p-ISSN 2355-5343
e-ISSN 2502-4795
http://ejournal.upi.edu/index.php/mimbar

Article Received: 02/04/2022; Accepted: 22/12/2022
Mimbar Sekolah Dasar, Vol. 9(3), 517-534
DOI: 10.53400/mimbar-sd.v9i3.45144

# Development of a Perception Scale of Private Lesson: A Validity and Reliability Study

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**Abstract.** The purpose of the research is to develop a valid and reliable perception scale that can measure the perception of math teachers (198) and science teachers (120) towards private lesson. In the validity studies, the exploratory factor analysis was made with the SPSS 25.0 package program after that the confirmatory factor analysis was made with Lisrel 8.71 software. To develop the scale; 1. Creation of Item Pool 2. Obtaining Expert Opinion, 3. Creation of Pre-Trial Form 4. Factor Analysis 5. Confirmatory factor analysis. According to factor analysis; Kaiser Meyer Olkin (KMO) rate; .780; Bartlett test result: 7466.539; Cronbach alpha reliability coefficient is: .901. According to confirmatory factor analysis: Root Mean Square Error of Approximation (RMSEA) 0.043 (<.05); p-Value for Test of Close Fit .00 (<.05, Goodness of Fit Index (GFI) .96, Adjusted Goodness of Fit Index (AGFI) .93; Normed Fit Index (NFI) .97; Relative Fit Index (RFI) .96; Incremental Fix Index (IFI): .99; Degrees of Freedom: 38; Root Mean Square Residual (RMR): .037 and NonNormed Fit Index (NNFI): .98. According to research findings, the perception scale is valid and reliable so it can be used to determine math teachers and science teachers' positive and negative perceptions of private lesson.

**Keywords:** Private lesson, perception, perception scale, mathematics teachers, science teachers

## 1. Introduction

From past to present, supportive education practices have played an important role in increasing the academic success of students. Private lessons, which are described as a macro-phenomenon of modern education (Hamid, Sussex & Khan, 2009), are at the center of these practices today. Private lessons are the lessons that students take in school or out of school, in addition to the education they receive in formal school, in parallel with the school curriculum (Bray, Kwo & Jokić, 2016). Private lessons, which are also described by the term "shadow education", are defined as additional education services provided by individuals or private entrepreneurs with a profit motive to increase students' course grades or exam success (Türkdoğan & Koçak, 2020). Studies on the quality and application forms of this service, its place in the education systems of different countries, its advantages and disadvantages have gained momentum in recent years (Tan, 2017; Türkan & Çeliköz, 2018; Zhang & Bray, 2018).

### 1.1. Problem Statement

Private lessons are shaped in the shadow of the mainstream education system. Therefore, the quality of the education system directly affects the demand for private lessons and the quality of these practices (Bray & Lykins, 2012). It is known that factors such as: qualifications of teachers in public schools; crowded classrooms; insufficient lesson time; large differences in students' academic achievement; the pressure of high-risk centralized exams on students and families increase the demand for private lessons (Bray, 2007; Kobakhidze, 2016; Tansel & Bircan, 2004). Practices in different countries to meet the demand for private lessons are affected by a number of interrelated factors such as cultural structure, socio-economic status

and the place and visibility of private lessons in official education policies. For example, in countries where the Confucian tradition is dominant, the role of families in the education of children is great. For this reason, in Japan, South Korea, Taiwan, there is a high demand for one-to-one private lessons as a requirement of the cultural structure of the societies. At the same time, the fact that families feel obligated causes both themselves and non-governmental organizations to fund, develop and expand private lessons (Bray, 2006; Hamid, Sussex & Khan, 2009; Kim & Lee, 2010; Mori, 2015). As a natural consequence of this widespread use of private lessons, private lessons have become one of the main elements of the education system in these cultures. Thus, the visibility of private lessons has increased compared to America and Europe. The most important element that determines the quality of one to one private lesson practices is teachers, who are the main actors that drive these practices. As reflected in the studies, some of which have been summarized above, it can be said that the studies focusing specifically on the teacher factor of private lessons are not sufficient in terms of both number and scope. The studies conducted are mostly qualitative studies in local contexts, with a limited number of participants, based on interview data (Altınyelken, 2013; Bray & Kobakhidze, 2015; Khaydarov, 2020). In these studies, in which teachers' perceptions of private lessons are examined, it is seen that the general perception is positive. However, it is seen that teachers can have both positive and negative perceptions at the same time about private lessons for different reasons. For example, Bray and Kobakhidze (2015) found that teachers in their study found one-to-one or small group private lessons to be positive, but had a negative opinion about market-oriented course centers with large classrooms. Again, Khaydrov (2020) showed that despite many negative aspects of private lessons, teachers' views were positive and they found private lessons necessary for both learning and teaching. According to the teachers, private lessons functions as a survival mechanism that provides certain benefits as well as exacerbating existing problems in the education system. In another study, negative perceptions of school teachers towards students taking private lessons are mentioned. According to these teachers, students who take private lessons do not give enough importance to the lessons at school, so they both disrupt the harmony of the lesson and decrease their productivity (Kim, 2007).

### 1.2. Related Research

Studies and academic studies on private tutoring have gained a more feasible identity in earlier times. It can be said that studies on private lessons in cultures and countries other than Middle East countries are in their infancy. However, there has been a rapid increase in the number of studies on private lessons in America and Europe in recent years (Altınyelken, 2013; Guill & Bos, 2014; Ireson, 2004; Ireson & Rushforth, 2014; Sobhy, 2012; Tsiplakides, 2018). These studies, which focus on the advantages and disadvantages of private lessons, reveal different aspects of private lessons. Thus, the place of private lessons in education systems is understood and discussed, and it enables the development of new education policies. Again, these studies have revealed that private lesson is not a "private" phenomenon, but also intertwined with formal education in complex ways and related to it in many ways (Bray, Mazawi & Sultana, 2013). For example, Sobhy (2012) states that there are exams in the formal education system in Egypt for the transition between stages. Because of this system, students must take the exam many times. He states that because of this multi-layered transition, schools are almost out of function. He states that schools have been replaced by private tutoring centers and one-to-one private lessons. Again, in a study based on the results of interviews with a group of school administrators and teachers in Turkey, it was found that the demand for private lessons is increasing day by day. The most important reason for the demand for private lessons have found to be the discrepancy between the education given in schools and the questions asked in the central exams. In this case, it negatively affects student-centered, innovative educational practices (Altınyelken, 2013). In addition, the fact that private lessons bring a heavy financial burden for some families and cause inequality in education are among the other negatives of private lessons (Kirby, 2016; Tansel, 2013). On the other hand, it is thought that private lessons, which are planned individually or in small groups according to the needs of the students, offer more time for learning. In addition, it is stated that private lessons have a very positive effect on academic success and create a

productive context for teachers to improve themselves (Akdemir & Kılıç, 2020; Byun et al., 2018; Kuan, 2011). Hajar (2018), on the other hand, found that private lessons are effective in increasing students' self-esteem and interest in learning, in addition to benefits such as increasing the academic achievement of students and meeting the expectations of parents. In addition private lessons contribute to the socialization of students. All these research results, taken as a whole, are evaluated by the researchers that the positive and negative perceptions stated are a reflection of the complex nature of the private lesson phenomenon. However, they think that the phenomenon of private lessons, which is seen as a new academic field by the researchers, should be the subject of more academic researches, in a different and multifaceted way. Considering that private tutoring has the potential to change or transform even mainstream educational practices (Byun et al., 2018), this has become a necessity for today's education researchers.

### 1.3. Research Objectives

As a result, it is necessary to reveal the perceptions of teachers about private lesson. This scale will contribute to the enlightenment of a complex phenomenon such as private lessons in various aspects. It will contribute to the planning of future studies about private lessons. This scale can be applied to large sample groups. In the light of the data obtained, teachers with very positive and negative perceptions can be identified. And in-depth studies can be conducted with these teachers. At the same time, with the help of this scale, how teachers' perceptions change over time can be determined and compared. This perception scale will serve as a valid and reliable tool that will be needed to compare teachers' perceptions of lessons from different countries and cultures. In this context, the aim of this study is to develop a valid and reliable perception scale for determining teachers' perceptions of private lessons.

## 2. Theoretical Framework

When private lessons are considered from the legal point of view, it can be said that countries have adopted three different approaches. In some countries, teachers are encouraged to give private lessons and most private lessons are carried out by non-governmental organizations, while in some countries, private lessons are forbidden (Bray, 1999). A third case is to ignore the private tutoring thing. Many countries, including the United States, do not have an official tutoring policy (Southgate, 2009). Although it is legally prohibited in Turkey, private tutoring is commonly given (Koçak, 2022), but national research on this phenomenon is limited (Akdemir, 2018; Akdemir & Kılıç, 2020; Türkan, 2019; Yıldız, Türkdoğan & Koçak, 2022). It is seen that international literature is limited level too. It is seen that studies on private lessons mainly focus on the success and stratification that private lessons may create in society, ie inequality in education. Although the studies have reached different results, there is an intense opinion that private lessons are effective in increasing students' success (Southgate, 2009). However, it would not be right to consider private lessons within these two narrow patterns. Thus, it is clear that the literature on private lessons is not sufficient to deal with the parts other than these two dimensions.

However, it is stated that private tutoring is a phenomenon that is becoming more and more popular around the world (Dawson, 2010). In this sense, it is thought that conducting studies at the national level and associating them with the international literature will contribute to the international literature. In addition, when the researches are examined, it is seen that there are some negative effects on students, teachers and parents, who are the stakeholders of the course. Yıldız et al. (2022) investigated the negative effects of private lessons from the perspective of teachers and determined that private lessons had negative effects on teachers. The negative effects of private tutoring on teachers are: self-respect; sense of academic inadequacy; loss of motivation and interest; stress / anxiety; moving away from formal education; time problem; health problem. In addition, in another study, the effects of private lessons on teachers, students and parents were examined in a study conducted through the eyes of the teacher. The positive effects of private tutoring on teachers are as follows: It has been determined that they achieve financial gain, emotional satisfaction, professional development opportunity, the opportunity to respond to the demands of the

social environment, the expansion of the social environment and the development of the perspective on education (Koçak, 2022). In this sense, it is clear that there is a need for studies about privates lesson beyond the studies that only increase the success of students or deal with inequality of opportunity in education.

Considering both the different legal practices and the positive and negative effects of private lessons on teachers, there is a need for a scale that measures teachers' attitudes toward private lessons. It is thought that the developed measurement tool will enable more detailed studies to be done in the field.

## 3. Method

This study is a quantitative scale development study that will measure teachers' attitudes toward private lessons.

### 3.1. Research Design

The scale development study was carried out by the general screening model. The general screening model aims to reach a general judgment about a universe containing many elements. The whole population or the sample group representing it is scanned (Karasar, 2007).

### 3.2. Participant/Respondent

The developed draft scale was applied to mathematics and science teachers with private tutoring experience in this context. Demographic information about the sample is given in Table 1.

**Table 1.** Demographic Information about the Sample

| Variable | N | % | Variable | N | % |
|---|---|---|---|---|---|
| Gender | | | Professional experience | | |
| Male | 152 | 48 | 0-5 years | 122 | 38 |
| Female | 166 | 52 | 6-10 years | 68 | 21 |
| Branch | | | 11-15 years | 56 | 18 |
| Mathematics | 198 | 62 | 16 years and more | 72 | 23 |
| Science | 120 | 38 | Level of education | | |
| Age | | | Undergraduate | 250 | 79 |
| 21-30 | 149 | 47 | MSc | 52 | 16 |
| 31-40 | 106 | 33 | PhD | 16 | 5 |
| 41-50 | 51 | 16 | | | |
| 51 and more | 12 | 4 | | | |

When Table 1 is analysed, it is seen that 198 of the teachers participating in the research are mathematics teachers and 120 are science teachers.

### 3.3. The Development Process of the Scale

First of all, studies on private tutoring were analysed. In this analysis, the focus was on studies examining teachers' views or perceptions of private lessons. Researchers have previously conducted a study on the negative effects of private tutoring on stakeholders. Based on this study, a draft scale consisting of 39 items was prepared. While creating the draft scale, the opinions of academicians and teachers were also consulted.

An expert in the field of Turkish education examined the compliance of the items with the Turkish grammar rules. Three experts in the field of mathematics education with knowledge of

private tutoring examined the draft scale. The final version of the draft scale was created by taking into account the opinions of the experts. The draft scale was applied as a pilot application to 35 (16 mathematics and 19 science) teachers who give private lessons to test the construct validity. As a result of the pilot application, it was determined that there was no incomprehensible expression in the draft scale. There are 38 items in the draft scale before the actual application.

In perception scales, grading can be done in the form of a five-point rating (Dunn-Rankin, 2004; Tavşancıl, 2005). In this study, scale grading was done as in the following; "I absolutely disagree: 1", "I disagree: 2", "I am indecisive: 3", "I agree: 4" and "I absolutely agree: 5".

### 3.4. Data Collection Process

The data of the research were collected through the "Google forms" application. It was stated to the participants that "the data will be used for scientific research". It was emphasized that even the researchers could not know the identities of the participants, since the data were collected through "Google forms". The participants were asked to fill in the form, taking into account the negative situations they encountered while giving private lessons.

### 3.5. Data Analysis

To test the construct validity of the scale, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) was performed. Item-test correlations were calculated to examine item validity. Internal consistency reliability was calculated with Cronbach's Alpha. The t-test was performed to examine whether the items differentiated the upper and lower groups. The data of the research were analyzed in a computer environment with SPSS 25.0 and Lisrel 8 package programs. The answers to the negative items in the scale were scored in the opposite direction.

This research was carried out by taking the permission of Sivas Cumhuriyet University Ethics Committee into consideration.

## 4. Findings

Describe the findings comprehensively and build them into sub-findings or themes according to the research method and design.

### 4.1. Exploratory Factor Analysis of the PSNEPT (PSNEPT -EFA)

Exploratory factor analysis (EFA) was performed to test the construct validity of the draft scale. First, the Kaiser-Meyer-Olkin (KMO) and Bartlett tests were performed to measure the suitability of the data set for factor analysis. The results of these tests are given in Table 2.

**Table 2.** KMO and Bartlett test results of the PSNEPT

| | | |
|---|---|---|
| KMO | | .780 |
| Bartlett | $X^2$ | 7466.539 |
| | df | 666 |
| | p | .000 |

When Table 2 is analysed, it is seen that the KMO value is 0.78. This result is greater than 0.70, indicating that the data set is "well fit" for factor analysis (Brownlow, 2004; Pett, Lackey & Sullivan, 2003). In addition, when the Bartlett test results are analyzed, it is seen that the chi-square value is significant ($X^2$= 7466.539; df=666; p=0.00<.01). These results show that the data set is suitable for factor analysis.

Principal component analysis was chosen as the factorization method to determine the factor structure of PSNEPT. The maximum variability (varimax) technique, which is one of the

orthogonal rotation methods, has been chosen, taking into account the clarity and significance issues (Brownlow, 2004; Walkey & Welch, 2010).

When exploratory factor analysis is performed, it is recommended to omit items with a factor load value less than 0.40. In addition, the difference between the load values of an item in different factors should be at least 0.10 (Büyüköztürk, 2009). Items with less than 0.10 difference between the load values in the two factors are called overlapping items (Yavuz, 2005). As a result of the exploratory factor analysis, a total of 26 items were removed from the scale. There are 11 items left.

Eigenvalue test, percentage of the total variance, and scree plot were taken into account in determining the factor numbers of eleven items. Factors whose eigenvalue is 1 or bigger than 1 are accepted as important (Köklü, 2002). The results of the eigenvalue test are given in Table 3.

**Table 3.** Eigenvalue test results of the PSNEPT

| Factors | Eigenvalue | Explained variance (%) | Total variance explained (%) |
|---|---|---|---|
| First factor | 4.785 | 43.503 | 43.503 |
| Second factor | 2.373 | 21.574 | 65.078 |

When Table 3 is examined, according to the results of the exploratory factor analysis, there are two factors with an eigenvalue greater than 1. It is seen that the first factor contributed 43.503% and the second factor contributed 21.574% to the common variance. The contribution of these two factors to the total variance is 65.078%. This ratio is sufficient for multi-factor designs (Brownlow, 2004; Fabrigar & Wegener, 2011; Hutcheson & Sofroniou, 1999).

The scree plot regarding the factor structure of the scale is given in Figure 1. The factors up to the horizontal shape in the scree plot show the maximum number of factors that can be obtained (Thompson, 2004).

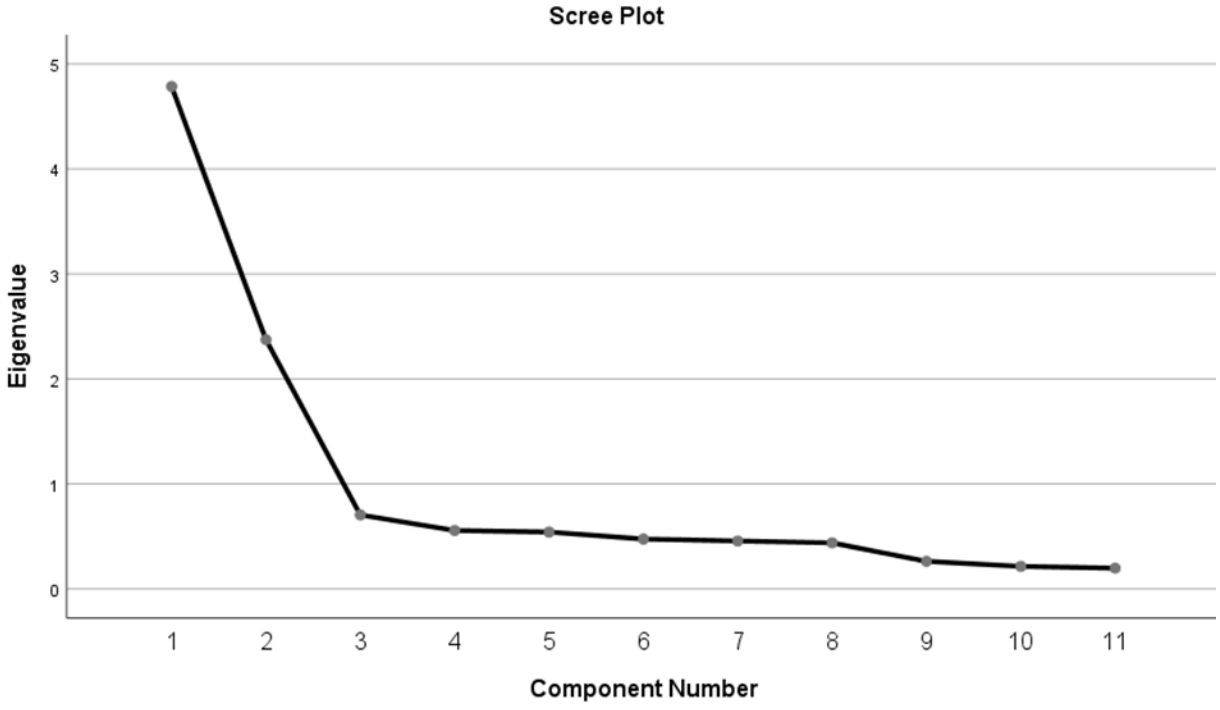

**Figure 1.** Scree Plot of PSNEPT

When the scree plot with the eigenvalues on the vertical axis and the factors on the horizontal axis is examined, it is seen that the high-accelerated decline decreases after the fourth point. The degree of contribution made to the downtrend variance seen from the first point is shown, and each interval between two points represents a factor (Çokluk et al., 2012). It was decided to conduct the analysis for two factors in line with the data obtained from the eigenvalue and variance percentages and the scree plot. The factor pattern obtained as a result of the analysis performed with two factors and the factor loads of the items are given in Table 3.

**Table 3.** Factor structure of PSNEPT

| | Factors | |
|---|---|---|
| Items | First factor | Second factor |
| 1 | .709 | |
| 3 | .810 | |
| 5 | .762 | |
| 13 | .687 | |
| 14 | .861 | |
| 15 | .853 | |
| 16 | .844 | |
| 18 | | .782 |
| 22 | | .780 |
| 23 | | .873 |
| 25 | | .824 |

When Table 3 is examined, there are 6 items (I1, I3, I5, I13, I14, I15 and I16) in the first factor, and the factor loads vary between .687 and .853. There are 4 items in the second factor (M18, M22, M23, and M25) and factor loadings vary between .780 and .824.

### *4.1.1. Item-Total Correlations*

The item-total correlation values explaining the validity coefficient of each item are presented in Table 4.

**Table 4.** Item-test correlation values of PSNEPT

| Items | First factor | Second factor | PSNEPT-Total |
|---|---|---|---|
| 1 | .609 | | .502 |
| 3 | .731 | | .632 |
| 5 | .677 | | .624 |
| 13 | .577 | | .428 |
| 14 | .791 | | .684 |
| 15 | .792 | | .716 |
| 16 | .781 | | .720 |
| 18 | | .623 | .406 |
| 22 | | .599 | .319 |
| 23 | | .761 | .558 |

| | | |
|---|---|---|
| 25 | .679 | .470 |

When Table 4 is examined, it is seen that the correlation coefficients of the items in the first factor with the first factor vary between 0.577 and 0.792. These values are moderate (0.30-0.70) for items 1, 5, and 13; It shows that items 3, 14, 15, and 16 have a high level (0.70 -1.00) of item-test correlation (Brownlow, 2004; Hutcheson & Sofroniou, 1999).

It is seen that the correlation coefficients of the second factor and the items in this factor vary between 0.599 and 0.761. These values show that items 18, 22, and 25 have a moderate (0.30-0.70) item-test correlation, while item 23 has a high level (0.70-1.00) item-test correlation (Brownlow, 2004; Hutcheson & Sofroniou, 1999).

It is seen that the correlation coefficients of the items with the whole scale vary between 0.319 and 0.720. These values show that items 15 and 16 have a high level (0.70-1.00) and the other items have a moderate (0.30-0.70) item-test correlation (Brownlow, 2004; Hutcheson & Sofroniou, 1999). The correlation scores between the sub-factors of the scale and the whole test are given in Table 5.

**Table 5.** Correlations between factor scores of the PSNEPT

| | First factor | Second factor | PSNEPT-Total |
|---|---|---|---|
| First factor | 1 | 0.253** | 0.882** |
| Second factor | 0.253** | 1 | 0.679** |
| PSNEPT-Total | 0.882** | 0.679** | 1 |

**p<.01

When Table 5 is examined, there is a weak correlation (r=.253; p<.000) between the 1st factor and the 2nd factor. It is seen that the whole scale has a positive and significant relationship with the 1st factor (r=.882; p<.000) and the 2nd factor (r=.679; p<.000).

### *4.1.2. Discriminations of Items*

The t-test was used to determine the discrimination power of the items in the scale. For this purpose, the total scores obtained from the scale were ordered from largest to smallest. Then groups below 27% and above 27% were determined. Independent groups' t-test values are calculated over the scores of both groups and shown in Table 6.

**Table 6**. The item analysis results of PSNEPT

| Items | Groups | N | X | Ss | t | P |
|---|---|---|---|---|---|---|
| 1 | Above | 85 | 1.2941 | .45835 | -8.978 | .000 |
| | Below | 85 | 2.2791 | .90295 | | |
| 3 | Above | 85 | 1.4118 | .49507 | -13.059 | .000 |
| | Below | 85 | 2.8605 | .89657 | | |
| 5 | Above | 85 | 1.4235 | .52045 | -12.969 | .000 |
| | Below | 85 | 3.0000 | .99410 | | |
| 13 | Above | 85 | 1.4588 | .50126 | -8.51 | .000 |
| | Below | 85 | 2.3721 | .85470 | | |
| 14 | Above | 85 | 1.4706 | .52527 | -11.349 | .000 |
| | Below | 85 | 2.9186 | 1.05401 | | |
| 15 | Above | 85 | 1.3765 | .48738 | -13.738 | .000 |
| | Below | 85 | 2.8488 | .86115 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16 | Above | 85 | 1.4000 | .49281 | -12.902 | .000 |
| | Below | 85 | 3.0233 | 1.05135 | | |
| 18 | Above | 85 | 2.6235 | .91256 | -9.75 | .000 |
| | Below | 85 | 3.8605 | .73825 | | |
| 22 | Above | 85 | 3.0824 | .81958 | -7.91 | .000 |
| | Below | 85 | 3.9767 | .65037 | | |
| 23 | Above | 85 | 2.4118 | .62286 | -14.795 | .000 |
| | Below | 85 | 3.8953 | .68649 | | |
| 25 | Above | 85 | 2.1765 | .69310 | -11.768 | .000 |
| | Below | 85 | 3.6860 | .96115 | | |

Table 6 shows that there is a significant difference between the above and below groups (p<.01). This significant differentiation is an indication that the items in the scale have the desired level of distinctiveness (Brownlow, 2004).

### 4.2. Confirmatory Factor Analysis of PSNEPT (PSNEPT -CFA)

Confirmatory factor analysis (CFA) was performed to evaluate the validity of the two-factor structure of the PSNEPT that emerged as a result of the exploratory factor analysis. The findings obtained as a result of confirmatory factor analysis are given in Table 7 and Figure 2.

**Table 7.** CFA of PSNEPT

| Indexes | Values |
|---|---|
| $x^2$ | 72.84 |
| Degrees of Freedom (Df) | 38 |
| $x^2$/sd | 1.92 |
| p- Value | 0.000 |
| RMSEA (Root Mean Square Error of Approximation) | 0.043 |
| NFI (Normed Fit Index) | 0.97 |
| NNFI (Non-Normed Fit Index) | 0.98 |
| RMR (Root Mean Square Residual) | 0.037 |
| SRMR (Standardized Root Mean Square Residual) | 0.048 |
| GFI (Goodness of Fit Index) | 0.96 |
| AGFI (Adjusted Goodness of Fit Index) | 0.93 |
| RFI (Relative Fit Index) | 0.96 |
| IFI (Incremental Fit Index) | 0.99 |

A ratio of $X^2$ to degrees of freedom of 1.92 and a ratio less than 3 indicates an acceptable fit (Corral & Calvete 2000). GFI, AGFI, NFI and NNFI values higher than 0.90 indicate a perfect fit. RMSEA=0.043 and this value being 0.05-0.08 indicates an acceptable fit (Hoe, 2008). SRMR=0.048 and this value being 0.05-0.1 indicates a good fit (Corral & Calvete 2000). In addition, other compliance values are also within the acceptance limits (Bartholomew, Knott & Moustaki, 2011; Brown, 2006; Thompson, 2004).

The path diagram obtained as a result of confirmatory factor analysis is given in Figure 2.

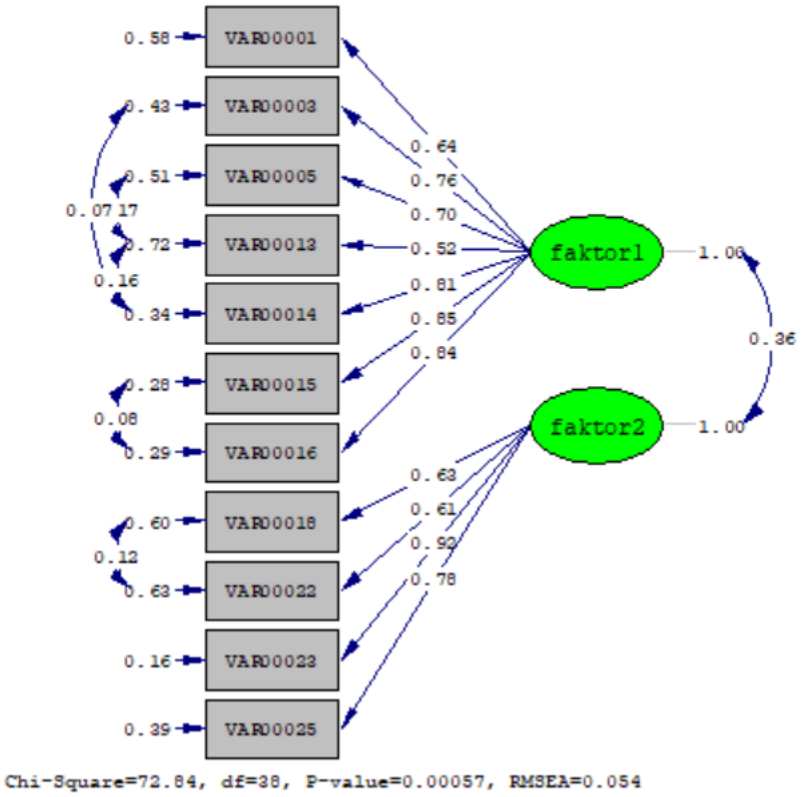


**Figure 2.** Confirmatory factor analysis (Path Diagram) of PSNEPT

When the diagram is examined, the factor loading value of each item is above 0.40. In other words, each of the items is compatible with the factors. As a result of the confirmatory factor analysis, the items of the scale are verified.

#### *4.2.1. Internal Consistency of PSNEPT*

The Cronbach Alpha reliability coefficient, which is one of the internal consistency methods, was calculated to determine the reliability of the LOSS. The Cronbach Alpha reliability coefficients for the whole scale and its sub-factors are given in Table 8.

**Table 7.** Internal Consistency of PSNEPT

| Factors | Cronbach Alfa |
|---|---|
| First factor | .833 |
| Second factor | .901 |
| PSNEPT-Total | .858 |

When Table 7 is examined, the Cronbach's alpha reliability coefficients in the PSNEPT, which consists of a two-factor structure, were calculated as .833 for the 1st factor, .901 for the 2nd factor, and .858 for the whole scale. The fact that these results are greater than 0.80 is proof that the whole scale and its sub-dimensions are reliable (Brownlow, 2004).

## 5. Discussion

This study was carried out to develop a valid and reliable perception scale that can measure the perceptions of teachers' perceptions of private tutoring. This is the first study to measure the teachers' attitudes toward the private lesson. During the preparation of the scale, a literature review was conducted and other studies on private tutoring were examined. After,

an item pool was created in line with the relevant literature, expert opinion on the items was obtained, and a pilot implementation phase was carried out on the item pool. All these steps are necessary to develop a psychometrically robust scale that meets content validity and reliability (DeVellis, 2003; McCoach, Gable & Madura, 2013).

Before the exploratory factor analysis, the Kaiser-Meyer-Olkin (KMO) test was applied to determine the suitability of the sample size for factorization and the KMO value was determined to be 0.78. These values show that the variables are highly correlated with each other (Field, 2005). In addition, it was determined that the chi-square value of the Bartlett Sphericity test result was significant ($X2=7466.539$; $p<.01$). The test statistic being significant indicates that the data come from a multivariate normal distribution (Frankel & Wallen 2006). In other words, these values are suitable for factor analysis of the data (Şencan, 2005).

In the exploratory factor analysis, the lower cut-off point for the factor loading value was determined as 0.40. In addition, these items were also considered as overlapping items because they gave high loads to more than one factor and the difference between these factor loading values was less than 0.10. Items that do not meet the relevant criteria should be removed from the scale (Frankel & Wallen 2006). As a result of the exploratory factor analysis, a total of 26 items were removed from the scale.

As a result of the exploratory factor analysis, which was re-applied to the remaining 11 items after the eliminated items were removed, it was concluded that the scale consisted of 2 factors with an eigenvalue greater than 1. According to the CFA result for the validity of the 11-item two-factor structure of the LOSS, the ratio of X2 to the degrees of freedom is slightly above 2 and is at an acceptable level (Byrne, 2010).

It is understood that the model has an acceptable fit due to RMSEA of 0.043, a good fit due to SRMR of 0.048, and an excellent fit due to NFI of 0.97 and NNFI of 0.98. These results show that the scale is compatible with the actual data (Brown, 2006; Raykov & Marcoulides, 2006; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

When Table 7 is examined, it is seen that the two-factor structure of the perception scale is a usable and valid model, since it is understood that all fit values are within the limits of acceptance.

Cronbach Alpha, reliability coefficient for the whole scale; It was calculated as 0.858. Cronbach's Alpha reliability coefficient of the first dimension in the subscales of the perception scale; The Cronbach Alpha reliability coefficient of the second dimension of 0.833 was calculated as 0.901. The Cronbach Alpha reliability coefficient for the whole scale and the subscales, and the correlation coefficients between the subscales indicate that the scale is reliable (Kline, 2011).

Türkan and Çeliköz (2016) stated that the fact that the transitions between education levels are based on exams causes students to turn to private lessons. In their study, the researchers developed a valid and reliable scale to determine the "Special Lesson Tendency" of secondary school students. The sample is 704 students from 7 high schools. The scale consists of 33 items gathered under 4 factors. The scale consists of 33 items gathered under 4 factors. Alpha reliability coefficient of the scale was found to be 0.84, and the Kaiser-Meyer Olkin (KMO) value of 0.87.

Adcock & Van Eck (2005) developed a tool to measure teachers' perceptions of the pedagogical agents they use to teach. The study is based on the fact that individualized instruction and one-to-one instruction contribute to students' in-depth understanding of the subjects. It is stated that computer-assisted instruction creates like an individualized and one-to-one learning environment similar to private lessons. Within the scope of the study, the Instructor Representative Scale (ATTAS) had developed. The scale aims to measure attitudes toward understanding by targeting private lessons. The scale items were administered to 129 participants from 3 universities interacting with "AutoTutor", an animated pedagogical agent designed to teach conceptual physics. The results of the factor analysis yielded a scale with three structures; (i) speech/pedagogy, (ii) student attitude, and (iii) student interest/attention.

Confidence analyses yielded strong reliability coefficients for each construct (alphas of .84, .87, and .89, respectively).

Yalçınkaya, Eldemir and Sönmezöz (2013) carried out a study in order to develop an attitude scale to be used to measure attitudes towards the "Individual Instrument" course. The scale was applied to 373 students who received professional music education at various universities. In addition, the Cronbach Alpha reliability coefficient of the scale was found to be 0.947, and the Kaiser-Meyer Olkin (KMO) value of 0.96.

## 6. Conclusion

Private lessons are becoming more and more common in many countries. Current research focuses on the advantages and disadvantages of private tutoring for students. Teachers' views on private lessons have not been adequately studied. As a result, it is necessary to develop a scale that can be used to reveal teachers' perceptions of private lessons. It is predicted that the scale, which is valid and reliable, will be a helpful resource in determining and interpreting teachers' perceptions of private lessons. In addition, such a scale will contribute to illuminating various aspects of a complex phenomenon such as private tutoring.

## Limitation

This study was carried out with the aim of developing a valid and reliable attitude scale towards private lessons. However, the sample consists of only teachers from Turkey. This is a limitation of this study. In order for the scale to be used in an international area, it may be necessary to re-examine its reliability by applying it to teachers from different countries.

## Recommendations

According to results, it has been seen that the perception scale can be used in experimental and descriptive studies to determine the perceptions of mathematics teachers or science teachers about private lessons. By using a scale, the attitudes of science and mathematics teachers towards private lessons should be compared. If there are differences in attitudes towards private lessons depending on the branches, the reasons can be investigated. The differentiation in the attitudes of teacher candidates towards private lessons can be investigated latitudinal and longitudinal. The change in teachers' attitudes towards private lessons can be examined in the light of various demographic characteristics.

## Acknowledgements

This study is not supported by a foundation.

## Conflict of Interest

The Authors declare that there is no conflict of interest.

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## Appendix 1. Perception Scale of Private Lesson

| No | | Number of item | Perceptions | I absolutely disagree | I disagree | I am indecisive | I agree | I absolutely |
|---|---|---|---|---|---|---|---|---|
| 1 | Factor 1 | 1 | The teacher neglects her students at school because she gives private lessons. | | | | | |
| 2 | | 3 | Giving private lessons damages the dignity of the teacher. | | | | | |
| 3 | | 5 | When the teacher gives private lessons, it causes inequality of opportunity for the students. | | | | | |
| 4 | | 13 | Giving private lessons causes a low motivation in the teacher's lessons at school. | | | | | |
| 5 | | 14 | Giving private lessons causes a low motivation in the teacher's private lessons. | | | | | |
| 6 | | 15 | The tolerance of the teacher who gives private lessons to the students in the school lessons decreases. . | | | | | |
| 7 | | 16 | The tolerance of the teacher who gives private lessons to the student in private lessons decreases. | | | | | |
| 8 | Factor 2 | 18 | The high success expectation of the parents in private lessons creates stress for the teacher. | | | | | |
| 9 | | 22 | The efficiency of the teacher who gives private lessons at school decreases. | | | | | |
| 10 | | 23 | The efficiency of the teacher giving private lessons decreases in private lessons. | | | | | |
| 11 | | 25 | The teacher giving private lessons is to be alienated from her lessons at school. | | | | | |

* Items 2, 4 and 6 are perception sentences with negative meaning.

** Items with negative meaning should be analyzed by reversing (re-coding).

## Appendix 2. Perception Scale of Private Lesson (in Original Language)

| | Özel Derse Yönelik Algı Ölçeği | Tamamen Katılıyorum | Katılıyorum | Kismen Katılıyorum | Katılmıyorum | Tamamen Katılmıyorum |
|---|---|---|---|---|---|---|
| 1 | Öğretmen, özel ders verdiği için okuldaki öğrencilerini ihmal etmektedir. | | | | | |
| 2 | Özel ders vermek öğretmenin saygınlığını zedelemektedir. | | | | | |
| 3 | Öğretmen özel ders verdiğinde öğrenciler için fırsat eşitsizliğine neden olmaktadır. | | | | | |
| 4 | Özel ders vermek öğretmenin okuldaki derslerinde motivasyon düşüklüğüne neden olmaktadır. | | | | | |
| 5 | Özel ders vermek öğretmenin özel derslerinde motivasyon düşüklüğüne neden olmaktadır. | | | | | |
| 6 | Özel ders veren öğretmenin okuldaki derslerde öğrenciye tahammülü azalmaktadır. | | | | | |
| 7 | Özel ders veren öğretmenin özel derslerde öğrenciye tahammülü azalmaktadır. | | | | | |
| 8 | Özel derste velinin yüksek başarı beklentisi öğretmende stres oluşturmaktadır. | | | | | |
| 9 | Özel ders veren öğretmenin okuldaki verimi düşmektedir. | | | | | |
| 10 | Özel ders veren öğretmenin özel dersteki verimi düşmektedir. | | | | | |
| 11 | Özel ders veren öğretmen okuldaki derslerinden soğumaktadır. | | | | | |