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## **Validity and Reliability Study: Values Scale for Secondary School Students (VSS)**

DIDEM CETIN and MUSTAFA VOLKAN COSKUN

### **Abstract**

The purpose of the current study is to develop a data collection tool that can be used to determine the values of secondary school students. The study group consists of 299 students attending secondary schools in the city of Mugla, Turkey, who voluntarily participated in the study. For the construct validity of the scale, exploratory and confirmatory factor analyses were conducted. As a result of the exploratory factor analysis (EFA), a three-factor structure was elicited for the factors of “Sensitivity”, “Trustability”, and “Responsibility”. This three-factor structure together explains 41.11% of the total variance. The scale comprises of 30 items that can be assigned scores ranging from “1 (Never)” to “4 (Always)”. When the findings obtained through confirmatory factor analysis (CFA) were evaluated,  $\chi^2/df$  ratio was found to be 2.93. The 30-item, three-factor structure obtained as a result of EFA was also examined using CFA and the results showed that the scale yields good fit values. For the trustability of the scale, item-total correlation and Cronbach’s Alpha internal consistency coefficient were analyzed. In conclusion, a valid and reliable scale with adequate psychometric features was developed in order to determine the values of secondary school students (VSS).

**Keywords:** values scale, validity and reliability study, secondary school students.



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## Introduction

The concept of “value inculcation”, a recently important subject of social sciences which is believed to enhance the content of education, has been called different names such as “moral education”, “values education” and “character training” throughout its developmental process. According to Schwartz (1992), values serve the function of a guide for the principles of a person or any social entities during their lives. Values are also defined as criteria through which principles, beliefs and actions providing guidance for behaviors and giving meanings and importance to culture and society are judged as good or desirable (Arce, 2001; Gungor, 1998; Rokeach, 1973; Yilmaz, 2008). According to Hofstede (1991), in general, values are individuals’ tendencies to opt for certain states in their relationships with others. Values are desired targets directing individuals’ lives, serving as norms and having differing degrees of importance (Schwartz & Sagie, 2000). Here, however, desirable or preferable is used to mean the things that we do not only want for ourselves, but also for others (Donmezer, 1994; Silah, 2000).

Tendency to evaluate others, events, situations, self and things is not only an inherent characteristic of humans, but also a requirement for survival (Kucuradi, 2013). In this regard, values are a unity of beliefs and judgments reflecting the importance attached to any entity or incidence by people, having a power of giving direction to behaviors and having psychological, social, ethical and aesthetic dimensions (Yesil & Aydin, 2007). These various disciplines’ dealing with the subject of values might differ relatively. Pethia (1970) argues that values represent a concept used to define implicit or stated opinions about what is good and desirable or what is bad and undesirable. Values help individuals define what they think is good. However, the question of “what is good?” is one of the subjects having been discussed in the field of philosophy for centuries. One of the disciplines of philosophy, axiology studies the general nature of “value” and seeks answers to questions such as “Are there values; if they are, what kinds of entities do they have, are values subjective or objective?”. According to Plato, “good” is the idea of the ideas. For something to be good, it must be prudent and balanced, self-sufficient and be the last purpose concerning the goodness (Kucuradi, 2013). According to Aristotle, good is synonymous with happiness. Aristotle believes that happiness coming from self-actualization should be the target to be pursued by all people more than anything (Cevizci, 2010). In other words, for people to be virtuous, they should be helped to know correctly, to think accurately, to make correct evaluations and to see that they are acting properly.

In its sociological meaning, value is generally defined as something useful and desirable for the individual and the group (Aydin, 2003). Approaches putting emphasis on the subjectivity of values and considering them as the preference of an individual are usually regarded to be psychological approaches. For example, according to the classification of Kohlberg, in any case, value preferences of an individual having a pre-traditional moral sentiment will naturally be different from the value preferences of an individual having a traditional or post-traditional moral sentiment. As in the current study, values are considered within a sociological perspective, so no further detail will be given about discussions in the field of value philosophy.

Educational status and social, cultural, artistic and ethical characteristics of a society are fundamental elements determining its development level. In the formation of these elements, attitudes and behaviors of the individuals living in this society and their values

play an important role. Values are the building blocks regulating interpersonal and social relationships, and contribute to the development of a society. Values emerge as criteria to evaluate individuals' thoughts, attitudes, behaviors and works and form an indispensable part of social unity (Erdem, 2003; Yilmaz, 2008). In the life of a society, everything is perceived and compared with others on the basis of values. Individuals usually capitalize on social and cultural values they have adopted as criteria in their judgments and preferences. In this way, they can reach such general judgments as this is better, more accurate, more suitable, more beautiful, more important, and more just (Dilmac, Bozgeyikli, & Cıkılı, 2008).

Survival of societies depends on protecting their values and handing them down to future generations. Values help individuals to evaluate their behaviors and relationships and accordingly, they are one of the determiners of the behaviors to be adopted by individuals. In the broadest terms, values serve the following functions (Fitcher, 2009 cited in Guven, 2015):

- Values help an individual to determine its social position in the eye of other people.
- Values direct people towards useful and important elements of material culture.
- They show the scheme of socially acceptable behaviors to the individual. Thus, individuals can understand how they can best display their behaviors and opinions.
- They provide guidance and encouragement for individuals to select their social roles and to perform these roles.
- Values assume the role of a tool contributing to the solidarity of a society.

It is true that the future of a society is, to a great extent, determined by well-educated people with well-established characters and people do not naturally develop a good and ethical character on their own. In this regard, it is one of the primary duties of schools to impart values and skills that can help students to make ethical decisions and to exhibit ethical behaviors (Eksi, 2003).

The basic means of transfer that makes values sustainable and creates new values is education. Throughout the history of education, one of the most important duties assigned to it has always been the transfer of values to future generations. The value transfer function of education can be argued to serve the aim of handing down the social values that help to protect and sustain the existing social structure for future generations. This relationship between education and value is not a new one and has a long history. In fact, Aristotle says that he cannot present a rational explanation of why a behavior of an individual is wrong or indeed correct. In this regard, an individual should first learn how to behave properly. Only then can the behavior of this individual be evaluated on a rational basis (Cevizci, 2010).

There are many elements such as family, teacher, course content, school environment and mass communication that are influential in values education. Without doubt, among these elements the most important role should be assumed by the family and by the teacher. According to Ozkaya and Coskun (2015), in the transfer and maintenance of values, families and teachers have a very effective role to play. The values imparted to children by their families are reinforced by teachers and new values are built on these reinforced values. In this way, qualified individuals who are at peace with themselves and their society can be trained. In a society comprised of such individuals, peace and order prevail. Considering the

value transfer role of teachers, the values held by teachers and how they reflect these values on their lives are of great importance.

Particularly in recent years, the subject of values education has been implicitly incorporated into education programs in Turkey. For this education to be successful, teachers as well as education programs should take on important responsibilities. Teachers should be positive role models for their students during the process of values education and support their students throughout the process. When teachers become good role models, accurately reflecting values both inside and outside the school, establishing ethical classroom environments, use different strategies in their class and conduct various activities inside and outside the class to impart values to their students, values education will more likely be able to accomplish its objectives. On the other hand, one important point to be emphasized is that conducting values education only at schools might not be enough. When values education does not involve the family or is conducted by excluding the family, then it can never be considered as complete. In such cases, students might experience dilemmas between the values promoted at school and imposed by the family. Therefore, for an effective values education to take place, efficient communication and coordination should be established between families and the school and the process should be conducted with the participation of the family (Güven, 2015).

With the adoption of constructivist approach in Turkey, in addition to the cognitive training of students, affective training including students' interests, attitudes, values and beliefs was integrated into the Education Program in 2005. Thus, one of the objectives of all courses offered within the education programs of Turkish National Education was to impart values to students and to help them to internalize these values and then turn them into behaviors. However, problems such as teachers' not being sufficiently qualified and not having enough information about values education might pose a threat to the effectiveness of values education. For instance, in a study conducted by Kurtulmus, Tosten, and Gundas (2014) to investigate the problems experienced by elementary school teachers during the process of values education, it was found that the teachers view themselves as one of the problems. Moreover, the participating teachers stated that other teachers' negative behaviors and not being good role models for students, their lack of information about values education, their not believing in the effectiveness of values education given at schools and their regarding values education as unimportant are other problems encountered during this process. In some other studies, it was also found that not much importance is attached to values education at schools, pre-service teachers do not have theoretical knowledge about values education and they have different views and perceptions of values (Ates, 2013; Cengelci, 2010; Ogretici, 2011; Yazar, 2012). In this respect, the current study was intended to develop a measurement tool that can be used to determine the values held by school students aged 10-14 years old.

## **Methodology**

In the selection of students to be included in the study group, attention has been paid to choose participants from schools in areas of various socio-economic levels. In this regard, 496 students from various secondary schools located in the city of Mugla were reached. However, 41 of the returned scales were discarded as they were improperly completed, and 56 others were discarded due to inconsistencies exposed through responses given to the

control questions. In total, 97 of the scales were excluded, and the analyses were conducted on 399 properly completed scales.

Of the participants, 55.9% are female (n=223) and 44.1% are male (n=176). Grade levels of the students are as follows: 25.1% are fifth graders (n=99), 29.6% sixth graders (n=118), 29.6% seventh graders (n=86), and 24.1% are eighth graders (n=96). When the educational levels of the students' mothers are examined, it is seen that 13.2% of their mothers (n=52) are elementary school graduates, 19.6% (n=77) secondary school graduates, 36.9% (n=145) high school graduates, and 30.3% (n=118) are university graduates. When the educational levels of their fathers are examined, it is seen that 10.7% of their fathers (n=41) are elementary school graduates, 14.9% (n=57) secondary school graduates, 35.1% (n=134) high school graduates, and 39.3% (n=150) are university graduates.

In the process of developing the items of the Values Scale for Secondary School Students (VSS), first, value statements elicited by the researchers in their previous study through face-to-face interviews were taken as the basis. In addition to these, a literature review was performed and measurements tools constructed to evaluate values in the literature (Caliskan & Saglam, 2012; Coskun Keskin, 2012; Schwartz & Boehnke, 2004) were analyzed. In this way, a total of 95 items were developed to be included in the draft form of the scale. By considering the ages and developmental characteristics of the students, it was decided that a four-point, Likert-type scale would be suitable for the purpose of the current study. Answer alternatives in the scale were set to be "1-never", "2-sometimes", "3-often", and "4-always".

The items gathered in the item pool were submitted to the scrutiny of 11 field experts in order to evaluate their meaning, content, comprehensibility and clarity. Two of these experts work in the field of educational administration, four in the field of psychological counseling and guidance, one in the field of classroom teacher education, and four of them work in the field of Turkish language teaching. In line with the experts' feedback, some items were divided, some were discarded from the scale, and some corrections were applied. Then the scale was administered to a group of ten students in order to test characteristics such as its comprehensibility, response easiness and time required to complete the scale. After the students completed their scales, they were asked what they thought about the comprehensibility of the items and the scale. In light of the students' opinions, the final form of the scale was agreed and the 99-item scale became ready to administer.

In order to test the construct validity of the Values Scale for Secondary School Students (VSS), first, Exploratory Factor Analysis (EFA) was applied and then Confirmatory Factor Analysis (CFA) was conducted in order to determine whether or not the structure obtained as a result of EFA was suitable. For the reliability of the scale, item-total correlation and Cronbach's Alpha internal consistency coefficient were analyzed.

## Findings

In this section, findings related to validity and reliability studies of the Values Scale for Secondary School Students (VSS) are presented. During the development process of the scale, exploratory and confirmatory factor analyses were run to examine the construct validity and then reliability analysis of the factors and determination of factor relationships were undertaken.

### *Findings related to Exploratory Factor Analysis*

Prior to the factor analysis, in order to determine whether or not the dataset is suitable for factor analysis, Kaiser Meyer Olkin (KMO) coefficient was calculated and Bartlett's Test of Sphericity was conducted. In the current study, KMO value was calculated to be .84. The result of Bartlett's Test of Sphericity was found to be significant [ $\chi^2=13007.29$ ;  $df=4656$ ;  $p<.00$ ]. These results show that the data came from a multi-variable normal distribution and suitable for EFA (Leech, Barrett, & Morgan, 2005; Tavşancıl, 2005).

EFA was conducted in order to determine the factor structure of VSS. Because of the assumption that the factors of the scale would be independent of each other, Varimax vertical rotation was used in the analysis. Deciding whether or not an item is suitable for a factor, predication on that factor loading should be at least .30 and the difference between the factors loadings should be .10 or above (Tabachnick & Fidel, 2001). The items that do not satisfy this condition were discarded from the scale. As a result of the first factor analysis, it was found that the scale items are subsumed under 15 factors with eigenvalues higher than 1. This 15-factor structure explains 63.67% of the total variance. The structure obtained as a result of the analysis was examined and it was decided to reform the structure as a three-factor structure and then the data analyzed again. While making this decision, the number of items collected under each factor, the contribution of the factors to variance, examined scree plot graph and comprehensibility of the emerging factors were taken into consideration (Ozdamar, 2004). In this connection, the scale was decided upon as a three-factor scale and the analysis of the data conducted again. As a result of the factor analysis, factor loading values and overlapping items were examined and then the items that did not meet the criterion were excluded one by one and then the operation was repeated again. In the item exclusion operation, first overlapping items were discarded and then they were followed by the items with lower factor loading values (Cokluk, Sekercioglu, & Buyukozturk, 2010). As a result of these operations, a total of 45 items were discarded from the scale and the scale was reduced to 44 items. With these 44 items, EFA was repeated. The emerging three factors were named as "sensitivity, trustability and responsibility". Moreover, seven items under the sensitivity factor and seven items under the trustability factor were discarded from the scale one by one by the researchers as they did not comply with the other items in the scale although they had high factor loadings and the analysis was repeated each time. As a result, the scale was reduced to 30 items and then EFA was conducted on this 30-item scale again. For this 30-item scale, KMO value was calculated to be .84 and Barlett's Test of Sphericity result was found be significant [ $\chi^2=4425.13$ ;  $df=435$ ;  $p<.00$ ]. EFA results after Varimax vertical rotation are presented in Table 1.

**Table 1.** Exploratory Factor Analysis Results

Item	Factor 1 Sensitivity	Factor 2 Trustability	Factor 3 Responsibility	Common Factor Variance	Item-Total Correlation	Cronbach's Alpha	Explained Variance (%)
I1	.65	.14	.04	.45	.56	.87	17.75
I2	.57	.13	.08	.34	.51		
I3	.57	.03	.22	.37	.51		
I4	.68	.14	.04	.48	.59		
I5	.67	.14	.01	.47	.59		
I9	.48	.30	.04	.33	.44		
I12	.69	.13	.10	.51	.59		
I13	.54	.10	.13	.32	.46		

Item	Factor 1 Sensitivity	Factor 2 Trustability	Factor 3 Responsibility	Common Factor Variance	Item-Total Correlation	Cronbach's Alpha	Explained Variance (%)
I14	.49	.23	.11	.31	.47		
I18	.53	.01	.14	.30	.46		
I20	.60	.32	.04	.47	.56		
I24	.66	.07	.13	.45	.57		
I26	.50	.15	.33	.38	.48		
I27	.65	.04	.06	.43	.43		
I6	.23	.50	.21	.35	.47	.84	15.91
I7	.07	.59	.07	.36	.53		
I8	.10	.63	.06	.41	.56		
I10	.01	.63	.20	.44	.48		
I11	.13	.67	.17	.50	.53		
I15	.20	.65	.05	.46	.59		
I16	.06	.59	.24	.41	.52		
I17	.13	.69	.01	.48	.60		
I21	.11	.62	.12	.41	.54		
I25	.10	.50	.36	.39	.46		
I28	.03	.63	.07	.40	.52		
I19	.04	.23	.60	.41	.32	.71	7.75
I22	.04	.30	.54	.38	.39		
I23	.24	.02	.78	.66	.64		
I29	.34	.12	.49	.37	.35		
I30	.01	.33	.51	.37	.32		

As can be seen in Table 1, there are 14 items gathered under the first factor of VSS (sensitivity), and their factor loading values rotated through Varimax vertical rotation method vary between 0.48 and 0.69. This factor explains on its own 17.75% of the total variance. The second factor of the scale is “trustability”, which includes 11 items. The factor loading values of the items vary between 0.50 and 0.69. The variance explained by this factor on its own is 15.91%. There are five items under the third factor of the scale, “responsibility”, with factor loading values of the items varying between 0.49 and 0.60. The variance explained by this factor on its own is 7.75%. All of the factors together explain 41.41% of the total variance.

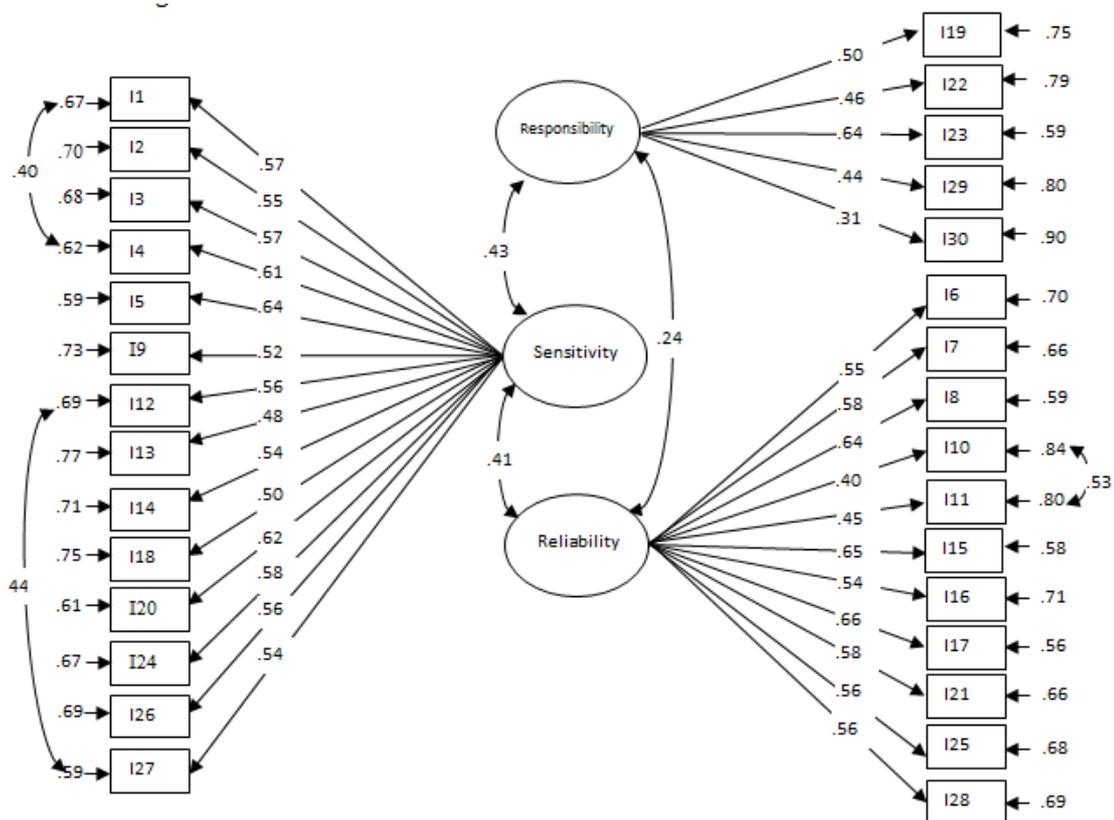
The following are example items from the factors of VSS: *Factor 1 – Sensitivity*: I1: I give up my place to elderly people anywhere; I18: I share my valuable possessions with my friends. *Factor 2 – Trustability*: I10: If I like something entrusted to me, I use it; I16: I tell a lie to get out of a difficult situation. *Factor 3 – Responsibility*: I22: I prefer spending time with my friends to doing my assignments; I23: I give up watching a film I like very much to finish my assignments.

#### *Findings related to Confirmatory Factor Analysis (CFA)*

In order to collect additional evidence for the validity of the three-factor structure of VSS determined with EFA, CFA was conducted on the 30-item scale. For this purpose, primary level CFA was conducted and during this process, covariance matrix and maximum likelihood method were utilized.

While conducting CFA, two modifications in the sensitivity factor (I1 and I4, I12 and I27) and one modification in the trustability factor (I10 and I11) were made and thus error

variances were related. When the data obtained through CFA were analyzed,  $\chi^2/df$  ratio was found to be 2.93 ( $\chi^2/df=1172.66/399$ ). In the literature, it is stated that when this ratio is  $\leq 3$ , it shows a “good fit” (Kline, 2005). The other goodness of fit values calculated with CFA are as follows: RMSEA= .07, NFI= .88, NNFI= .91, CFI= .92, IFI= 0.92, RMR= 0.07, SRMR= 0.08, and PGFI= 0.72. All of these goodness of fit values show that measurement model of VSS is an acceptable model (Hu & Bentler, 1999; Joreskog & Sorbom, 1993; Kline, 2005; Schermelleh-Engel, Moosbrugger, & Muller, 2003). The structure obtained as a result of CFA is shown in Figure 1.



**Figure 1.** VSS Scale Standardized Path Coefficients

Standardized path coefficients ( $\lambda_i$ ), as shown in the path diagram presented in Figure 1, give the correlations between each observed variable and its related latent variable. This value is ranging from .48 to .64 for the sensitivity factor, from .56 to .84 for the trustability factor, and from .59 to .90 for the responsibility factor. The variance ratios explained by the items in the factors vary between .23 and .41 for the sensitivity factor, between .31 and .71 for the trustability factor, and between .35 and .81 for the responsibility factor. The  $t$  values for all of the items are significant at the level of .01.

*Findings Related to Reliability of the Scale*

For the reliability of the scale, item-total correlations and Cronbach’s Alpha internal consistency coefficient were analyzed (see Table 1). Item total correlations for the sensitivity factor of the scale vary between .43 and .59; they vary between .46 and .60 for the reliability factor, and between .32 and .64 for the responsibility factor. Item-total correlation explains the relationship between the scores taken from the scale items and the total score. When the item-total correlation is  $\geq .30$ , then the discriminatory power of the items is considered to be high (Buyukozturk, 2009). Finally, Cronbach’s Alpha internal consistency coefficients

( $\alpha$ ) were calculated to test the reliability of the scale. This coefficient was calculated to be .87 for the sensitivity factor, .84 for the trustability factor, .71 for the responsibility factor of the scale, and .85 for the scale as a whole.

### Conclusion and Suggestions

In the current study, it was aimed to develop a reliable and valid data collection tool that can be used to determine the secondary school students' values. At first, there were a total of 95 items in the scale; then, in light of expert opinion and data obtained from piloting, some changes and additions were made. Following these corrections and additions, a 99-item scale was administered to sampling and then analyses were conducted on the collected data. As a result of EFA, it was determined that the scale items are subsumed under 15 factors. However, by considering the factor structure, the contribution of the factors to the total variance, scree plot graph and comprehensibility of the factors, the scale was decided to be reduced to three factors and then EFA was repeated. During the factor analysis process, a total of 45 items having low factor loadings and overlapping with other items were discarded from the scale. Thus, the scale was reduced to 44 items and then EFA was repeated on this new scale and then three factors emerged, namely "Sensitivity", "Trustability", and "Responsibility". After the factors were named, 14 items were discarded from the scale by the researchers as noncompliant with other items in the scale, although they had high factor loadings, and the analysis was repeated each time an item was discarded. Ultimately, the scale was reduced to 30 items.

The factor loading values of the 14 items in the "sensitivity" factor were found to vary between .48 and .69 and their item-total correlations varied between .43 and .59; the factor loading values of the 11 items in the "trustability" factor were found to vary between .50 and .69 and their item-total correlations varied between .46 and .60, and the factor loading values of the five items in the "responsibility" factor were found to vary between .49 and .60, and their item-total correlations ranged between .32 and .64. The variance explained by the sensitivity factor on its own is 17.75%, the variance explained by the trustability factor on its own is 15.91%, and the variance explained by the responsibility factor is 7.75%. The three factors together explain 41.41% of the total variance. Cronbach's Alpha internal consistency coefficients of the factors were calculated and, it was found to be .87 for the sensitivity factor, .84 for the trustability factor and .71 for the responsibility factor, and .85 for the whole of the scale.

CFA analysis was conducted on the 30-item structure of the scale subsumed under three factors. The goodness of fit values calculated with CFA are:  $\chi^2/sd= 2.93$ , RMSEA= .07, NFI= .88, NNFI= .91, CFI= .92, IFI= 0.92, RMR= 0.07, SRMR= 0.08, and PGFI= 0.72. All of the obtained goodness of fit indices were determined to be sufficient for the model fit. Thus, it was determined that the structure was confirmed.

As a conclusion, the final form of the Values Scale for Secondary School Students consists of 30 items and all the items are scored as "1-never", "2-sometimes", "3-often", and "4-always". There are 14 items in the "Sensitivity" factor of the scale, 11 items in the "Trustability" factor, and five items in the "Responsibility" factor. In the scale, 14 items are reversely scored. The total score can be obtained from the whole scale. As there are different numbers of items in each factor, the scores taken from each dimension must be divided by the item number of the related factor and then converted to a mean between 1

and 4 in order to be comparable to each other. Increasing scores taken from a factor or from the whole scale indicate that the students have positive values.

When the findings obtained in relation to the reliability and validity of the scale are evaluated together, it can be maintained that the scale is a valid and reliable scale that can be used to determine secondary school students' values. In light of the findings of the study, it can be argued that the scale developed within the current study can make important contributions to the literature and can be used within future research. However, if the scale is to be used with student populations other than secondary school students, its reliability and validity should be retested for the target population.

## Notes

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