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VALIDITY AND RELIABILITY STUDY OF PRIMARY SCHOOL MATURITY SCALE FOR TURKISH CHILDREN: ISTANBUL SAMPLE

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Abstract

One of the main goals of preschool education is to prepare the children for primary school. This preparation contains all developmental areas for the child within the framework of the skills thought to be necessary in primary education. Starting to 1st grade facilitates orientation of the children who have the maturity required for primary school. It is known that the adaptation problems of most children continue during the processes of academic success and schooling in primary school. The immediate determination of adaptation problems is required so that educators need to have assessment instruments for adaptation problems. The purpose of this study is to test the validity and reliability of an assessment instrument developed to determine the adaptation and academic levels of the students (reading-writing skills, problem solving, etc.) at the 1st grade of the primary school. For this purpose, the form constructed as a result of the literature search was presented to the evaluation of field experts. After making changes in line with the suggestions of the experts, a validity and reliability study was made with 520 1st grade students in Istanbul. The internal consistency coefficients and item analysis processes were performed for a reliability study of the Primary School Maturity Scale, while factor analysis and comparisons with different variables were made for its validity study. Results of this study show that Primary School Maturity Scale for Turkish Children is highly reliable and valid.

Keywords: Primary School Maturity Scale for Turkish Children, school maturity.

INTRODUCTION

The beginning years of life are the years during which children make the biggest progress in development and learning. Timely interventions made at critical points of development in this period will give significant positive support to progress. Oktay (2010) describes this period as a socialization period in which the child begins to become aware of him-/herself meets other people and learns social rules. According to Oktay (2010), the child first develops basic behaviors regarding socialization in the family, and afterwards reinforces these gains in the preschool institutions and primary education institutions.

Starting to school is one of the most important milestones in the life of a child. For the first time, the child is faced with tasks such as attending the activities required by the programmed instruction, obeying the rules within a specific discipline and plan, and learning the subjects such as reading-writing, arithmetics, etc. (Oktay and Unutkan, 2003, p. 145).

Having several competences when starting the 1st grade in primary school eases the child's adaptation to the class by allowing him to avoid long-term adaptation problems. According to Polat Unutkan (2007), to gain competencies such as leaving the house easily, self-dressing, doing personal cleaning, gaining toilet control, having responsibility, taking turns, finishing the task that they started, protecting themselves from dangers, moving in a balanced manner, making friends, expressing themselves, sitting up straight from a definite distance at the table, focusing attention on a certain point and following the instructions, and academic skills such as holding a pencil correctly, drawing a line, counting items, knowing the numbers, adding-subtracting, observing, establishing cause and effect relationships, solving problems, using Turkish correctly, setting the tone of voice and speaking speed, and forming words beginning and ending with the same sound by their teachers and parents at home as much as possible is important for all children regardless of their attendance in preschool.

All of these factors are accepted to have the same level of importance, since it is known that such factors are not independent from each other and any deficiency or insufficiency affects the others as well (Brown 2003; Esaspehlivan 2006). It can be said that individual factors such as cognitive, physical, social, and emotional maturity and school phobia, and environmental factors such as family and school affect the child's maturity for starting school (Kılıç, 2004).

Evaluation of school maturity has critical importance with regard to practice and theory (Miclea&Mihalca 2007). In our country, children are enrolled in primary school according to their chronological age, and any evaluation about the school maturity of the children cannot be made, especially in public schools. Considering the number of the students in the class, their school readiness, and attitude to school, is important in classroom atmosphere (Sadık, 2002). The children who adapt to school are careful, and participative and active in classroom activities. They can study independently and have high levels of academic success. In addition, such children establish close relationships with their peers and teachers (As cited in Gülay, 2011; Bart, Hajami & Bar-Haim, 2007; Buhs & Ladd, 2001). A valid and reliable evaluation during the orientation process shall be beneficial for both the students and their family. Such evaluation is important in providing the chance for early intervention as well. This study aimed to conduct of a psychometric test of Primary School Maturity Scale for Turkish Children which will be used to evaluate whether new 1st grade primary school students are ready for school or not.

METHOD

Research Model

General model of this research is a qualitative, descriptive study.

Sample

The population of this study consists of new 1st grade primary-school students in Istanbul. Primary schools of 10 counties (Avcılar, Beylikdüzü, Fatih, Güngören, Kadıköy, Maltepe, Sultanbeyli, Şişli, Ümraniye, Üsküdar) in both sides of Istanbul were determined for the sample through random sampling. The selection was made

between public primary schools that have at least 2 first-grade branches. For the sample of our study 520 students were selected from 50 schools that follow our school criterion.
The teachers of the sample (104) have evaluated their students.

Data Collection Tools

Information Form: This form was prepared by researchers to collect information about the sample. The Information Form contains questions about the field of specialization of class teachers, number of their students, preschool education status of the students, the month that the students started reading, their mechanical transition periods for reading, transition periods for reading conceptually, transition periods for accentuation, process of adapting to the syllabus, and orientation in order to collect information about the sample and the 1st-grade teachers in the sample.

Primary School Maturity Scale for Turkish Children: It was formed with 156 items and sent to 7 educators (5 academicians and 2 class teachers) working in their fields of expertise. The experts evaluated the scale items with regard to appropriateness. 33 items which were not approved contextually by the experts after the evaluation were excluded and a form consisting of 123 items was obtained. The teachers were requested to fill in this 123-item form according to a triple rating (do, partially do, cannot do) in consideration of the information, skills, and behaviors of the students. This scale was named as Primary School Maturity Scale for Turkish Children (PSMS-T).

FINDINGS

Findings about the sample and personal information regarding the class teachers and the findings about the validity and reliability test of the PSMS-T were shown below.

I-Findings about the Demographical Characteristics of the Sample

The distribution of 520 1st-grade students in the sample according to classroom size is shown in Table 1.

Table 1: Number of students in the classrooms of children within the sample

Class size	n	%
15 students	15	2,9
16 students	36	6,9
19 students	9	1,7
21 students	9	1,7
25 students	141	27,1
26 students	15	2,9
27 students	9	1,7
29 students	9	1,7
30 students	9	1,7
32 students	20	3,8
33 students	12	2,3
34 students	9	1,7
35 students	36	6,9
36 students	9	1,7
37 students	21	4,0
38 students	9	1,7
39 students	12	2,3

40 students	120	23,1
42 students	8	1,5
43 students	12	2,3
Total	520	100,0

As seen in Table 1, the students in the sample receive education in the classrooms with minimum and maximum capacity of 15 and 43 people, respectively. Of these students, 27.1% and 23.1% receive education in the classrooms with a capacity of 25 and 40 people, respectively.

Opinions of these students' teachers about their socioeconomic status were used in this study.

Table 2: Socioeconomic Distribution of the Sample

S.E.S.	n	%
Low	45	8,7
Below average	93	17,9
Average	355	68,3
Above average	27	5,2
Total	520	100,0

68.3% of the students attending the schools in the sample group have the average income level. This shows that a considerable part had the average income level, although the sample was distributed above and below this income level (Table 2).

Table 3 indicates whether or not preschool education had been received.

Table 3: Preschool Education Status

Preschool Education	n	%
received	295	56,7
did not receive	219	42,1
Unanswered	6	1,2
Total	520	100,0

56.7% of the students in the sample group had received preschool education, whereas 42.1% of them did not receive it (Table 3).

II-Findings about the Reliability and Validity Test of the PSMS-T

Internal consistency coefficients of the PSMS-T were calculated. In Table 4, internal consistency coefficients of the PSMS-T were given.

Table 4: Internal Consistency Coefficients of PSMS-T

	r
Alpha	,890
Spearman-Brown	,859
Guttman Split-half	,856

In order to test the reliability of the PSMS-T, Cronbach's Alpha, Spearman Brown, and Guttman split-half internal consistency coefficients were calculated. The Spearman Brown internal consistency coefficient calculated after the test was split in two halves itself, and Guttman split internal consistency coefficients

corresponded to 0.86 and 0.86, respectively. Cronbach's alpha internal consistency coefficient calculated based on the variance of each problem was found to be 0.89.

Processes of Item Analysis

After the internal consistency of the PSMS-T was determined, the item analysis processes began. Item-total, item-remainder, and item distinctiveness indexes were used as bases, respectively, during the item analysis processes.

When results of the **item-total** and **item-remainder** were used as bases, it was seen that items 93 and 96 were not reliable. On the basis of the test sums, the whole was sorted in descending order and **item distinctiveness indexes** were calculated with unrelated group t test by using the distinctiveness values of 140 people who received the highest score based on 27%, and 140 people who got the lowest score. According to the results of this process, the distinctiveness values of items 15, 93, and 96 are low. Except for these, all items were found to be distinctive.

Positive findings about the reliability of the scale were obtained through calculating the internal consistency of the PSMS-T and the item analysis processes.

Factor analysis was made for the validity study of the PSMS-T. Prior to factor analysis, KMO and Bartlett analysis were performed to determine the appropriateness of the sample group.

Table 5: Results of KMO and Bartlett Tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,837
Bartlett's Test of Sphericity	Approx. Chi-Square	1,192
	df	7503
	Sig..	,000

The appropriateness value of the Kaiser-Meyer-Olkin sample which is 0.837 and significance level of Bartlett's test for sphericity which is 0.000 (for p≤0.05) show that the data of this study are appropriate for the factor analysis (Table 5). Therefore, the factor analysis processes were performed to test the validity of the scale.

Table 6: Total Variance Explained Within the PSMS-T

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Companent	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	59,688	48,502	48,502	59,658	48,502	48,502

According to results of the factor analysis processes, the scale is constituted by a single dimension and explains 48.502% of the total variance (Table 6).

As a result of the factor analysis, Items 2, 15, 59, 93, and 96 were excluded from the total scale and the processes of item analysis were repeated.

A 118-item scale form was obtained after excluding 5 items from the scale, and the validity and reliability test was performed again.

Below are the findings about the validity and reliability analysis of the 118-item scale.

Table 7: Internal Consistency Coefficients Within the PSMS-T

	r
Alpha	,891
Spearman-Brown	,866
Guttman Split-half	,852

Internal consistency coefficients were calculated again for the 118-item scale. Spearman Brown and Guttman internal consistency coefficients correspond to 0.87 and 0.85, respectively. On the other hand, Cronbach's alpha internal consistency coefficient was calculated as 0.90 (Table 7). These results provide strong evidence showing the reliability of the test.

Table 8: Total Results of Variance Explained Within the PSMS-T

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Companent	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	59,488	58,414	58,414	59,488	58,414	58,414

According to results of the factor analysis processes which were repeated for 118 articles obtained after excluding 5 items, the scale is constituted by a single dimension and explains 58.414% of the total variance (Table 8).

In order to determine the validity of the 118-item PSMS-T, comparisons were made based on the variables (gender, preschool education status, starting to read within the projected period, mechanical transition periods for reading, transition periods for reading conceptually, transition periods for accentuation and process of adapting to the syllabus, and orientation) obtained from the sample.

Table 9: Results of the Variance Analysis According to Socio-Economic Variables or Not

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	34841,239	3	11613,746	3,947	,008
Within Groups	1518182,205	516	2942,214		
Total	1553023,444	519			

As seen in Table 9, a significant difference was detected as a result of the variance analysis made to determine whether the PSMS-T differ according to socio-economic variables or not (F=3.947; 01).

LSD test was applied to find the source of the difference, and it was seen that mean values of the children which were just above the mean income level were significantly higher than those of the children with low and medium income levels.

Table 10: Results of the Independent Group t Test According to the Variable of the Student's Gender or Not

Groups	N	X	ss	t	sd	Sig.
Female	273	,0300	55,27007	-,987	518	,324
Male	247	,0304	54,07051			

As seen in Table 10, the difference between the arithmetic means of the groups was found to be statistically insignificant (t=-.987; p=.324) as a result of the t test made to determine whether the PSMS-T differ according to the variable of the student's gender or not.

Table 11: Results of the Independent Group t Test According to the Variable of the Student's Preschool History or Not

Groups	N	X	ss	t	sd	Sig.
Received	295	,031	47,615	5,377	512	,000
Did not received	219	,029	60,422			

The difference between the arithmetic means of the groups was found to be statistically significant (t=5.377; p<0.01) as a result of the t test made to determine whether the PSMS-T differ according to the variable of the student's preschool history. The relevant difference was for the benefit of the students who received preschool education (Table 11).

Table 12: Results of the Independent Group t Test According to the Variable of Starting to Read Within the Projected Period or Not

Groups	N	X	ss	t	sd	Sig.
Yes	368	,032	36,875	15,118	506	,000
No	140	,025	62,834			

As seen in the table 12, the difference between the arithmetic means of the groups was found to be statistically significant (t=15,118; p<0,01) as a result of the t test made to determine whether the PSMS-T differ according to the variable of starting to read within the projected period or not. The relevant difference was for the benefit of the students who started to read within the projected period.

Table 13: Results of the Independent Group t Test According to the Variable of Switching from Mechanical Reading to Reading Conceptually Within the Projected Period or Not

Groups	N	X	ss	t	sd	Sig.
Yes	285	,033	19,550	19,419	500	,000
No	217	,026	59,410			

The difference between the arithmetic means of the groups was found to be statistically significant (t=19.419; p<0.01) as a result of the t test made to determine whether the PSMS-T differ according to variable of switching from mechanical reading to reading conceptually within the projected period or not. The relevant difference was for the benefit of the students who switched from mechanical reading to reading conceptually (Table 13).

Table 14: Results of the Independent Group t Test According to the Variable of Switching to Accentuation Within the Projected Period or Not

Groups	N	X	ss	t	sd	Sig.
Yes	281	,033	19,589	20,330	497	,000
No	218	,025	57,441			

As seen in Table 14, the difference between the arithmetic means of the groups was found to be statistically significant (t=20.330; p<0.01) as a result of the t test made to determine whether PSMS-T differ according to the variable of switching to accentuation within the projected period or not. The relevant difference was in favor of the students who switched to accentuation within the projected period.

Table 15: Results of the Independent Group t Test According to the Variable of the Student's Awareness of the Course Hours or Not

Groups	N	X	ss	t	sd	Sig.
Yes	391	,032	40,810	13,652	518	,000
No	129	,025	62,033			

As seen in the table, the difference between the arithmetic means of the groups was found to be statistically significant (t=13.652; p<0.01) as a result of the t test made to determine whether PSMS-T differ according to variable of the student's awareness of the course hours or not. The relevant difference was in favor of the students who were aware of the course hours (Table 15).

Table 16: Results of the Independent Group t Test According to the Variable of the Student's Awareness of the Syllabus Process at School or Not

Groups	N	X	ss	t	sd	Sig.
Yes	414	,032	38,637	16,221	518	,000
No	106	,024	62,740			

As seen in Table 16, the difference between the arithmetic means of the groups was found to be statistically significant (t=16.221; p<0.01) as a result of the t test made to determine whether the PSMS-T differ according to the variable of the student's awareness of the syllabus (first course, last course, etc.) at school or not. The relevant difference was in favor of the students who were aware of the syllabus.

Table 17: Results of the Independent Group t Test According to the Variable of Returning Home after the Orientation Period and Wanting Mother or Not

Groups	N	X	ss	t	sd	Sig.
Yes	137	,028	66,257	-4,509	518	,000
No	383	,031	48,466			

As seen in the table, the difference between the arithmetic means of the groups was found to be statistically significant (t=-4.509; p<0.01) as a result of the t test made to determine whether PSMS-T differ according to variable of returning home after the orientation period and wanting mother or not. The difference was in favor of the students who do not experience adaptation problems after the orientation period (Table 17).

RESULTS

The studies for developing the PSMS-T started with 156 items. Expert opinions were used for the first scale form consisting of 156 items. 33 items which were not approved according to expert opinions were excluded, and a 123-item scale form was obtained. Validity and reliability analyses of the 123-item scale form were performed. The scale took its final form with 118 items, after 5 items that were not found valid and reliable through the processes of item analysis and factor analysis were excluded. The Cronbach's alpha coefficient of the 118-item PSMS-T corresponds to 0.90. According to results of the factor analysis, the scale has a single factor and explains 58.41% of the total variance.

It was seen as a result of the comparisons made with the PSMS-T that arithmetic means of the students who received preschool education were significantly higher than those of the students who did not receive preschool education (t=5.377; p<0.01); no difference between the means scores of the female and male students was found.

Arithmetic means of the scale scores of students who started to read within the projected period were found to be significantly higher than those of the students who failed at reading within the projected period (t=15.118; p<0.01).

The arithmetic means of the scale scores of students who switched from mechanical reading to reading conceptually within the projected period were significantly higher than those of the students who failed at switching to read conceptually within the projected period (t=19.419; p<0.01).

It was seen that arithmetic means of the scale scores of students who achieved accentuation within the projected period were significantly higher than those of the students who could not switch to accentuation within the projected period (t=20.330; p<0.01).
Arithmetic means of the students who were aware of the course hours were observed to be significantly higher than those of the students who were not aware (t=13.652; p<0.01).

It was found that arithmetic means of the students who were aware of the syllabus process were significantly higher than those of the students who were not aware the process (t=16.221; p<0.01).

Arithmetic means of the students who wanted to return home after the orientation period and wanted their mother were significantly lower than those of the students who did not (t=-4.509; p<0.01).

In light of these results, it can be said that the maturity scale developed to assess whether the new 1st-grade primary school students are ready for the school or not has reliable results with regard to validity and reliability tests.

Darney, Reinke, Herman, Stormont, and Ialonga (2013) found in their longitudinal study in which they followed up 678 students between the 1st grade to 12th grade that the children who have academic and behavioral problems in the 1st grade receive mental health services more frequently in the following years, their academic success is low, and dropout rates are higher. Additionally, it is stated that the findings of the study did not differ according to the gender. No significant difference between female and male students could be found in this study. As a result of their study, Darney, Reinke, Herman, Stormont, and Ialonga (2013) stressed the importance of early intervention.

CONCLUSION AND SUGGESTIONS

The result of the study shows that the PSMS-T is a valid and reliable scale. This scale can be used by teachers to evaluate their students. Providing the chance for early intervention could be useful for students and their family.

Use of the scale in the 1st grade is suggested primarily to provide the chance for early intervention. Moreover, sharing the results of the study obtained from primary schools with the preschool teachers is suggested. In this way, it may contribute to increase in the quality of the preschool programs. In parallel with this, preschool teachers can prepare and apply individual education programs for their students.

It could be say that the scale is a reliable and valid evaluating tools for teacher use to determine adaptation problems and it could help to raise the quality and efficiency of education in the long term.

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