

Cultural Adaptation of Preschool Language Scale-4 (PLS-4) for Screening Language Development of Bangla Speaking Children

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Abstract: Language is one of the important domains of children's overall development. Language development in children is a complex, dynamic and multidimensional process and children learn and develop new language skills step by step. Language screening of young Bangla speaking children has been a challenging issue for researchers and clinicians as there is a substantial lack of standardized test to measure the language development of young Bangla speaking children. So, the aim of this study was to cultural adaptation of Preschool Language Scale-4 (PLS-4) which is widely used language test to screen young children's language development. Although the study findings might not be representative of the whole population due to limited number of participants and non-randomization of the participant's selection, in this context, this study can be used as a baseline document for further studies of language development in Bangla speaking children, including children with communication difficulties.

Introduction

Language is the medium of communication which is used to express ideas, knowledge, thoughts, feelings and opinions. It is essential in daily living as it works as a vehicle for exchanging views (Owens, 2001). To use language as a way of communication, children move developmentally through a series of milestones. Language development is a complex process and it differs from child to child (Yliherva et al., 2009). Language development is one of the useful initial indicators of a child's overall development and cognitive ability. Language development is a process which starts very early in human life. A two to three years old child understands differences in meaning (for example: go-stop, in-on, big-little, up-down), follows two requests (e.g. get the book and put it on the table), listens to and enjoys hearing

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stories for longer periods of time. In relation to expressive language development, a two to three years old child has a word for almost everything, uses two- or three- words to talk about and ask for things, uses k, g, f, t, d, and n (/k/, /g/, /f/, /t/, /d/, /n/) sounds, speech is understood by familiar listeners most of the time, often asks for or directs attention to objects by naming them, asks why (Owens, 2001). It is important to pay attention on the milestones of children's language development to identify any delay or deviation at the very early stages of life (Rescorla and Alley, 2001).

The early detection of language problem is important, as this influences the overall development of a child (Luinge et al., 2006). Identification of children at risk for delay or disorder may lead to interventions, increasing chances for improvement (Nelson et al., 2006). According to Anam (1996), language delay or disorder is a common childhood problem and a large number of children are affected by different kind of language disorders. Among the 10% of the Bangladeshi population (people with disabilities) approximately 4-5% has some type of communication impairment. Anam (1996) reported that the number of children with language impairment in Bangladesh is huge and there is no established screening tool to assess the language development of children. So that, the early identification and intervention is difficult for the children with language impairment. Literature on language development illustrates that, language screening and assessment is a vital source of information informing the intervention for children with language impairment (Streng et al., as cited in Anam, 1996). Screening and or assessment provides information on a child's language ability as well as giving potential ideas about the suitability of any language intervention that the child and family or teachers need to help overcome the problems (Schirmer, as cited in Anam, 1996). Yliherva et al. (2009) found that, in clinical work, standardized language tests and normative evaluation methods are often used to measure children's language abilities in vocabulary, syntax, morphology and other areas of language structure. However, screening for language delay is not widely practiced in primary care system in Bangladesh. The lack of a tool for screening makes it difficult for speech and language therapists, teachers and other relevant professionals to assess properly and give a diagnosis to the children. All these factors give importance to develop a reliable, valid, efficient and inexpensive screening tool for Bangla

speaking children.

Lack of instrument to screen or assess children put barriers on the professionals working to improve their growth and development particularly in the developing countries. Constructing a tool or instrument requires immense effort and has to go through an extensive process. Sometimes it becomes difficult to meet the expense for the massive project, manage the time period and availability of expertise. Therefore, cultural adaptation of an instrument allows the academic and institutional researchers, who are working with large number of infants, children, adolescents and adults to determine a specific trend over a long period of time, be able to use a valid tool without much difficulty. PLS-4 is a standardized language screening tool designed to provide the professionals (Speech and Language Therapist [SLT], teachers, parents, child development specialist) a means of screening the language development of children. It provides the indication about the landmark of children's language development (Zimmerman &Castilleja 2005).

In order to develop a screening tool in any language, it is necessary to have knowledge and available information on that language particularly on the development milestones. There are some established screening tools in English but these tools are not appropriate for Bangla language because of the socio-economic, cultural, and linguistic differences. Children who demonstrate language impairment at an early age may also show behavioral problems, impaired psychological adjustment/emotional problems and other social difficulties at a later age that can impact on school achievement/academic learning and career opportunities. To minimize the likelihood of these later effects, it is important to identify the children who have a language impairment as early as possible and language screening tool can be the most useful and simple method to identify these children (Shipley and McAfee 2004).

The researcher anticipates that this study would provide a lot of useful information to support the language development of typical children as well as children with language impairments. There is a great vacuum in the research on typical language development of Bangladeshi children. This vacuum of knowledge therefore has highlighted a great importance for research in this field because of the vast number of

children with language impairment. It is expected that this work would assist the SLTs, parents, primary/pre-primary school teachers and other relevant professionals who are involved in the field of health, disability, and education in Bangladesh. Finally, the findings of the study would contribute to the knowledge of planners, policy makers and others who make decision regarding the implementation of interventions for the children with language impairments and therefore; might have an impact on the overall wellbeing of the children.

Objectives of the Study

The main objective of the study is to cultural adaptation of Preschool Language Scale-4 (PLS-4) for 2 years to 3 years old Bangla speaking children. The specific objectives are as follows:

1. To translate the PLS-4 in Bangla language and determine the construct equivalence
2. To validate the PLS-4 through pilot testing to use in the specific community

Methods of the Study

The instrument

The Preschool Language Scale (PLS) was originally developed to identify language disorders and delays in preschool-aged children (Qi & Marley, 2009). It is a standardized language test widely used by speech-language pathologists and special education teachers to assess receptive and expressive language abilities of young children at risk. The Preschool Language Scale – 4th Editions (PLS-4) (2002) is an individually administered test designed to identify young children from birth to 6 years 11 months old who have a language disorder or delay. It consists of two subscales for the assessments of auditory comprehension and expressive comprehension respectively (Suen, n. d.). It also provides three supplementary measures, which include an articulation screener, a language sample checklist and a caregiver questionnaire. There are a grand total of 68 task items. Dependent on the age of the individual child, the administration time is reported to be between 20 to 45 minutes. Approval from the concern authority was taken to conduct this study. Before starting the adaptation process permission was taken from the developer of PLS-4. In this study, the entire PLS-4 has not been

adapted, only the auditory comprehension (task from 25 to 32) and expressive communication (task from 26 to 35) part age range from 24 months to 35 months was adapted.

Method

The survey and observation method were used to conduct the research project.

Setting of the study

Two villages of SavarUpazilla of Dhaka district were selected as an area for this study due to enable easy access for the researcher and to consider the lack of knowledge of the parents about the language development of their children.

Participants of the study

The participants for this study from the population were selected by using nonrandom purposive sampling method. Total 20 children were selected as participants; 10 from each age range (24-29 months and 30-35 months).

Adaptation procedure

The aim of adaptation process is to achieve different language versions of an instrument that are conceptually equivalent in each of the target countries/cultures. That is, the instrument should be equally natural and acceptable and should practically perform in the same way. The focus is on cross-cultural and conceptual, rather than on linguistic/literal equivalence (WHO, n. d.). It was recognized that there is no fundamental rule for cultural adaptation. Following the recommendation of (WHO, n. d.) and Van Widenfelt and Colleagues (2005) the following steps were taken while translating the instrument. This involves the following phases:

1.1 Determining construct equivalence

“To permit valid group comparisons on translated tests, the construct measured by these tests must be equivalent across language groups” (Gierlet et al., 2000). This combines theoretical and practical approaches. In theoretical approach one panel of experts were associated to review the construct of the original instrument to the target area. For this study the instrument was reviewed by two Assistant professors of Psychology and

one professor of Anthropology of a public University. The experts agreed on the equivalence of the original instrument to the target population. As PLS-4 had already adapted and tested in several countries the practical approach was enclosed.

1.2 Translation

Over the last few years, a certain agreement had been made that translation is the most suitable methodology for the process of adaptation (Beaton et al., 2000). This process may be summarized in three main phases: Translation into the target language (Forward translation), Revision by the experts and sample of the target population, and Back-translation using a team of translators.

1.3 Formation of first synthesized version

Forward translation

This was the first step of adaptation. First, three independent translators translated the English (original) version of PLS-4 into Bangla, literally. The translators were the professionals whose mother tongue was the target language and were unaware of the purpose of this study. After the translation the items were revised by the researcher and with experts in the field. Two psychologists, one speech therapist compared the three Bangla translated PLS-4 short form (completed previously by three other independent translators) and formed a consensus. From their expert views the first synthesized version was generated.

1.4 Discussion on first synthesized version

Observation

The aims of this phase were to check the content of the translated instrument was well understood, determined whether the vocabulary was suitable and whether the items were culturally applicable (Beaton et al., 2000). From the observation, the researcher took advantages of the children interaction as well as determines the understandability and participant acceptability of the instrument and whether the assessment of the constructs was relevant and important. Seven children from the target population (those were not selected as sample) were observed for collecting information about children's understandability of the instrument. The observation was conducted in the study area (in the children's house) where the possibility of disturbance by external activities

was minimal. Each observation took 30-40 minutes. Researcher observed the children's understandability about the appropriateness, relevancy, importance, and clarity of the PLS-4 short form tasks. Based on the analysis of the observation data, few items were modified because of redundancy, perceived lack of importance, lack of specificity, or participants do not have understanding on the item. Few alternatives were proposed by the parents. These alternatives were assessed by the researcher and a second synthesized version of the scale was developed.

Panel of experts

This version was revised by a group of five experts (two psychologists, two therapists and one pediatrician). The experts identified the items which have greater problems for adaptation. From their observation a third synthesized version was generated.

1.5 Formation of final pilot version

Back translation to the original language

The 3rd synthesized version was translated back into English. With the Bangla translation version, three independent translators, who did not have any information about PLS-4 short form, did the back translation. Each first translation was back translated independently from each other. The back translators were bilingual (in both Bangla and English) and were fluent in the idioms and colloquial forms of the source language. Back-translators were not aware of the intent and concepts underlying the scale. After the back-translation, modification of words, concepts, pictures, objects that had no clear equivalence in the target language was done by the experts of psychology background and the researcher. Similarity of meaning, even at the expense of similarity of form, was much more desirable than the opposite. Comparison of the three English back translated versions and the English original were done by rating each item on a 3- point scale (3 equals "best agreement", 2 equals "almost same", 1 equals "worst agreement").

Review

Items with apparent inconsistency between the two language versions were modified and tied up. The final translated version was proofed by the researcher to check for minor errors which were missed during the translation process. This produced the pilot version of Bangla PLS-4 short form and made ready for the field test.

Field test

After translation of the instrument was completed, cultural appropriateness was determined, and instrumental discrepancies between the original and translated instruments were resolved, field test was performed using the finalized translated version with a small group of individual from the target population. 20 Bangla speaking children age between 2-3 years were selected for individual observation. The observation was administrated with consideration for the differences in expression and using of probe for the meaning of the children's response. The Bangla version of PLS-4 short form contained of 18 items. The participants were observed individually in their home environment. Theresearcher also discussed with the parents. Each observation took approximately 40 minutes to 60 minutes. Finally, initial pilot data was collected.

1.6 Statistical analysis

Item analysis

By computing corrected item-to-total correlation it was determined either an item in the instrument was useful and/or how it performed in the relation to the other items on the test. Data was analysed using the SPSS program (Version 17.0). The descriptive statistics was used for the analysis. Statistical significance was accepted at the 5% level.

Reliability determination

Cronbach's alpha coefficients were computed in order to measure the internal consistency of PLS-4. Cronbach's alpha coefficient range was considered from 0 to 1. Test-retest reliability was administrated on the same test and on the same subjects at two points in time to measure of stability over time. Five children were observed with the Bangla PLS-4 short form twice and were given a time interval of 5 days between the tests. Both tests were administered by the same examiner (Researcher). A 5-point Likert scale was developed ranges from "didn't understand (01)" to "understand well (5)". The test score was computed by the average understanding on all 18 items. Level of significance was (p value) computed on each task.

Validity determination

The panels of experts were asked to examine the Bangla version of PLS-4 for the content validity before the field test. The panel of experts judged the extent to which the content of the instrument appeared logically to examine and comprehensively include, in a balanced way, the full scope of the characteristics or domain it was intended to measure. They were asked to identify the item that had difficulty to understand or had question about.

Results

Formation of first synthesized version

During the process of forward translation it had been found that the word “shorts” from the task 25 of auditory comprehension is not frequently used word in that particular cultural context. So, ছোটজামা (/cʰotɔʃama/) was used as Bangla translation. The Bangla meaning of spatial concept (বস্তুর অবস্থান) was difficult for the children to understand because the Bangla meaning is very abstract. The task 31 in auditory subscale “Simple descriptive concepts” was also difficult for the children to understand as there were no appropriate objects or picture to make the children understood. The Bangla meaning of “raising intonation” and “windup toy” was difficult to made, so it was translated as “bring the voice up” (জোরেকথাবলা/ʃorekotʰɑ bola/) and “toys that move in the air” (বাতাসে দোলানো খেলনা /batɑʃædolanokʰælna/). Task 34 in expressive communication subscale was not appropriate for Bangla language as the structure “verb+ing” is not available in Bangla language. Table 1 shows the list of task/items that showed ambiguity.

Table 1: List of Tasks/Items with Ambiguity

Subscales	Tasks/Items	Words
Auditory Comprehension	25	shorts
	26	Spatial concepts
	31	Simple descriptive concepts
Expressive Communication	28	Windup toy
	28	Raising intonation
	34	Uses verb + -ing

Observation result on first synthesized version

The observation exposed some suggestions and identified children's response regarding the sensitivity of the task. For example, task 30 (expressive communication) was reworded to clarify that meaning and preserve the intent of the English task. Task 30 of the PLS-4 English version says "use different word combinations like: verb + noun" which was difficult for the participants to understand as this grammatical structure is not available in Bangla language. In the task 35 (expressive communication) modifiers was in Bangla language but it was impossible to make children understand. So, it was deleted from the Bangla PLS-4 short form.

Formation of 3rd synthesized version

The expert team identified tasks, objects and pictures that showed variation throughout the observation. Task 26 ("Take the block off the box") was unclear on explaining the part "off the box". Again the task 30 was not appropriate due to the difference in the structure of the two (English and Bangla) languages. Table 2 shows the synonyms and other names of the task that had brought confusion.

Table 2: Synonyms and others name

Subscale	Task/Item		Task/Item Content
Auditory Comprehension	26	Identifying clothing items on self or caregiver (Coat)	This was not a common dress for people of selected two villages
	26	Identifying clothing items on self or caregiver (Hat)	The picture of the "hat" of English PLS-4 was different from the "hat" of that community
	27	Understands spatial concepts	This was difficult to make the children understood as there were no appropriate objects or picture to make the children understood. Investigator had to give examples to make them understand

	29	Understand use of objects (show me what you use to cook food)	This was hard to understand for the children because the picture of the stove of English PLS-4 was different from that of the two villages
Expressive Communication	26	Name objects on photographs (Bird)	The picture of bird was not culturally appropriate
	28, 29	Windup toy	Was not culturally appropriate
	30	Uses different word combinations (verb+ noun)	Was not appropriate because Bangla language (grammar) structure is different than that of English language
	30	Uses different word combinations (noun + verb location)	This was hard to make understand. Had to give examples to make them understand. Structure is not similar in Bangla language.
	35	Uses a variety of nouns, verbs, modifiers, and pronouns in spontaneous utterances	Was very difficult to make the children understand. Investigator provided lot of verbal cues and modeling to make the children understood

Back translation and formation of final pilot version

During the back translation it was observed that few items were deviated from the original scale. Task 26 for auditory comprehension asked "Identify shorts". The meaning of 'shorts' was not reflected in the back translation version. Table 3 shows several sample tasks/item pairs (original and back-translation versions) from the PLS-4 translated into Bangla.

Table 3: Deviated Tasks/Items

Subscale		Task/Item	Explanation
Auditory Comprehension	26	"Identifies shorts"	Instead of "shorts" "small cloths or pants of boys/girls"
Expressive Communication	28	Raising intonation	Instead of "raising intonation" "raise the voice up"

Internal Consistency

Cronbach's Alpha (α) was used in order to measure the internal consistency of the scores. Cronbach's alpha score was 0.941 which indicates an excellent internal consistency of the item scores. The result for internal consistency of 18 tasks was computed by Pearson's correlation test is presented in the table 4. This table displays the correlation between a given task value item and the sum score of the other two items. Any item scored less than 0.30 was considered as weak correlation for item-analysis purposes. On the other hand, any item scored more than 0.30 was considered as a strong, positive correlation between the scores. Table 4 demonstrates the internal consistency of 18 tasks where a strong, positive correlation is seen between the scores.

Table 4: Internal correlation between the tasks

Tasks	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Auditory Comprehension Task 1	.745	.936
Auditory Comprehension Task 2	.609	.938
Auditory Comprehension Task 3	.727	.936
Auditory Comprehension Task 4	.745	.936
Auditory Comprehension Task 5	.765	.935
Auditory Comprehension Task 6	.609	.938
Auditory Comprehension Task 7	.745	.936
Auditory Comprehension Task 8	.548	.944
Expressive Communication Task 1	.727	.936
Expressive Communication Task 2	.727	.936
Expressive Communication Task 3	.745	.936
Expressive Communication Task 4	.609	.938
Expressive Communication Task 5	.727	.936
Expressive Communication Task 6	.745	.936
Expressive Communication Task 7	.765	.935
Expressive Communication Task 8	.609	.938
Expressive Communication Task 9	.745	.936
Expressive Communication Task 10	.448	.944

Test- retest reliability

Test-retest reliability method was administrated in order to test the stability and reliability of the instrument over time. It demonstrated that 17 of the 18 tasks of Bangla version PLS-4 short form had highly significant correlations ($p < .001$ or $p < .01$) [Table: 5].

Table 5: Test-retest correlation reliability for PLS-4 after five days

Tasks	Lower Value	Upper Value	P value
01	3.24	4.36	<0.01
02	2.72	4.08	<0.01
03	3.72	5.08	<0.01
04	3.24	4.36	<0.01
05	2.12	3.88	<0.01
06	2.72	4.08	<0.01
07	3.24	4.36	<0.01
08	2.12	3.88	0.001
09	3.72	5.08	<0.01
10	3.16	5.24	<0.01
11	3.24	4.36	<0.01
12	2.72	4.08	<0.01
13	3.72	5.08	<0.01
14	3.24	4.36	<0.01
15	2.12	3.88	0.001
16	2.72	4.08	<0.01
17	3.24	4.36	<0.01
18	1.48	4.52	.005

Discussion

At the beginning of the translation process it was decided to use a combination of translation techniques. In order to avoid the distortion of the translated (from English to Bangla) scale, a rigorous adaptation process was required. Independent forward and backward translators were appointed to prepare the PLS-4 short form. A team of expert was involved to finalize the adapted PLS-4. This process ensured the validity

and satisfaction of the adaptation procedure. Most of the translation processes were completed without any severe difficulties. During forward translation few questions required elaboration; few questions required rephrasing with similar type of words by keeping the original intent of the question. Afterward it was decided to use example based on the daily life experiences.

Observation allowed to further test to face validity of the translated instrument by uncovering the meanings that participants have already pointed. Although the wording of the items/tasks was not changed after the observation, data from the observation clearly indicated items/tasks that were not always capturing responses that were recognized to children's performance for that specific community. For example, the meaning of the task 30 (expressive communication) was to know about the children's ability to uses different word combinations (e.g. verb +noun). After the Bangla translation it became difficult to perform for the children as the word combination (verb+noun) is not usual in Bangla language structure. To overcome this, task was reworded and used probe when necessary. It was also decided to use cultural sensitive example to clarify.

After the observation, the researcher with the team experts modified, included probes and examples. It helped to identify list of disputed translated issues (semantic equivalence), the readability of the instrument (technical equivalence), and the construct of the concept (concept equivalence) in accordance with the minimum criterion.

Back-translation is a well-known method to maintain equivalence between the original and translated version (Behling& law, 2000 as cited in Cha et al., 2007). The ideal was that corresponding tasks/items had similar meanings and similar form of language. At this time few problems were identified and evaluated those problems. For example, in the task 30 (expressive communication), the original version was worded "uses different word combinations: noun +verb + location". While the back-translated version stated that "uses different word combinations: noun + location + verb". This was clearly not the same. On reevaluation, it was found that the Bangla translation was reliable because noun +verb + location structure is not usual in Bangla grammar. So the Bangla version was left unchanged. Task 29 (auditory comprehension) also brought difficulty. The intent of the task was to

understand use of objects. One of the items/tasks was “show me what you use to cook food”. The picture of stove used in the original PLS-4 was not culturally appropriate. Most of the parents also reported that their children are not familiar with the stove of the original PLS-4. So the picture of the stove was used which is culturally appropriate. After the back translation it was observed the translated words, picture and objects were deviated. But the tasks reflected the intent of the scale. Finally, the translated version was revised and a valid pilot version was formed.

Cronbach’s Alpha score was 0.941 which is very high and indicates strong internal consistency among the 18 tasks. Essentially this means that respondents who tended to select high scores for one task also tended to select high scores for the others; similarly, respondents who selected low scores for one task tended to select low scores for the other tasks. The Bangla PLS-4 version showed good reliability overall on the test-retest tasks, with significant p values and it was <0.001 .

Limitations

The process of cultural validation of an instrument ought to be for the whole country. A massive number of participants and thorough methods needed to incorporate for achieving that goal. Considering the time boundary it was extremely challenging. Therefore the adaptation was made for certain two villages of Savar city in Dhaka district. In the field of research on language development, to view a clear picture of developmental progression wider age ranges was needed (Moyle, et al., 2007). In this study only one year age range (2-3 years) was used. Another limitation of this study was the participants were drawn by middle class family background from two villages. Language development is influenced by the social classes, culture and way of interaction (Rice, et al., 2008). So, if there were participants from all social classes then the result could be more realistic.

At the beginning of the translation process it was not easy to find suitable translators, particularly for the back translation. Again each translator took enough amount of time to translate. Furthermore, while working with the children during observation there were some difficulties. It was hard to manage the children as the researcher was stranger to the children. Sometimes children were more motivated to play with the pictures and objects rather than follow the researcher’s

instructions. Here, in this study, it was overcome by providing the children a quiet, comfortable room reducing the distracting elements, establishing rapport before starting formal observation. Researcher also placed only the material in front of the children that was needed, provided break time and involved the parents during the session. Researching evidence of validity was a rigorous process and collective effort which was not possible to achieve in short period of time. Therefore, this study was aware of the limitations of the validation process. There was no gold standard available in the country to measure children's language development.

For standardization, it required large population with enormous data from different location, socio-economic condition, ethnicity, and huge amount of funding. These brought barrier for the external validity. The researcher recommended further psychometric testing in larger samples using caregivers to establish further reliability and validity. As for the adapted version of the instrument, it might conclude different diagnosis and interventions, but without any set norms, interpretation should make with cautions. In this study only a portion of the instrument had been adapted for certain two villages of the country, where specifically the longitudinal cohort study need to be conducted. With this, the instrument became ready to be used for further studies in poor villages. Nonetheless, the procedure used in this study could inspire other researchers in emergency settings to minimal address issues of local validity, when more thorough methods were unfeasible due to constrains in time and resources. A valid instrument for assessing language development of pre-primary and primary school children would be helpful for multiple purposes. However, while working in the two villages, there was always an imbalance between western facts and other systems, complicating cultural research, even if it was community-based.

Conclusion

Adaptation and validation of the Bangla version of a scale to measure children's language development showed evidence of validity and reliability. Based on the methodological process for translation and back-translation, the Bangla version of PLS-4 short form appeared to have concrete validity and reliability to use in measuring language development in two villages in Bangladesh. Nevertheless, this study

serves as an initial step towards appropriate cultural and linguistic adaptation and translation of language development measurement instrument. Although the study findings might not be representative of the whole population due to limited number of participants and non-randomization of the participant's selection, in this context, this study can be used as a baseline document for further studies of language development in Bangla speaking children, including children with communication difficulties.

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