which is 1.00. Thus, the I-CVI for adaptation measurement tools complies with a minimum standard of 0.78, both in terms of relevance, importance, and clarity. After the I-CVI was done, the next step was to calculate the S-CVI for each aspect. The good S-CVI has a value of more than 0.90, so it has good validity [31]. The instrument of PRBI has an S-CVI of 1.00 and is based on the final results of the calculation of both I-CVI and S-CVI, so it can be said that the instrument has acceptable content validity.

The next step was to determine the construct validity from the test results of measuring instruments. The first test of the measuring instrument resulted in a model that was not fit, so the researchers made some modifications as suggested by AMOS. The modification indices were analyzed using confirmatory factor analysis (CFA) second order, then the path diagram was obtained and the results of the test of goodness of fit for PRBI instrument were shown in Table 2. The results of the goodness of fit test with details of five criteria indicated good fit, namely Chi-square, P-value, RMSEA, CFI, while the criteria of GFI and AGFI indicated marginal fit. Based on the test results, it can be concluded that PRBI measurement model was categorized as a good fit.

Table 2. Results of the goodness of fit of the parent reading belief inventory

The goodness of fit criteria	Acceptable fit size	Estimated results	Description
Chi-Square	Small value	515.131	Good fit
P-value	≥ 0.05	0.453	Good fit
RMSEA	< 0.08	0.006	Good fit
GFI	≥ 0.90	0.866	Marginal fit
CFI	≥ 0.90	0.999	Good fit
AGFI	≥ 0.90	0.826	Marginal fit

As presented in Figure 1, it was known that the model was fit, then the researchers looked at the loading factor for each item that formed PRBI construct. The minimum accepted value of loading is 0.5 [29]. Based on the analysis results, 36 items had good validity on PRBI construct. The summary of the loading factors can be seen in Table 3.

The explanation has shown evidence supporting the content validity and construct validity. The researchers further conducted reliability testing. The reliability testing used the composite reliability (CR) value which functions to see the reliability of the indicator individually by considering the loading factors value on each item. Besides, the reliability testing also used the value of average variance extracted (AVE), which functions to show the total variance of a contract described by the measurement. A construct is acceptable if it has a minimum value of 0.7 for CR and 0.5 for AVE [29]. The results of the calculation of the composite reliability and the value of average variance extracted can be seen in Table 4.

Based on Table 4, it can be said that the composite reliability value is >0.7, and the value of the average variance extracted is >0.5 so that it exceeds the threshold. Strong internal consistency was also reported by DeBaryshe dan Binder [25] that the range of alpha reliability coefficients for PRBI subscales is 0.50 to 0.85, which is supported by the results of research of Gonzalez *et al.* [17] that the alpha reliability coefficient for PRBI subscales is 0.68 to 0.72.

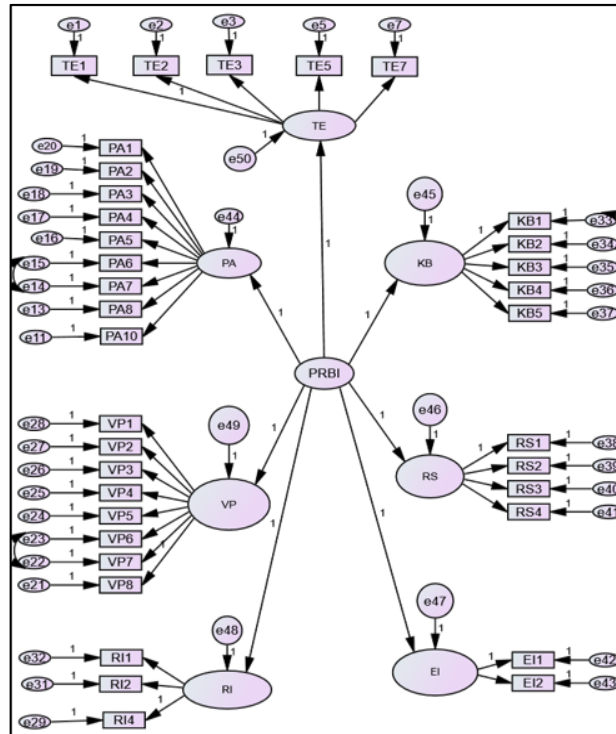


Figure 1. Path diagram of the adaptation of PRBI

Table 3. Factor loading score of PRBI

	Aspect/items	Factor loading score
Teaching efficacy	TE1	0.687
	TE2	0.765
	TE3	0.715
	TE5	0.758
	TE7	0.688
Positive affect	PA1	0.755
	PA2	0.825
	PA3	0.752
	PA4	0.804
	PA5	0.701
	PA6	0.694
	PA7	0.627
	PA8	0.639
	PA10	0.568
	Verbal participation	VP1
VP2		0.777
VP3		0.72
VP4		0.72
VP5		0.743
VP6		0.648
VP7		0.683
VP8		0.633
Reading instructions	RI1	0.916
	RI2	0.724
	RI4	0.764
Resources	RS1	0.628
	RS2	0.842
	RS3	0.816
	RS4	0.821
Environmental input	EI1	0.700
	EI2	0.767
Knowledge base	KB1	0.563
	KB2	0.811
	KB3	0.843
	KB4	0.779
	KB5	0.814

Table 4. Calculation of CR and AVE

Dimensions	CR	AVE
Teaching efficacy	0.846	0.523
Positive affect	0.901	0.507
Verbal participation	0.890	0.504
Reading instruction	0.846	0.649
Knowledge base	0.877	0.591
Resources	0.861	0.611
Environmental input	0.7	0.539

### 3.2. Discussion

The instrument of PRBI has been adapted and tested in accordance with the context of the society in Indonesia. The researchers confirmed 36 valid items in seven dimensions of PRBI instrument. The extracted items in this study were item numbers 4, 6, 8, 9, 18, and 30, which had a loading factor value of less than 0.5. The results of the adaptation test are in line with the results of the study by Çetin, Bay, and Alisinanoğlu [32], who conducted research on adaptation of PRBI measuring instrument with 420 mothers as respondents where the invalid items were items number 8 and 30, while item number 31 showed inconsistency with the total score. Therefore, the results of adaptation test in this study are compatible with samples of different contexts and cultures.

The researchers also confirmed that item number 20 was included in the verbal participation dimension with the consideration that based on the results of the content validity analysis, item number 20 was representative for the verbal participation dimension, where there was a role for mothers to read stories aloud and enthusiastically for children to stay interested in following the story. Wu dan Honig [19] conducted research that highlights the importance of mothers' involvement in understanding verbal participation strategies during reading and appreciating their own role in early language learning for their children. This is supported by a study conducted by Saban, Altinkamis, and Gul [13], in which they entered item number 20 on the verbal participation dimension.

This study aims to develop a reliable and valid version of PRBI in Indonesian. The results showed that the model was adaptive and quite similar to the original PRBI model developed by DeBaryshe dan Binder [25]. Besides, this adaptation instrument has met the requirements of loading factor, CR, and AVE. The research measuring instrument was adapted from the guidelines for translating and adapting tests from the ITC [27], so that the quality of content validity and statistical test results cannot be doubted. On the other hand, the researchers also held correspondence with the developer of the original PRBI instrument for permission to adapt the instrument. Therefore, the Indonesian version of PRBI can measure the mothers' activity in reading aloud with their children.

Parents' beliefs about literacy are very important and continue to be the attention of current researchers who want to see how parents' beliefs can interact with their children, for example in parental involvement in family-based play activities, and reading aloud activities [33], [34]. Reading aloud activities can be started early. The earlier books are introduced, the more optimal the results will be in an effort to foster children's love for books with the bonus that children will be able to read on their own. Reading aloud can be done anywhere and anytime. The thing that needs to be considered is the frequency and consistency of doing reading aloud activities that are carried out regularly so that it can encourage the affective domain of reading aloud, and foster a positive attitude towards reading [34]. In line with this, Wright [35] stated that reading aloud provides benefits for children to read and when they learn to read. Through interactive aloud reading, children can learn about the world, learn new vocabulary, learn about text and how text functions, and acquire the skills and strategies they will need as they become independent readers.

Based on the results of research conducted by Krijnen *et al.* [36] that most parents state that literacy activities at home can increase the attachment between parents and children. The results of the study are supported by Mesman *et al.* [37] that the positive influence of parents on children is seen as an ideal parental characteristic. Similarly, Aram, Meidan, and Deitcher [38] in the results of their research on parental literacy belief in kindergarten-age children in Israel, that all parents really appreciate the closeness that occurs between parents and children. Friesen and Butera [39] also stated the results of a representative study, that most parents spend time with their children to carry out children's literacy development activities. This relates to our finding that the development of PRBI measuring tool was one of the first attempts to design a valid and reliable measuring tool to examine parental beliefs in relation to parenting practices in the family. In line with the statement by McBride-Chang [40] that parenting styles and parental reading beliefs can also affect children's literacy development, encouraging the improvement of children's literacy skills.

In general, the instrument of PRBI in the Indonesian version can help parents and educators to identify the types of parental reading beliefs that have implications for children's reading abilities. Parents' reading beliefs, as well as teaching efficacy, positive attitudes, verbal participation, and basic knowledge had

a positive effect on children's reading ability [41]. The implications of reading aloud activities done by parents with their children are positively related to early childhoods' language and literacy skills, especially in western countries [42]–[45].

Although most of the current research is considered PRBI to be typically developed in western countries, there is evidence from previous studies in Asian countries, such as Taiwan, that PRBI is well developed to be a useful instrument for assessing the reading activity of mothers with their children [19]. Even though mothers in Taiwan are poorly educated and feel they do not know how to help their children in early reading, mothers still do their best and are structured to teach children words and sounds [19]. This is in line with the study conducted by Ran [46] that the characteristics of parents in China prefer a direct teaching approach. Further, Wang *et al.* [47] in a research study stated that parental beliefs and parenting practices are positive factors for child development in rural China, and it can improve children's academic achievement when parents are involved in accompanying children's learning [48].

#### 4. CONCLUSION

Research indicates that based on confirmatory factor analysis, the translation and adaptation of the Indonesian version of parent reading belief inventory measurement instrument are appropriate with the seven dimensions. The answer choice category with four answer choices can be maintained. Overall, the multidimensional PRBI instrument provides good evidence on the reliability and validity to measure reading aloud activity between mothers and their young children and plays a role in investigating the process of reading interactions between mothers and children in Indonesia.

The use of PRBI instrument only applies to parents with early childhood, so the results may not apply to the population of parents with teenage children. The evaluation of conceptual equivalence and item resulted in a cross-cultural adaptation version of PRBI that is feasible and practical to measure parents' beliefs in carrying out reading activities according to the Indonesian culture. Future research is expected to refine PRBI construct empirically based on the culture of each region. The methodology is also important to note because it has an influence on the equivalence of measurements based on population characteristics. Data collection in this research is a survey conducted online. Limitations in conducting online surveys have consequences for researchers to be more careful in ensuring whether respondents meet the research criteria, and be careful in selecting data so that there is no duplicate data. Therefore, suggestions for further research can use surveys paper-based tests.

#### ACKNOWLEDGEMENTS

Thanks to Barbara DeBaryshe, Ph.D, for the guidance and permission in the process of adapting the parent reading belief inventory measuring instrument. Thank you also to Rector Universitas Nusantara PGRI Kediri for providing research stimulus funds in 2021. Research assignment agreement letter based on LPPM Universitas Nusantara PGRI Kediri contract number: 111.04/A/LPPM-UNP Kd/IX/2021.

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