



The Phonological Awareness Scale of Early Childhood Period (PASECP) Development and Psychometric Features*

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Abstract

This study has two main aims. The first aim of the study is to develop a scale for determining early childhood period phonological awareness skills, and to put forward the validity-reliability of this scale. The second aim is to determine the norm values of this scale developed for the Marmara Region. For this reason, the research has been carried out with a general screening model. The validity and reliability of the items developed, consisting of seventy eight items, are tested with the study group which is comprised of 60-72 months old children. In the norm study of the research, the target population is composed of children at 60-72 months age range residing within the cities of Istanbul, Bursa, Balıkesir, Kocaeli and Çanakkale located in the Marmara Region, and receiving education in pre-school institutions in the school year from 2011 to 2012. In addition, 27 children who do not receive pre-school education are selected to determine the structural validity of the scale developed. Thus, the number of samples reaches 733. Factor loads of the seventy eight items containing within the 8 factors determined prior to the research in the sub-factor they take place are between the range of .30-.84. Test-retest coefficients of the scale vary between .975 and .433. Internal consistency coefficients of the total grades of the scale is between .9611 [Cronbach alpha] and .8474 [Guttman]. As a result, it is accepted that the psychometric feature of the scale is sufficient. As a result of the norm analyses of the research, it is put forward that phonological awareness skill tends to correlate with the increasing socio-economic status of parents.

Key Words

Early Childhood Period, Early Literacy, Phonological Awareness, Validity and Reliability Study, Norm Study.

How people acquire the skill of reading which enables the system of signs to turn into meaningful writing and makes the world around us meaningful is a subject of wonder. Reading is the process of processing a piece of information which transforms from writing into meaning. A person

who has successfully learned to read can make this transformation cognitively in an effective way (Coltheart, 2010, p. 6). Skills which constitute the basis of the process of literacy in early childhood period are skills such as alphabet knowledge, phonological awareness, the concept of writing and

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the use of writing as a means of communication (Raisor, 2006; Swan, 2008; Wasik, Bond, & Hindman, 2002). One of the most important factors in the process of learning to read-write is children's developing awareness towards the phonological features of their mother languages (Beaty & Pratt, 2010; Riley, 2006). Skills belonging to phonological awareness are measured by items for sound unit elements, beyond the meanings of words (Goswami, 2002; Liberman, 1973).

Phonological awareness is not reading words; to the contrary, it is working with sounds separately from written symbols. Children realize the sounds in their mother languages by singing, paying attention to rhyming words and by forming rhyming words (Beauchat, Blamey, & Walpole, 2010; De Cara & Goswami, 2003; Goswami & Bryant, 1990). Phonological awareness is being able to replace a phoneme in a word with another phoneme, adding phoneme to words and omitting phoneme from words, being able to form new words by combining phonemes and being able to divide words into smaller phonemes (Aktan, 1996; Anthony & Francis, 2005; Blevins, 2006; Gillon, 2004, p. 4; Lane & Pullen, 2004; Yopp & Yopp, 2009).

Phonological awareness is defined as an important skill in the process of learning to read (Ehri, Nunes, Stahl, & Willows, 2001; Erdoğan, 2009; Shankweiler & Fowler, 2004; Morris, Bloodgood, & Perney, 2003; Whiteley, Smith, & Connors, 2007; Yücel, 2009). Focusing children's attention on phonemes starting from an early age is important in the process of preparing for reading-writing. Supporting children with activities aimed at phonological awareness in this process strengthens the bond between grapheme and phoneme (Acarlar, Ege, & Turan, 2002; Dahmer, 2010; Goswami, 2002; Goswami & East, 2000; Westwood, 2008).

When research on this subject is examined, in a study carried out by Lundberg, Larsman, and Strid (2012) on 2000 children at the age of 6, an eight-month-long phonological awareness program was implemented and its effect of reading development was researched. The program includes activities at different difficulty levels containing skills aimed at listening to sounds, distinguishing between the first and last sound, dividing the word into its phonemes. As a result of the research, it was put forward that phonological awareness is a skill which can be taught and changed. In addition, the effect of the intensity of the education given to the development of phonological awareness was also examined in the research.

When research into this field was first conducted in Turkey, a study was carried out by Aktan (2001) (during the 1999-2000 academic year) with the aim of putting forward the effect of the Reading Preparation Program for children aged 5-6 years old to assess their reading development. The sampling of the research comprised a total of 26 children in Istanbul at medium socio-economic level. In this research, "Phonological Awareness Tests" which were developed by Yopp (1988) was used for measuring phonological awareness skill. The adaptation of the test into Turkish was completed by Aktan (1996). As a result of the activity, the student group which received the Reading Preparation Program exhibited immense progression in the aforementioned skills compared to the group who did not receive such education.

In a research made by Turan and Akoğlu (2011), on the effect of phonological awareness education in the process of preparing for reading-writing and on the skill of reading was analyzed. In this research, the contribution of phonological awareness education given to children in pre-school period to the children's phonological awareness development, articulation and auditory discrimination skills was examined. In the pre-test and post-test stages of the research, Ankara Articulation Test, Auditory discrimination Test and Phonemic Awareness Skill Checklist (PASC) were used. As a result of the research, significant degrees of differences were found between the experiment and control groups.

In Turkey, National Preschool Education Programme (Milli Eğitim Bakanlığı, 2012) has emphasized on importance of phonological awareness in early childhood education. When scales used in researches made on phonological awareness are examined, it is seen that there are not many scales made in Turkey, and research aimed at early childhood period is lacking. Furthermore, it is important that widespread use of a measurement tool the reliability and validity studies of which has been completed be ensured to be used and norm analyses of the tests developed are made so that grades obtained from this measurement tool can be used in individual-individual, individual-group, group-group comparisons (Sodoro, Allinder, & Rankin-Erickson, 2002).

The aim of this study is developing The Phonological Awareness Scale of Early Childhood Period (PASECP) and to make the validity, reliability and norm analyses of the scale. In connection with this aim, the following questions were sought to be answered in the research:

- 1) Are the items of The Phonological Awareness Scale of Early Childhood Period (PASECP) valid and reliable?
- 2) What are the norm values of The Phonological Awareness Scale of Early Childhood Period (PASECP)?
- 3) Does phonological awareness of early childhood period children vary depending on the socio-cultural features they and their families have?

Method

Research Model

General screening model is used in this research, which aims at developing a measuring tool to determine the Turkish phonological awareness levels of children at early childhood period (60-72 months) and making the validity, reliability and norm study of this scale. Karasar (2008) defines the general screening model as a means of revealing past or present state of a phenomenon.

Population and Sample

In order to determine the validity and reliability of The Phonological Awareness Scale of Early Childhood Period (PASECP) used within the scope of the research, various study groups living in the Marmara Region and being at 60-72 month range in 2011-2012 school year were used. In the first stage, data were collected from 106 students continuing pre-school educational institutions within the borders of the city of Çanakkale in 2011-2012 school year to calculate the factor analysis and internal consistency coefficients of the scale.

In the norm study of the research, the target population was composed of children at 5 to 6 years of age residing within the cities of Istanbul, Bursa, Balıkesir, Kocaeli and Çanakkale located in the Marmara Region and receiving education in pre-school educational institutions in 2011-2012 school year. It was decided that proportional cluster sampling method could be used according to the cities and school types comprising the target population and 0.5% of total number of schools could be reached. As a result of this, aforementioned schools were taken and schools which were needed to be reached were determined by random sampling method among schools within the framework of the proportion as determined (the 5 to 6 year olds receiving education in these schools were included in the sampling group). In order to detect the

structural validity of the scale, 27 children who did not receive pre-school education were chosen from these schools by random sampling. Together with this, the sampling number reached 773.

Data Collection Tools

The Phonological Awareness Scale of Early Childhood Period (PASECP): The Phonological Awareness Scale of Early Childhood Period (PASECP) contains eight sub-dimensions of phonological awareness. There are 8 test items in the first sub-dimension and 10 test items each in other sub-dimensions making a total of 78 test items. The sub-dimensions of the scale are recognizing rhyme, beginning sound detection, generating new words related to the desired phoneme, grouping words starting with the same sound within a group of words, blending phonemes, segmenting word into its syllables, omitting a word in a compound and alphabet knowledge. The test is administered individually to students. Administration period lasts for approximately 15 minutes for each child.

Analyzing Data

It is aimed that a test is valid at the first stage. With this aim, firstly the scale which was prepared was sent to five academics specializing in the relevant subject, and information was obtained regarding whether the scale items measure information related to phonological awareness. As a result of feedback received from specialists, it was understood that the scale has content validity. For the validity of the test, structural validity was sought in the second stage. With this aim, factor analysis transactions were made with varimax rotated method. The sub-dimensions of the scale were determined as a result of this transaction. Statistically meaningful correlations between the sub-dimensions and total points obtained from a test with high structural validity are required.

In the second stage, the scale must prove reliable. The first way in determining the reliability of tests is test-retest reliability. With this aim, the test was administered twice to a group with one week interval and the correlation coefficient between the grades obtained was calculated. This coefficient was accepted as the continuity coefficient.

The internal consistency to determine reliability of the test was demonstrated using two different methods. In the first method, Cronbach Alpha coefficient was found based on the variant of each

question. Then, test questions were divided into two halves and Spearman Brown and Guttman internal consistency coefficients were found based on the correlations between the two halves.

At the last stage of reliability, item reliability coefficients were determined with *item total* and *item remaining* techniques. In addition to these, distinctiveness values of each test item were determined in item analysis procedures. Internal consistency coefficient is used for detecting the consistency of the responses given to the test items. Within this context, the high homogeneity feature of the test indicates that test items aim at measuring the same structure (Öner, 1997).

At the third stage of the test, criteria validity of the scale was examined. With this purpose, Phonological Awareness Tests and The Phonological Awareness Scale of Early Childhood Period (PASECP) were used for the same group and the statistical meaningfulness of Pearson Multiplication Moments Correlation Coefficients calculated between two scale points was tested.

Finally, norm study procedures were started. After it was understood that distributions were normal, it was decided that parametrical statistical techniques be used for determining PASECP total and sub-dimension differences according to the various independent variables collected with survey. In cases when the independent variable is comprised of two categories, unrelated group “t” test was applied as hypothesis test; in cases when it is comprised of more than two categories, One-Way Analysis of Variance (ANOVA) procedures were applied. In ANOVA procedures, in cases when descriptive statistical values, Levene test, eta square values were used and in cases when there were meaningful differences in “F” test; in cases when variances are homogenous in Levene Test ($p > .05$) Scheffe test was used as Post-Hoc technique; in cases when variances are heterogeneous ($p < .05$) Tamhane tests were used as Post-Hoc technique. Within the scope of the research, all results were tested bi-directionally and meaningfulness level was accepted as minimum .05. All statistical procedures of the research were carried out in the SPSS package.

Content Validity of PASECP

One way of statistically determining the content validity of a test is to determine the distinctiveness power of the test (Büyükköztürk, 2007). In order to achieve this, all individuals were ranked from highest to lowest according to the grades obtained

from total and sub-dimensions of the scale. Then, the number of people forming the 27% range of the study group was determined. The difference between arithmetic means between the 27% group which received the highest grade and the 27% group which received the lowest grade from total and sub-dimensions of the scale was tested with the unrelated group “t” test. It was understood that all of the distinctiveness procedures made for total and sub-dimension total points gave meaningful results at the level of .001 statistically. Based on this result, it can be seen that content validity of PASECP is high.

Structural Validity of PASECP

As first procedure within the framework of factor analysis, Kaiser-Meyer-Olkin Value was found. Scientifically, if the Kaiser-Meyer-Olkin Value is above .50, this indicates that the sampling size whereby the validity of the scale is tested is appropriate for making factor analysis. Kaiser-Meyer-Olkin Value was found as .647 for PASECP. Based on this result, it was decided that the sampling size was sufficient. As Barlett test result gave statistically meaningful result at the level of .001, it was understood that there was a multi-dimensional feature in the population parameter of the feature measured with the scale. Factor analysis procedures made according to Kaiser-Meyer-Olkin and Barlett test results obtained can be interpreted statistically.

In this study, while making factor analysis procedures, firstly six sub-dimensions of PASECP were determined theoretically and factor analysis procedures were realized based on these eight factors. In factor analysis which was made with Varimax rotation technique, eigenvalues of eight sub-dimensions were obtained as a lot higher than the expected 1.00 (minimum 3.823).

The last of factor analysis procedures was the procedure of determining the factor loads of each item contained in the scale in sub-dimensions determined with factor analysis. It was understood that factor loads of all items contained in the eight factors determined prior to the research in the sub-dimensions they exist was above .30. For this reason, it was decided that all of the 78 items contained in the scale remain within the scope of the scale.

Test-Retest Validity of PASECP

In order to determine the test-retest reliability of PASECP, the scale was administered three to the 30-person study group with one week interval and

the correlation coefficients between the scale total and sub-dimension grades were calculated. Test-retest coefficients of total and sub-dimensions of PASECP varied between .975 and .433. Average of all continuity coefficients was .770.

Internal Consistency Validity of PASECP

Internal consistency of total and sub-dimensions of PASECP was calculated with two different methods (Cronbach Alpha, Guttman and Spearman Brown) based on data obtained from a study group of 106 people. Internal consistency coefficients of PASECP's total grades varied between .9611 (Cronbach Alfa) and .8474 (Guttman). According to scientific criteria, these results indicate that scale total has very high internal consistency reliability.

Results

Descriptive Statistical Values and Norm Results of Total Grades Obtained as a Result of Norm Study

78.3% of the research group is state school pupils and 18% at a private educational institution. 3.7% of the pupils do not continue any school. According to the variable of monthly income level of families, medium income level was in the first place (39.8%). This was followed by pupils from families whose monthly income level was lower than medium by 29.7%. The proportion of those with a monthly income that was higher than medium was 15.3%, and those whose families' income level was higher were at 7% distribution.

F values obtained as a result of statistical analysis made for general total grade averages of The Phonological Awareness Scale of Early Childhood Period (PASECP) according to the variable of economic level of family of the research group are statistically meaningful at the level of .001 in test total [$F_{(4,724)} = 40.428, p < .001$]. General grade averages of The Phonological Awareness Scale of Early Childhood Period (PASECP) according to the variable of economic level of family are different from each other. In dual comparisons made for general total grades of The Phonological Awareness Scale of Early Childhood Period (PASECP) according to the variable of economic level of family, the students' The Phonological Awareness Scale of Early Childhood Period (PASECP) tended to increase consistently with rising income levels.

Discussion

As a result of the research, it was detected that early childhood period phonological awareness of children who continue private schools were significantly higher compared to those who go to state schools or do not go to school. Early childhood period phonological awareness of children going to state schools is meaningfully higher than those who do not receive pre-school education. Studies were carried out by Barnett (2002) on the effect of different programs on phonological awareness. According to Barnett, the effect of Head-Start and state schools in the United States on children's reading success is lower compared to schools, which are supported better financially. The fact that state schools have less facilities seriously prevents activities aimed at the development and learning of disadvantaged children.

As a result of the analysis made for general total grade averages of PASECP according to the variable of economic level of the research group's family, grade averages of children the economic level of whose families is low are meaningfully lower than children of families with an economic level lower than medium, medium and higher than medium. In early childhood period, the effect of the family's socio-economic origin features on the success of the child, in addition to environmental factors, is significant (Bracken & Fischel, 2008; Britto, Brooks-Gunn, & Griffin, 2006; Saracho, 2001). Features of family and home environment, such as the family's income level, literacy level, reading habits, family-child interaction in preparing for literacy, impact greatly on the child's linguistic and reading-writing skills. The findings of the research regarding the socio-economic level of phonological awareness supports the studies carried out in this field (Akyol & Temur, 2008; Altıparmak, 2010; Bektaş, 2007; Burgess, Hecht, & Lonigan, 2002; Karaman, 2006; Taner, 2003; Weigel, Martin, & Bennet, 2006). According to findings obtained as a result of the study in which Taner (2003) compared "the linguistic development of primary school first grade students at different socio-economic levels who received or did not receive pre-school education", it was put forward that the socio-economic level variable of the family is effective in the language development of the child. As a result of the research, it was determined that linguistic development of students at medium and high socio-economic level was better than those of students at lower socio-economic level.

In the report of Program for International Student Success Assessment (PISA) aimed at reading skills in 2009, it is stated that 19% of the diversification in student success in Turkey is explained with the economic, social and cultural status differences between the students directly (Eğitim Reformu Girişimi, 2010). It is seen that when activities aimed at preventing the effects of socio-economic factors are not made, success of children in the following period stages are also affected. According to Education Monitoring Report (Eğitim Reformu Girişimi, 2010), the most effective way to decrease the determining effect of this diversification on student success is making quality pre-school education widespread. Early childhood period is very important in terms of equality in education as it gives the opportunity to intervene early in cognitive differences among children which might arise from socio-economic origin.

According to Whitehurst and Lonigan (1998), basic phonological awareness skills in pre-school period form the foundation for more difficult and more complex phonological skills which must be acquired in the following years. If the child starts formal education without these basic literacy skills, the development difference among his/her peers will increase as literacy skills become more complex.

As can be seen in the result of the research, the education and socio-economic level of parents are effective in the academic success of the child. For this reason, non-governmental organizations, universities and the state must work in collaboration and make literate families, especially in rural areas who are illiterate, and educate them in subjects related to their child's development; thus, bringing about positive change in the attitudes of parents towards literacy. In the globalizing world, the rate of literate people is important for the economic development of countries and it also increases the level of social cohesion. Within this context, what countries must do is increase the rate of reading and to monitor the development of this skill. This monitoring can be best made with Standard assessment tools which can be used both locally, at national and international levels. Results obtained from these evaluation tools must be used to improve literacy levels, and the collaboration between policy makers and educators alike is vital in ensuring the next generations of pupils have equal literacy standards.

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