Development of Tests for Scaling Malayalam Reading Comprehension of School Students
Abdul Gafoor, K*., & Aneesh, N. V**

*Professor, Department of Education, University of Calicut.
**Research Scholar, Sanskrit Vyakarana, S.S. University, Kaladi, Kerala, India

Received: 23 Nov 2018
Revised: 30 Nov 2018
Accepted: 11 Dec 2018

Keywords:
Battery of tests, Gender, High school, higher secondary, Kerala, Literacy, Reading skill, Scale of reading, Upper primary

Abstract

This study designed a reading comprehension scale in Malayalam for school students from upper primary to higher secondary level with grade and gender norms. For this, a series of grade-wise tests with multiple choice items were developed. The Planning for the test, and Item writing, scoring, Item analysis, grade wise norms and Reliability and Validity are described. Students who follow Kerala state school syllabus in Malappuram and Kozhikode districts were used as the sample. It appears that reading comprehension proficiency in Malayalam falls as the students advance from upper primary through high school to higher secondary classes.

© 2018 Guru Journal of Behavioral and Social Sciences

Context

Malayalam is one among the 22 scheduled languages of India and one of the four major Dravidian languages of south India and the official language of Kerala. It is spoken in the union territories of Lakshadweep and Mahe as well. It is mother tongue for more than four crores of people around the world. Proficiency to speak, read and write mother tongue is a condition for development of a person, in and off the school. Speaking begins before schools; but reading and writing are among the primary tasks of school. Reading opens the door for meaningful writing, and to the learning of other languages, skills and subjects. Hence, those who are unsuccessful in reading face difficulty with schooling in general.

Nations and states need educated citizens. Literacy is a human right, a tool of personal empowerment and a means for social and human development. Educational opportunities depend on literacy. In a way, reading is an important dimension of education and comprehension is a condition of education in school and beyond. Reading is “the capacity to understand, use and reflect upon written texts in order to achieve one’s goals, to develop one’s knowledge and potential, and to participate in society” (Stacey, 2005). It is an irreplaceable instrument which allows people to acquire knowledge and hence of both academic and social value. The more and better people read, the greater their ability to perform the most wide-ranging tasks of community life and the higher their level of literacy will be. This is a fundamental condition of economic development, cultural enhancement, democratic quality and international assertion (UNESCO, 2005).

Both word recognition and comprehension are major aspects of reading. Accordingly, reading requires (Munby, 1968) recognizing the script, deducing the meaning, understanding explicitly stated and not explicitly stated information, understanding conceptual meaning and communicative value (function) of sentences and the relations within the sentences, understanding the relations between the parts of the text through lexical and grammatical cohesion devices, recognizing and interpreting indicators in discourse, distinguishing the main idea from supporting details, extracting salient points for summarizing, and selective extraction of relevant points from a text. It involves also basic reference skill, skimming, scanning to locate specifically information and transcoding information to diagrammatic
Reading as a thinking process of reconstructing author’s meaning (Goodman, 1970) enhances understandings and lead to discovery of new insights. This complex mental process begins with word recognition, involve comprehension and leads to creation and application. Surely it is a complex skill involving the use of a number of simultaneous operations more than fluent, accurate recognition of words.

Relevance of the study

Reading Comprehension is central among reading skills and hence is neither the beginning nor the end of learning to read. Comprehension or understanding is an absolute necessary in all reading. It is understood as a product of communication that results from interaction between the readers and writer (Kingston, 1961) and involves a variety of skills. Merely knowing the codes, recognizing words is not reading. Reading is both an analysis of connected logical discourse (Frederiksen, 1972) and an information processing (Chase & Clark, 1972).

Despite the importance of mother tongue reading comprehension for learning in school and beyond, it is not duly emphasized even at primary stage of education. Basic school pupils from some countries have severe problems when it comes to reading comprehension (OECD, 2001, 2004, 2007). Hence, knowing how to read and write a simple sentence, in a comprehensible manner, regarding daily life, which is the minimum requirement to be considered a literate individual, is an unattainable goal for almost a fifth (18%) of the world population. The fact is that around 770 million adults do not have basic literacy skills (UNESCO, 2005).

In Kerala too, the situation of reading is not healthy. Modest estimates of reading related difficulties in students of the same level were 16 per cent; Difficulty with comprehension reading is shown by 46-56 per cent of grade 5 to 7 students in Kerala (Gafoor, & Kaleeludeen, 2009). Low levels of reading comprehension in English for Standard VII studying the State syllabus (Jaise, & Joseph, 2018) with extreme variations among the subsamples. While gender subsamples revealed similar performance in English reading comprehension, subsamples based on medium of instruction demonstrated marked differences.

Potential Use of the scale

Identification of poor readers is difficult though severe reading difficulties are easily identified by teachers through observation and reading tests. A scale of reading test items have many values. They clarify proficiency in reading of students for students, parents, teachers, counsellors, and education administrators and policy makers. Such scaled battery of items are indicative of the growth that students have to acquire through school grades to become progressively literate. A reading scale create awareness among students on their reading ability, helps teacher with stages of student’s development of reading and to understand what progression looks like in reading, help schools to provide an environment that supports children’s development as readers (Centre for Literacy in Primary Education, 2016), aid educators and counsellors to make suggestion for teachers, support planning curricula that take children into the range of their development and give a common framework for communication among stakeholders.

Construct of Reading Comprehension

Reading skills are closely related to one another and with other academic skills even beyond languages. Reading skills like understanding vocabulary in context, identifying main idea, noting details, making inference, predicting outcomes, and drawing conclusion (Imam, Mastura, Jamil, & Ismail 2014), impacts performance in science and mathematics though
differently in public and private schools (Imam 2016). Vocabulary, and ability to read and comprehend, word problems are important factors affecting achievement in mathematics, and hence poor language skills do correlate with poor math skill (MacGregor & Price 1999). There is significant relationship between reading comprehension and academic achievement in English among the selected higher secondary students (Menaka & Jebaraj, 2017). Knowledge in vocabulary and its size and depth is a direct factor resulting in reading comprehension (Qian, 1999; Meara & Jones 1988), even in L2 ((Lervag & Aukrust 2010).

Multiple international studies reveal relation reading comprehension with an array of word related competencies and with performance in other school subjects. Though higher-level skills including reading comprehension, vocabulary and print exposure are partially dissociable from lower-level skills including decoding and spelling in adult readers (Landi, 2010) is clear, especially among school children there is a linear relationship between the percentage of vocabulary known and the degree of reading comprehension (Schmitt, Jiang & Grabe, 2011). Word decoding, vocabulary and prior topic knowledge predict reading comprehension of language-minority students in Norwegian 5th grade classrooms (Ryland, Aukrust & Fulland 2012). Word decoding, and vocabulary made a small and marginally significant unique contribution to Urdu reading comprehension (Lervag & Aukrust, 2010) as well. Likewise, exposure to print made a small unique contribution to reading comprehension which implies that, as well as being related to word identification; it may be associated with other factors, such as familiarity with narrative structure (Cain, & Oakhill, 1996). Exposure to print was significantly positively correlated with irregular word reading. Previous exposure to irregular words is crucial when words are presented in a list rather than as part of a sentence since contextual factors cannot be used to facilitate performance and phonological decoding alone will be unlikely to yield the correct answer for many words. Inference making and comprehension monitoring as component skills explained their own unique variance in reading comprehension of children aged 8, 9, and 11 years (Cain, Oakhill & Bryant, 2004).

Tests of Reading Comprehension in Malayalam

There is no existing reading comprehension scales in Malayalam which can be used across the levels from primary to higher secondary schools as the available instruments are either limited to a single grade only and or inadequate in psychometric evidences; some are too lengthy and cumbersome. This study is in response to noted weaknesses in the existing reading comprehension assessments tests in Malayalam and is to plan, design and to attempt a pilot psychometric validation of the preliminary version of the newly designed test through item testing, and reliability estimation. The tool for the study is a battery of tests of reading comprehension in Malayalam. Scale is a battery of test of reading comprehension, designed to identify a student’s position relative to grade mates, for students from grade 5 through grade 12. Reading passages contain Description, Narrative, Exposition and Argumentation and require test taker to engage in cognitive behaviours as specified by revised taxonomy of cognitive objectives in comprehending them. Reading comprehension in this study denotes ability in reading and comprehending Malayalam language, and the related cognitive skills including summarization, prediction and inferring word meanings from context.

Method

Normative survey is followed up with scaling and test of significance of difference between means. A series of successively set grade appropriate tests were used to measure and assign grade wise percentile scores on reading comprehension for students from grade 5 through grade 12. Gender status, and grade level (standard in which the student is studying)
Participants

For this study Students from grade 5 through grade 12 in school affiliated to directorate of public instruction and directorate of higher secondary education, Kerala state were sampled from Malappuram and Kozhikode districts. Total sample is 1313 students Upper primary, high school and higher secondary students from 12 schools were drawn using the proportionate stratified sampling giving due representation to factors like sex of the student, locality of school and type of management. Hundred students each were sampled from grades 5, 6, 8, 11, and 12; 37 samples each were sampled from grades 7 and 9. Only 72 students could be drawn from grade 10 due to practical constraints. Gender ratio was practically 1:1 in every grade.

Instrument development

A test that can be administered in 45 minutes for each grade level is planned. Grade appropriate reading comprehension tasks namely reflecting on information in the sentence, developing interpretation, reflecting on the nature of content and reflecting on the text as a whole were included for every grade. Accordingly blueprint were prepared. Poems, stories argumentations and statements in text books of Malayalam and Social Science and question papers of various grade levels for academic year 2017-2018 were analyzed. Passages, poems, statement, sentences and imagination works are selected from different old textbooks of Malayalam grade 5 to 12 and newspapers. Test for every grade had Descriptive, Narrative, Exposition and Argumentative passages. The 143 multiple choice test items in the draft reflected cognitive objectives advocated by Bloom and colleagues as some items were included in test meant for multiple grades.

Scoring and Administration

Before the administration of the test, its purpose is made clear to the subjects. The test included all necessary guidelines about test Item analysis. Scoring is true =1 false =0.

Try out and item analysis

The draft test was tried out on a representative sample of 100 students of each standard, except in classes 7 and 9 which had sample of 370 and 375 respectively. Item analysis was carried out using upper and lower quartile group. Procedure advocated by Ebel (199) to calculate the difficulty index and discriminating power was applied. Items with difficulty index between 0.4 and 0.6 and discriminating power more than 0.4 are retained.

Finalization of the test

The final test contains total of 97 items with 22 items per test meant for each grade from 5 through 12. Test for every grade contain a few items included in the test for previous grade level and another few items included in the test for next grade (denoted as -1 level, 0 level and plus1 level). Grade 7 and 9 tests contain -2 level items and +2 level items as well. The duration for the test was 45 minutes. The maximum score is 22 and the minimum is zero.

Norms

Norms for the battery of tests on reading comprehension in Malayalam in terms of grade and gender were developed.
Table 1. Cut point scores for six groups from lowest to highest reading comprehension

<table>
<thead>
<tr>
<th>Reading comprehension test</th>
<th>10th percentile</th>
<th>First quartile</th>
<th>Median</th>
<th>Last quartile</th>
<th>90th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 5</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Grade 6</td>
<td>5</td>
<td>8</td>
<td>14</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Grade 7</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Grade 8</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Grade 9</td>
<td>6</td>
<td>8</td>
<td>13</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Grade 10</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Grade 11</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Grade 12</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>14</td>
</tr>
</tbody>
</table>

Whether a student is average, above average or below average as per score on the grade appropriate test of reading comprehension can be quickly read from the Figure 1 which shows means plot reading comprehension with error bars of 95 % confidence interval for each grade level.

Figure 1. Mean scores of reading comprehension in Malayalam of school students from Grade-5 to Grade 12 in Kerala with error bars of 95 % confidence interval.

Using this graph one can instantly read whether a reading comprehension score obtained by a student is significantly less or significantly more than the average student in his/her grade. One take from the figure is that reading comprehension proficiency in Malayalam falls as the students advance from upper primary through high school to higher secondary classes.

Ogives of reading comprehension in Malayalam in Figures 2, 3 and 4 show the scores of Malayalam reading comprehension of students in upper primary, high school and higher secondary school grades in Kerala. Percentile score of any student score can be read from these ogives.
Figure 2: Graphical representation of distribution of scores of Malayalam reading comprehension in upper primary grade students

Figure 3. Graphical representation of distribution of scores of Malayalam reading comprehension among high school students
Figure 4. Graphical representation of Distribution of Scores of Malayalam Reading Comprehension among grade higher secondary school students

Gender norms by Grade
There is no gender difference in Reading comprehension in Malayalam of students in:
- Grade-5 [girls: M=13.76, SD = 5.26, N=51; boys: M=12.87, SD=4.71, N=49, t= .89, p>.05],
- Grade 7 [girls: M=11.33, SD = 2.27, N=66; boys: M=11.15, SD= 2.42, N=33; t=.36, p>.05],
- Grade 10 [girls: M=12.55, SD = 3.65, N=49; boys: M=11.11, SD=3.21, N=17; t= 1.52, p>.05]
  and
- Grade 11 [girls: M=9.44, SD = 3.74, N=52; boys: M=8.79, SD=3.92, N=49; t = .84, p>.05].
But, girls have significantly higher mean score in Malayalam Reading comprehension than boys in:
- Grade-6 [girls: M=15.25, SD = 4.42, N=55; boys: M=10.08, SD= 4.93, N=45; t= 5.45, p<.01],
- Grade 8 [girls: M=13.54, SD = 4.91, N=46; boys: M=9.52, SD= 4.24, N=53; t= 4.31, p<.01],
- Grade 9 [girls: M=15.48, SD = 5.31, N=49; boys: M=10.66, SD= 5.56, N=51; t= 4.36, p<.01] and
- Grade 12 [girls M=10.81, SD = 4.17, N=53; boys: M=8.80, SD= 3.50, N=47; t= 2.60, p<.01].
As there’re gender difference in reading comprehension, for more accurate interpretation of raw scores of boys and girls, gender norms were developed. Using the grade and gender wise box plots in figure 5, any score obtained on tests of reading comprehension in Malayalam for students in grades 5 to 12 can be scaled as high, average, or low reading comprehension compared to their grade mates of same gender.
Figure 5. Mean scores of reading comprehension in Malayalam of school students from Grade-5 to Grade 12 in Kerala with error bars of 95% confidence interval by gender.

Validity

Content validity

Test items were subjected for expert’s evaluation who testified that the test content covers the significant concepts and is comprehensive enough in terms of the objectives of reading comprehension skills in each grade.

Figure 6. Mean percentage scores of students on items of Malayalam reading comprehension of various Grade levels
Figure 6 contain mean percentage score of students on items of various grade levels. On each level, means scores of items on grade minus 1 level, 0 level, grade plus 1 level and grade plus two level are indicated. It is evident that items which were two grade levels above the student’s level scored markedly less than items that are the student’s level. Likewise, in most of the cases items which were one grade level below the student’s level scored markedly more than items that are at the student’s level. Items which were two grade levels below the student’s level scored markedly higher than items that are the student’s level. Likewise, in most of the cases items which were one grade level below the student’s level scored markedly higher than items that are the student’s level. This among other things evidences that the Malayalam reading comprehension test items has grade appropriateness and validity.

Reliability
Test used for measuring reading comprehension in each grade have high internal consistency as indicated in high reliability coefficients obtained through estimation of reliability using split half-method (0.75-0.96) and coefficients of Cronbach’s alpha (0.78-0.94). The reliability estimated were as in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Grade</th>
<th>Split half method</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>.91</td>
<td>.91</td>
</tr>
<tr>
<td>6</td>
<td>.96</td>
<td>.94</td>
</tr>
<tr>
<td>7</td>
<td>.96</td>
<td>.90</td>
</tr>
<tr>
<td>8</td>
<td>.83</td>
<td>.84</td>
</tr>
<tr>
<td>9</td>
<td>.91</td>
<td>.90</td>
</tr>
<tr>
<td>10</td>
<td>.75</td>
<td>.78</td>
</tr>
<tr>
<td>11</td>
<td>.75</td>
<td>.84</td>
</tr>
<tr>
<td>12</td>
<td>.83</td>
<td>.85</td>
</tr>
</tbody>
</table>

Conclusion
This study developed a battery of tests usable for scaling the reading comprehension in Malayalam among students from Grade 5 through Grade 12. The battery has 97 items in all and the test for each grade is composed of 22 items which can be completed in 30 minutes. The item formats and content are grade appropriate. Pilot psychometric validation of the preliminary version of a reading comprehension scale in Malayalam for school students from grade 5 through grade 12 was done through item testing, and estimation of reliability, and deriving grade and gender norms on a representative though small sample of students. The study encompass three levels of school in Kerala. The tests developed could be used for similar grade students of other curricular streams. The findings derived from this study, though will be largely tentative, can be used as the starting point for more adequate and extensive research of this type. Malayalam reading comprehension scale developed as part of this study can be exercised in schools. The newly developed grade appropriate battery of tests can serve as classroom screening test for locating students who need remedial assistance and encouragement in reading Malayalam. Higher grade level students have more unsatisfactory
level of reading comprehension in Malayalam. There is an urgent need to put special attention on student’s level of reading comprehension in Malayalam.

References


Landi, N. (2010). An examination of the relationship between reading comprehension higher-level and lower-level reading sub skills in adults. Reading and Writing. 23(6), 701-717.


