The Adaptation of the Individual Entrepreneurship Perception Scale to Secondary School Level*

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Abstract

This study aimed to adopt a measurement tool with high validity and reliability to determine the entrepreneurship perceptions of middle school students. Within the scope of the study, validity and reliability studies were carried out to adapt the "Individual Entrepreneurship Perception Scale" developed by Yalçın İncik and Uzun (2017) for the sample of middle school students. The study sample comprised 5-8th-grade students in 12 different secondary schools. It consisted of a total of 486 students. Exploratory factor analysis was applied to the data obtained to test the construct validity of the scale. These results showed that the adapted scale has a 4-factor structure. In testing the construct validity, the scores for the upper and lower groups were compared with the independent group t-test. The sub-factors on the scale were named "self-competence", "planning", "determination," and "openness to learning." The internal coefficient of consistency was determined to be .90 based on reliability analysis on the final state of the scale, which was determined after factor analysis. This study shows that the scale has suitable reliability and validity and can be used especially at the secondary school level.

Keywords: Entrepreneurship, Entrepreneurship Perceptions, Scale Adaptation

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INTRODUCTION

Entrepreneurship is a concept that originates from the French word "entrepreneur" and means "constructive." One of the first to use this concept, Knight (1921) described entrepreneurship as "the ability to profit from uncertain and risky situations." Over time, dozens of different definitions were made about this concept. Some studies refer to the lack of effort to define this concept as being due to its complex structure (Dollinger, 2008). In addition to not having a precise definition, definitions highlighting different points are given in many other sources. Allen (2006) defined entrepreneurship as an "opportunity-oriented, innovative and growth-oriented" mindset or way of thinking. Aytaç (2006) also stated that the concept of entrepreneurship causes innovation and social, cultural, and political mobility beyond economic value generation. In short, entrepreneurship can be defined as all the thoughts, activities, and initiatives about profit under difficult and risky conditions. Entrepreneurship is also a concept directly related to societies and cultural structures.

Entrepreneurship education is one of the most critical sustainable development factors in the world's developed countries. This is because entrepreneurship is considered a "teachable" skill rather than a character trait (Heinonen and Poikkijoki, 2006). In this context, Junior Achievement Young Enterprise student mini-company (SMC) included participation by more than 2 million secondary and high school students in more than 40 countries in Europe and America in the 2005-2006 academic year with the slogan "entrepreneurs are not born, you become an entrepreneur" (Oosterbeek, Praag, & Ijsselstein, 2010). The first examples of entrepreneurship education in the world are from 1980 (Haines, 1988), and the first entrepreneurship education study in Turkey was conducted in 2000 (Girginer & Uçkun, 2004). Although entrepreneurship training has gained importance in Turkey in recent years, there is a difference of about twenty years compared to developed countries (Çetinkaya Bozkurt & Alparslan, 2013). The main reason entrepreneurship education is so essential for developed and developing countries is that it contributes to the development of entrepreneurs who support the economic, cultural and political development of their countries.

When the studies about entrepreneurship education are examined, entrepreneurship education aims to improve entrepreneurship in students who receive this training and to enhance the skills and behaviors of entrepreneurs (Heinonen & Poikkijoki, 2006). Barba-Sánchez and Atienza-Sahuquillo (2017) also stated that entrepreneurship education provides positive attitudes toward being a better entrepreneur as well as the development of knowledge and skills in students. It was stated that entrepreneurship training programs directly affect participant intentions and increased their tendency to engage in entrepreneurial activities (Adekiya & İbrahim, 2016). As understood from these studies, entrepreneurship training aims not only at gaining entrepreneurial knowledge, but also at developing the personality characteristics of entrepreneurial individuals. In this context, changes in the perception of the individual's entrepreneurship characteristics must be identified to determine whether the training has achieved its goal.

When the literature is examined, the "Individual Entrepreneurship Perception" scale was developed by Yalçın-Pearl and Long to determine individual entrepreneurship perceptions. The purpose of developing this scale was to evaluate perceptions of the individual of themselves as entrepreneurs determining their future behavior. Individuals with a high perception of individual entrepreneurship are expected to have high entrepreneurship tendency in the future. This scale was developed to determine the individual entrepreneurship perceptions of university students. It is noted that there is no valid and reliable measuring tool to measure the perception of entrepreneurship for the secondary school age group, given that entrepreneurship education begins at a younger age, both according to the national and international literature. It is thought that this study will provide an essential contribution to resolving this deficiency in the literature.

METHOD

Sample

The data was obtained from students who studied in secondary schools in five different districts of a large-scale province in the Black Sea region in the first semester of the 2019-2020 academic year. In the study, 6 of the 12 schools used to represent the universe were randomly selected, and a questionnaire was applied to 520 students in these schools. Moreover, a total of 486 data from these students were reached. In this context, the study data was obtained by appropriate sampling with the improbable sampling type. Although the sample was not chosen within a probability of the study population, it has cross-sectional features suitable for the research. In the sample, 276 students were girls, and 210 were boys.

Stages of Scale Development

In this study, the scale adaptation steps suggested by Seçer (2018) and Şeker and Gençdoğan (2014) were examined, and a 9-stage procedure was applied by compiling the steps.

Stage 1: Need determination:

The fact that entrepreneurship skills are used in many areas, shaping education policies and affecting the economy, once again reveals the issue's importance. Skills are essential in the entrepreneurship process and all areas (Dilsiz and Kölük, 2005). Learning by individuals who receive entrepreneurship education is associated with entrepreneurship tendencies. (Jeonghwan 2008, Compact: Tanrıverdi, Bayram and Alkan, 2016). In this respect, measuring the efficiency after individual entrepreneurship training will contribute to determining entrepreneurship tendency. Therefore, sufficient measurement tools in terms of reliability and validity are needed in this field.

Stage 2: Identify the appropriate measuring tool to meet the need.

To assess the entrepreneurship tendency, some tools were developed like the thematic perception test (Caird, 2013; Fineman, 1977; Hansemark, 2000), the scale of entrepreneurship tendency (Yilmaz & Sunbül, 2009), the scale of individual entrepreneurship perception (Yalçın-İncik & Uzun, 2017), and the scale of individual entrepreneurship tendency (Şart, 2020). In this study, the individual entrepreneurship perception scale for the university level developed by Yalçın-İncik and Uzun (2017) was adapted to the secondary school level. It is thought that, given the goals of the achievement of entrepreneurship skills for all students (the Eleventh Development Plan, 2019 s. 135), it will significantly contribute to the individual determination of student entrepreneurship level tendency in secondary schools.

Stage 3: Adaptation studies

For adaptation of the scale to the secondary school level, the scale developed by Yalçın İncik and Uzun (2017) was carefully examined to see whether it is suitable for the corresponding level. Expert opinion was taken about whether the original form, prepared with a total of 31 items, complied with the secondary school level. For this purpose, two lecturers with field training, one educational science expert, one Turkish language expert, and one measurement and evaluation expert were consulted. In line with expert opinion, no item was removed from the scale at this stage, as all items aligned with the study's purpose and scope.

Stage 4: Preparation of the physical structure of the scale to be adapted.

In this stage, the procedures for determining the categories for the responses to the 31 items in the item pool and ordering of the items were carried out. For this purpose, the grade categories that are best suited for the scale's items were selected, and the five-degree rating of the original scale (disagree

completely – agree completely) was chosen. The ratings were scored in the range 1-5 from negative to positive. This process followed the ordering and numbering of the items in the form. Items were given random numbers, and the order for the form was determined.

Stage 5: Sampling

At this stage, the selection of the sample, the sampling method, and the level of sampling representing the universe were discussed. Permission was obtained from the Provincial Directorate of National Education to identify students to whom the draft form would be applied in the study. In this context, implementation in the five central districts of a large-scale province in the Central Black Sea region was appropriate. The reason for selecting this province and these district centers is that they can provide sufficient numbers to represent the universe and be economically suitable.

Stage 6: Pilot Study

A total of 31 items on draft form were administered to a small group of students (15 students) with the same characteristics as the target audience. The study was conducted about the level of understanding of the scale and materials. This was carried out under the supervision of at least one of the researchers. The researcher provided students with immediate feedback if they had questions about items or vague statements. Students were requested to fill out the draft scale within 15 minutes. The results indicated that this time was sufficient to complete the survey during the actual process. After the data was collected, the student's answers were examined, and all the questions were answered. As a result of student interviews, it was determined that there were no incomprehensible items.

Stage 7: Actual application

Based on the pilot study findings, the form was implemented in a total of 6 schools in five different districts of a province located in the Black Sea region. A total of 520 students studying in these schools were reached, but 486 data points were obtained.

Stage 8: Validity and Reliability Studies

This stage determines the reliability and validity of the measuring tool. Multiple methods were chosen to determine both reliability and validity. The operations carried out in this section are covered in detail in the findings section. According to Karakoç and Dönmez (2014), it is necessary to carry out a reliability and validity study in scale adaptation studies. Validity studies are done in three ways: interpretive, criteria-based, and construct validity. For interpretative validity, face and content validity are used; this is expert opinion. The validity based on criteria is equivalence and predictive validity and is determined by correlation. The construct validity uses same scale validity, structural equation modeling, or factor analysis. Statistical tests used include correlation and factor analysis. For this purpose, factor analysis were performed to ensure validity in this study. Before validity and reliability were tested, the data check was carried out as follows:

Data transferred to the computer environment were checked for missing, endpoint, or incorrect data entry. It was determined that 42 items were left blank within 15066 cells from 486 students responding to 31 items. These empty items were not systematic; they happened randomly and did not coincide with the same students. The missing data cell/total cell ratio of 0.003 was found. This rate is far below acceptable limits, so statistical correction was made. In this process, a series of average score assignments was made to the empty cell with minimal impact on the result (Hair, Anderson, Tatham, and Black, 1998). This process was followed by converting raw data to standard ratings. This is to determine whether students with scores outside of normal distribution are present. Thus, the aim was to minimize the statistical errors caused by these end values (Tabachnick & Fidell, 2014). The Z score for each item was calculated from the standard score, and no student response was found, with the Z score being less than -3 and greater than +3 (Seo, 2006).

Whether the collected data meets the normality requirement is essential for factor analysis and the use of parametric method. For this purpose, the skewness and kurtosis values of the bullet points were examined. It was determined that all 31 items had a kurtosis value of -1.00 to +1.00, and therefore it was appropriate to continue the study with all of the items included on the scale (Büyüköztürk, 2002).

Stage 9: Reporting

This is presented in detail in the findings section.

FINDINGS

This section contains statistical analysis results determine the reliability and validity of the Individual Entrepreneurship Perception Scale.

Reliability Studies

Reliability is a prerequisite for validity of measuring tools. For validity to be high, in other words whether the measurement tool serves its purpose or not, the reliability level must first be high (Yaman, 2012). The validity and reliability of this scale were examined for the secondary school level based on data collected from university students. The 31-item form was analyzed with student data. Because the rating of the items on this form uses a Likert ranking, the Cronbach alpha method was chosen for reliability first. As a result of this analysis, the internal coefficient of the measuring tool was calculated as 0,91.

Corrected item - total correlation values between the total test score and item points were examined to reduce the number of random errors in this reliability coefficient, which is a high for consistent measurement results. The positive and high levels of these correlation values mean that the level of internal consistency of the test materials is high and the random error is low (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2017). Tavşancıl (2002) stated that the total correlation values should be greater than 0.30. The lowest value for the item-total correlation coefficients obtained in this study, excluding three items, is 0.43. The highest value was 0.62. Three items (16th item .01; 23rd item .08; 28th item .18) were removed from the test as they had low correlation. Although the literature includes information about the extent of adherence to the original scale (Gözüm & Aksayan, 2002), it is possible to decide on the removal of an item based on the total correlation coefficient (Özdamar, 2004). Kalaycı (2002) emphasized that if the level of reliability increases when the item is removed, the item should be removed. It was determined that the 28 items remaining after removing the three items had medium positive relationship with the total test score. These values contribute to the high level of internal coherence of the measuring tool for items, apart from 3 items, during the pre-reliability analysis phase; therefore, these items do not need to be removed. Items are presented as total correlation coefficients with values of .60 and higher; .50 to .59; .49 to .40; and .39 and under in the following table.

Table 1. Corrected item - total correlation results

No	Intervals	Items
1	.60 and above	Item 5, Item 8, Item 12, Item 21
2	.50 to .59	Item 2, Item 3, Item 4, Item 6, Item 9, Item 10, Item11, Item 13, Item 14, Item 15, Item 17, Item 18, Item 19, Item 20, Item 24, Item 26, Item 27, Item 29, Item 30, Item 31
3	.40 to .49	Item 1, Item 7, Item 22, Item 25
4	.30 and under	Item 16, Item 23, Item 28

The Cronbach alpha coefficient was .91 before the 16th, 23rd and 28th items with correlation coefficient below .30 were removed from the test. It was recalculated after the removal of these three items and determined to be .93. Murphy and Davidshoper (1988) classified the reliability coefficient

as: <.60: unacceptable; .61-.79: low reliability; .80-.90: moderate reliability; and >.90: high reliability. The internal reliability coefficient of the measuring tool is high based on these intervals.

Validity Studies

The determination that the reliability level is high for the adaptation to secondary school level of the Individual Entrepreneurship Perception Scale, developed by Yalçın İncik and Uzun (2017) with the data obtained from university students, means that the prerequisite for the calculation of validity is met. Turgut and Baykul (2012) defined validity as the degree to which the measurement tool serves the purpose of development. The validity levels of measuring instruments can be found with different ways and techniques. Nitko (2004) stated that combining multiple methods in determining the validity level of data obtained from the measuring tool is more appropriate for determining fulfillment of purpose. The most commonly used validity types are face validity, construct validity, and content validity. In the development of the original scale, the content and construct validity were examined. The opinion of five experts was consulted for content validity, and the trial form was created by removing items that are not suitable for application. The researchers used factor analysis for construct validity (p. 474). For this purpose, exploratory factor analysis was used to determine the scale's construct validity. Although the researchers did not precisely state what method they used in their study, it was concluded that they used principal component analysis from the article content. Since there was no meaningful relationship between crucial factors, they used the varimax perpendicular rotation technique (p. 475). In this study, the following actions were completed for the scale, adapted from the stages used in developing the original scale:

1. Definition of the problem and data collection: Entrepreneurship has been a concept and skill included in Turkey's compulsory education programs for 12 years since 2013. At the university level, it is also available as mandatory or elective courses in the weekly course programs of many faculties/colleges. In the general culture elective courses of the curriculum implemented since 2018, this skill is given the name "Economics and Entrepreneurship". Developed by Yalçın İncik and Uzun (2017), the Individual Entrepreneurship Perception Scale was intended to reveal entrepreneurship skills of students at university level. Adapted to secondary school, this scale will individually determine the level of student entrepreneurship tendencies. The basic information about entrepreneurship is given in the introduction of the study. The study data was obtained from 486 secondary school students who attended different classes in five different schools.

2. Testing the suitability of the data for factor analysis: Analysis of the data collected in the study started with the validity of the measuring tool and the construct validity. For this purpose, the cross-item correlation was first examined to determine how appropriate the data is for factor analysis. Since it was determined that the correlation coefficients between the items were between .34 and .49, initial evidence in favor of factor analysis was obtained. Following this, new evidence was obtained by using the Kaiser-Mayer-Olkin (KMO) and Bartlett's Globalization (Bartlett's Test of Sphericity-BTS) test results. The KMO value is an essential criterion for sampling adequacy. For this reason, the observed correlation coefficients were compared to the partial correlation coefficients. If the KMO value is less than 50, it means that the correlation between variables cannot be explained by other variables, so factor analysis cannot be performed. Sharma (1996) recommended the following ranges for KMO values: <.50: weak; .50 to .69: medium; .70 to .79: good; .80 to .89: very good and <.90: excellent. The sample qualifies as excellent because the data from the adapted measuring tool had KMO value of .94.

The BTS test checks whether the data comes from multiple normal distributions. There is no relationship between the null hypothesis, but the research hypothesis indicates that the relationship exists. If there is a low coefficient in BTS testing, zero hypotheses are accepted; meaning there is no relationship. When no connection is found, factor analysis needs to be terminated or reviewed (Hair, Anderson, Tatham, and Black, 1998). The p-value should be less than .05 (Büyüköztürk, 2010). This study found that the chi-square value for the BTS was significant (X^2=4975.86; $p<$, 05). Both of the

above analysis results mean that the collected data is suitable for factor analysis and that the sampling is sufficient.

Field (2009) stated that it is appropriate to look at the anti-image correlation coefficients when deciding to perform factor analysis. The anti-image correlation matrix values are used to determine whether items should be included in factor analysis. If the coefficients in the matrix are less than 50, data collection is required (Field, 2009). The anti-image correlation coefficients of 28 remaining items after the removal of 3 items is given below:

Table 2. Anti-image correlation values between items

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	24	25	26	27	29	30	31
Anti-image correlation value	.60	.56	.56	.60	.55	.59	.58	.56	.55	.64	.68	.55	.61	.61	.57	.57	.60	.60	.63	.57	.70	.64	.74	.57	.60	.66	.64	.55

When Table 2 is examined, the anti-image correlation coefficients of the items range over .15; the highest correlation coefficient is .70 and the lowest coefficient was found to be .55. It was decided to use factor analysis to investigate the adaptation of the Individual Entrepreneurship Perception Scale to the secondary school level.

3. Determination of the fundamental components of the variable covered by factor analysis: Factor analysis is a multivariate statistic that aims to find and discover a small number of conceptually meaningful new variables (factors, dimensions) by bringing together a large number of interrelated variables (Büyüköztürk, 2002). The primary purpose of factor analysis is size reduction. Size reduction occurs in two ways: confirmatory factor analysis (CFA) and exploratory factor analysis (EFA). EFA is used to determine the most appropriate number of factors for data collected from the sample and determine if the hidden dimensions of variables measured with the items are present (Brown, 2015). It is recommended that two critical conditions be considered when selecting the variance to be used in factor analysis. These are the decisions to work with t total variance or common variance (Yaşlıoğlu, 2017). Tabachnick and Fidell (2014) stated that it is appropriate to use the analysis of the main components in determining the factor structure of the measuring tool. Principal component analysis was preferred in this study because the aim was to examine the adaptation of the scale to secondary school level and consider total variance. At the end of the analysis, there were four factors with an eigenvalue greater than 1.00 on the scale. Also, the scree plot was used to provide evidence for factor numbers.
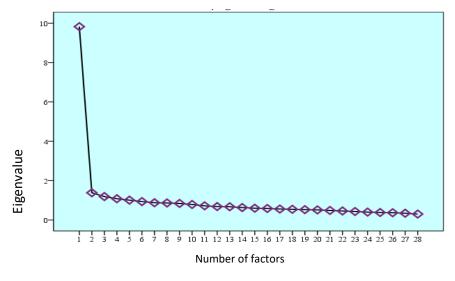

Figure 2. Scree plot

According to Figure 2, a two-factor structure emerges when taking both the scree plot and the values into account in determining the number of factors in the adapted scale. The eigenvalues are

taken into account to determine the estimated number of factors in the scale and the variance calculation described by the factors that generate the scale. Many researchers recommend a value of 1.00. When the core value falls below 1.00, there will be no significant contribution to the total variance for the value of the variables that the factor can explain. The scree plot is an image of the amount of variance explained by each factor. Interpretation is made by considering the variation between breakpoints on the scree plot. Field (2009) acknowledged that scree plots provide more robust evidence of the factor structure as the sample grows. The graph above is seen to have single-factor structure, but the eigenvalue was determined to be more than 1.00 for four components. The factor analysis of the original scale found a 6-factor structure. In the original scale, the eigenvalue for the first factor was relatively high, as in the adapted scale. Therefore, in this study, the 4-factor structure was adopted considering the eigenvalues. Table 3 includes the factor load values of scale elements and the descriptive statistical results.

Table 3. Factor load values and descriptive statistical results for scale items

Items	Factor1	Factor2	Factor3	Factor4	$\bar{X}$	S
Item 27	.68				3.96	1.13
Item 30	.61				3.75	1.17
Item 20	.60				4.01	1.06
Item 25	.59				3.95	1.16
Item 17	.58				4.11	1.11
Item 26	.49				4.17	1.13
Item 21	.43				3.99	1.09
Item 6		.75			3.92	1.18
Item 15		.71			4.02	1.21
Item 8		.62			4.09	1.11
Item 22		.54			3.97	1.11
Item 13		.52			3.78	1.22
Item 14		.52			4.00	1.19
Item 3			.71		3.86	1.16
Item 4			.71		3.88	1.19
Item 2			.70		4.05	1.03
Item 9			.55		3.79	1.16
Item 1				.84	4.05	1.15
Item 5				.57	4.00	1.09
Item 7				.53	3.95	1.15

When Table 3 is examined, the adapted scale consists of 4 factors. Items 16, 23, and 28 were removed from the measuring tool in the pre-reliability study. After these items, 28 items were analyzed. There were items loaded on more than one factor. The differences between the values for the items loaded on each factor were examined. If the difference between the factor load values of the items within this scope is less than 10 (Osborne & Fitzpatrick, 2012), it poses a significant risk to the construct validity. These items were excluded from the process. The item numbers 10, 11, 12, 16, 18, 19, 24, 29, and 31 were excluded at this stage. The reason for excluding these items is that any item in the measuring device should only measure one characteristic (Çokluk, Şekercioğlu, and Büyüköztürk, 2012). As a result of the analysis, the first factor consisted of 7 items, the second factor 6, the third factor 4, and the fourth factor included 3 items. Therefore, the final version of the measuring tool consisted of 20 items. MacCallum, Widaman, Zhang, and Hong (1999) said that a factor that improves the measuring instrument should contain at least three items. All four factors in the measuring tool comprise at least three items.

Factor load values are also important evidence for the construct validity of the measuring tool. The classification by Comrey and Lee (1992) determined the following intervals for factor load values of the items: >.70: excellent; .70 to .63: very good; .55 to .62: good; .54 to .45: normal; and <.44: bad.

When factor load values of the adapted measuring tool are examined, 5 items had excellent, 2 items very good, 7 items good, 5 items normal, and 1 item had poor factor load. The table showing the total variance contribution of each factor and the items included in each factor is presented below:

Table 4. Variance results for sub-factors of the scale

Factors	Number of items	Items	Eigenvalue	Explanation Variant
Factor1	7	17 - 20 - 21 - 25 - 26 - 27-30	7.11	35.55
Factor2	6	6 - 8 - 13 - 14 - 15-22	1.29	6.46
Factor3	4	2-3-4-9	1.10	5.48
Factor4	3	1-5-7	1.04	5.21
Total	20	20		52.71

As shown in Table 4, the first factor of the measuring tool consists of 7 items, and it explains 35.55% of the variance. The second factor includes six item and explains 6.46% of the variance; the contribution of the third factor containing four items is 5.48%. The last factor consists of 3 items, and it explains 5.21% of the variance. When these data are examined, the higher the number of items in the factor, the more it contributes to the explained variance. The first factor alone has very high variance value. The items included in the factors were examined in detail by considering the literature. After comparisons with the original scale factors, the factors were named. Accordingly, the factors are named in order: "self-competence," "planning," "determination," and "openness to learning."

Different methods can also determine if the factors are properly configured. Some of these methods may involve the correlation between factors, group differences, or external tests (Çakmur, 2012). The results found by examining whether there is a relationship between the factors on the measuring tool are given below. To explain the values obtained with these analyses, the classification designed by Büyüköztürk (2002) was used. This classification is as follows: $\pm$ .00 to $\pm$ .29 low; $\pm$.30 to $\pm$.69 medium; and $\pm$ .70 to $\pm$ 1.00 high. The following table lists the correlation coefficients between the factors:

Table 5. Correlation coefficients between the sub-dimensions of the scale and the total scores

Factors	Factor1	Factor2	Factor3	Factor4
Factor 2	.66			
Factor 3	.61	.56		
Factor 4	.58	.57	.47	
Average	.89	.87	.78	.74

When Table 5 is examined, sub-dimensions have moderate positive relationship. Among the sub-factors, the highest relationship was between Factor 1 and Factor 2 (rxy =.66; p <.01), while the lowest relationship was between Factor 2 and Factor 3 (rxy =.47; p <.01). There was a high-level relationship between the mean score of the measuring tool and the sub-factors. The highest relationship was between Factor 1 with the mean score (rxy=.89; p<.01), while the lowest relationship was between Factor 4 with the mean score (rxy =.74; p <.01).

The cross-group method compares the points for the upper and lower groups with the test construct validity (Yaman, 2012). In this analysis, the increase in the differences between the mean scores of the upper and lower groups can be used as proof, although not very strong, of the measuring tool's construct validity. Table 6 provides the analysis result for comparing scores of these groups:

Table 6. T-test results for independent groups in the opposing group method (Lower-Upper N:132; sd:262)

Factors	Group	$\overline{X}$	S	t	p
Factor1	Lower	3.15	.56	29.55	.000
	Upper	4.75	.28		
Factor2	Lower	3.00	.49	37.00	.000
	Upper	4.79	.26		
Factor3	Lower	3.06	.66	26.54	.000
	Upper	4.77	.33		
Factor4	Lower	3.04	.85	19.71	.000
	Upper	4.66	.41		
Average	Lower	3.07	.33	51.70	.000
	Upper	4.75	.17		

As shown in Table 6, there is a significant difference between sub-factors and average scores of students in opposite groups in the sample. The most considerable difference between the upper and lower groups occurred in Factor 2, while the lowest difference was seen in Factor 4. These results can be considered additional evidence for the construct validity of the adapted measuring tool.

Explanations for the Factors of the Measurement Tool

The original scale consists of 31 items and six sub-factors. The sub-factors on the scale were called "planning," "control focus," "self-confidence," "communication," "motivation," and "self-discipline," respectively. The factor analysis results in the adaptation study showed that the measuring tool was loaded on four sub-factors. Eleven items in the original scale (10-11-12-16-18-19-23-24-28-29-31) were excluded from the test adapted to secondary school level because they reduced the reliability level or were loaded on more than one factor with similar load values. Therefore, the adapted measuring tool contained 20 items.

Level of reliability of the measuring tool

The Cronbach alpha reliability coefficient of the original measuring tool was .92. The reliability coefficients for the subdimensions were planning .80; control focus .84; self-confidence .75; communication .72; motivation .75; and self-discipline .60. The Cronbach alpha reliability coefficients for the 20 items and sub-factors in the final form of the adapted measurement tool, as well as the coefficients obtained by the test-half test method are presented in the table below.

Table 8. The reliability coefficients for the overall average score of the measuring tool and each sub-dimension

Factors	Number of items	Items	Cronbach Alpha Method	Test Radiation Method (Spearman-Brown)
Factor 1	7	17 - 20 - 21 - 25 - 26 - 27-30	.79	.77
Factor 2	6	6 - 8 - 13 - 14 - 15-22	.79	.79
Factor 3	4	2-3-4-9	.74	.78
Factor 4	3	1-5-7	.67	.63
Total	20	20	.90	.87

While the Cronbach alpha reliability coefficient for all the adapted measurement tool items is .90, the reliability coefficients of the sub-factors were calculated as .79, .79, .74 and .67, respectively. These values are accepted as proof that the measuring tool provides consistent results for social science studies.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Measuring tools are developed to measure specific characteristics and characteristics of a particular group. They may be effective in measuring the characteristics of the target group, but the

same impact may not occur in different groups (Aker, Dündar, and Pekşen, 2005). In this case, there are two methods given when the relevant literature is examined, and a gap in the field is determined: A) new scale development and B) adaptation of an existing scale. Güngör (2016) stated that both paths have their strengths and weaknesses. For example, while adapting a scale, it must be easy to adapt because it consists of items that previously contributed to validity and reliability.

In contrast, these items may be a limitation if they do not provide the same results in the adapted target group. In this study, similar situations were encountered when adapting the items on the Individual Entrepreneurship Perception Scale, developed by Yalçın İncik and Uzun (2017), to the secondary school level. Also, validity and reliability of the scale were examined for university students. Firstly, the researchers tolerated the time loss due to creating a pool of items using the prepared material of the scale. Five experts provided opinions about suitability of the items on the scale for the secondary school level. Before the implementation, a pilot application of the scale was held with 15 secondary school students to examine both the appropriate time for implementation and the student's understanding of the items. Then, the scale was applied to 486 students, and validity and reliability studies were carried out. Factor analysis was performed to determine whether the data from the target group was suitable and the anti-image correlation value was examined. The correlation coefficients of the items were determined to be between .55 and .70. The Kaiser-Meyer-Olkin and Bartlett's globalization test results also showed that the sample data was suitable for factor analysis. However, when analysis results were examined, 11 items on this scale were not in line with the target group of secondary school students during the adaptation studies. Three of these 11 items were not included in further processing of the measuring tool because it reduced the reliability level. The other eight items were excluded from the scale because they were loaded on more than one factor and the difference between the loading values was less than 10.

A new factor structure was introduced as a result of a significant amount of items being removed from the measuring tool, and accordingly, the factors were renamed. The difficulty in naming the new factor structure may be considered one of the weaknesses of scale adaptation studies. Because significant changes were made the theoretical structure of the original scale, a system has to be constructed. When the factor structure of the original scale is examined, it had a six-factor structure. These factors were called "planning, control focus, confidence, communication, motivation, and self-discipline". In this study, the adapted scale had four factors. These factors were "competence, planning, determination and openness to learning." When the items removed after factor analysis of the scale are examined (items 10-11-12-16-18-19-23-24-28-29-31 on the original scale), these items were included in the control focus, confidence, motivation, and self-discipline factors on the original scale. It was noted that these items usually contain future expressions and may not be sufficiently meaningful to students.

When the items in the first factor of the adapted scale, called "self-efficacy," were examined, it included items in the self-confidence, communication, motivation, and self-discipline factors of the original scale. The second factor, "planning," is a mixture of items from the planning, control focus, confidence, and communication factors on the original scale. The third factor, "stability," is a mixture of the planning and control focus factors on the original scale. The last factor is "openness to learning," which was also created by combining some elements in the "planning and control focus" factors of the original scale. In this context, the items in the new factors during adaptation of the scales were carefully read for naming. Within the basic framework of the theoretical structures, three different researchers named the factors simultaneously, and decisions were made about which factor names were most appropriate. Based on the Cronbach alpha order, the internal consistency coefficients for each factor created by factor analysis was analyzed. The Cronbach alpha values were .79, .79, .74 and .67, respectively, and the internal coefficient for consistency of the entire scale was .90. Based on these results, it is thought that the individual entrepreneurship perception scale is valid and reliable for middle school students and is a suitable measurement tool for use.

Entrepreneurship features were researched in many studies from the past to the present. Uygun, Mete, and Güner (2012) examined entrepreneurial personality characteristics in 7 dimensions.

These dimensions were perseverance/determination, motivation for success, autonomy, curiosity and desire for learning, confidence, tendency to take risks, and innovation/creativity. Çetinkaya Bozkurt and Alparslan (2013) compiled many of the entrepreneurship studies in the literature and collected the key features found in an entrepreneur in 18 heading. These headings were innovative, risk-taking, change-oriented, focused on opportunities, creative, advanced communication skills, proactivity, high-success drive, emotional intelligence, insistence on decisions, taking risks, confidence, need to succeed, innovation, creativity, and good communication. Entrepreneurs were defined as finding it easy to solve problems and having emotional intelligence. The concepts of "self-efficacy, planning, determination, and openness to learning," which emerged by renaming the factor structures of the scale during the adaptation of the individual entrepreneurship perception scale to the secondary school level, are also in line with other dimensions in the literature. These dimensions are considered to support the other concepts in the literature.

As a result of this study, the validity and reliability analysis of this scale were completed and will guide entrepreneurship studies carried out in Turkey with increased popularity in recent years. This adapted scale will be used by researchers working in the field of entrepreneurship and to evaluate studies commissioned by teachers on developing entrepreneurship skills in teaching programs. Heinonen and Poikkijoki (2006) suggested that the priority must be the determination of entrepreneurship initiatives, followed by action after the presentation of knowledge and experience. The "Individual Entrepreneurship Perception Scale" can measure changes that will occur in the individual entrepreneurship perceptions of students after entrepreneurship training. It is recommended that this scale be used at different times during secondary school to determine the changes in individual entrepreneurship perceptions that occur in students undergoing entrepreneurship training. Because the scale was adapted with a limited sample, it is possible to compare the results by working with broader samples. In this case, as evidence of the structure of the scale, in addition to exploratory factor analysis, correlation coefficients between the item and total scores on the scale and the scores of the upper and lower groups were analyzed with the independent groups t-test. Researchers are advised that confirmatory factor analysis may be conducted in future studies to examine the suitability of the scale's factor structure. Using this scale, research can be conducted about how student entrepreneurship perceptions differ based on different variables.

Conflicts of Interest:

No potential conflict of interest was declared by the authors.

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Author 2: Writing- Original draft preparation, Investigation, Visualization.

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Addition. Examples of Adapted Scale Items

Original Item No	New Item No	Item	Completely disagree	I do not agree	Undecided	I agree	Completely Agree
		Factor 1: Self-Efficacy					
17	1	I have full confidence in completing a task I started.	1	2	3	4	5
20	2	**********	1	2	3	4	5
21	3	**********	1	2	3	4	5
25	4	**********	1	2	3	4	5
26	5	**********	1	2	3	4	5
27	6	**********	1	2	3	4	5
30	7	I can anticipate the obstacles I might encounter in a new job.	1	2	3	4	5
		Factor 2: Determination					
6	8	I don't mind asking questions	1	2	3	4	5
8	9	**********	1	2	3	4	5
13	10	**********	1	2	3	4	5
14	11	**********	1	2	3	4	5
15	12	**********	1	2	3	4	5
22	13	I identify the strengths of the things I do.	1	2	3	4	5
		Factor 3: Planning					
2	14	I plan activities that will address my knowledge requirements in my profession.	1	2	3	4	5
3	15	**********	1	2	3	4	5
4	16	**********	1	2	3	4	5
9	17	I identify the resources to bring my ideas to life.	1	2	3	4	5
		Factor 4: Openness to learning					
1	18	**********	1	2	3	4	5
5	19	**********	1	2	3	4	5
7	20	I'm aware of my weaknesses.	1	2	3	4	5