

# The validity and reliability analysis of the Turkish version of the 8-item passion scale<sup>☆</sup>

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## ABSTRACT

**Aim:** The aim of this study is to conduct the validity and reliability analysis of the Turkish version of the 8-item Passion Scale.

**Materials and method:** The methodologically designed study was conducted with 155 university students. “Descriptive Characteristics Form”, “Passion Scale”, and “Grit-S Scale” were used to collect data. Language and content validity, construct validity and reliability value determination tests were conducted respectively.

**Results:** The content validity analysis revealed high agreement rate among expert opinions regarding scale items (CVI = 0.93). Exploratory factor analysis found that the scale has a single-factor construct explaining 51.9% of the total variance. The results of the confirmatory factor analysis indicated that the model is around the borders of admissible fit index and factor loads varied between 0.51 and 0.83. The Cronbach Alpha Coefficient for the reliability of the scale was calculated as 0.864.

**Conclusion:** The results of the study showed that the Turkish version of the Passion Scale is valid and reliable, thus, can be used to evaluate overall success grit in an objective manner.

## 1. Introduction

Philosophers have long argued that people will not find a purpose or meaning in their lives unless there is passion and define passion as the reasons underlying behaviors (Curran, Hill, Appleton, Vallerand, & Standage, 2015). Despite this, passion has not received well-deserved attention from researchers. In 2003, Vallerand et al. defined passion as the strong inclination of an individual toward an activity which she likes (even loves), finds significant, spend time and energy on it and explained the concept of passion through Dualistic Model of Passion. According to the model, passion has two types: Harmonious passion and obsessive passion. Harmonious passion is defined as the autonomous internalization of the activity into the individual's identity without any external influence. Obsessive passion, on the other hand, is the controlled internalization of the activity participation through personal or interpersonal pressure or facts (social acceptance, self-respect) (Vallerand et al., 2003). In harmonious passion, the activity doted upon is implemented in the individual's life in harmony with the other activities. There is voluntary participation in the activity and it is autonomously internalized. According to the model, individuals with high harmonious passion are more flexible and careful toward the activity, more modest and less defensive during the activity. In contrast, in

obsessive passion, there is conflict between the doted activity and other life outcomes. The individuals feels obliged to participate in the activity, and there is controlled internalization through personal or interpersonal pressure (Vallerand, 2010). The feelings of social acceptance and self-value attached to the activity also bring certain personal negative feelings such as a sense of guilt, sadness and shame in case of not participating in the activity. Obsessive passion, in opposition to harmonious passion, individuals are more strict and insistent due to the controlling nature of the obsessive passion; they are also inclined to be ego-centric and exhibit behaviors of rage, anxiety and not being able to concentrate during the activity (Vallerand, 2016, pp. 31–58).

The studies have also focused on the two different dimensions of passion as positive and negative. Some of the studies suggest that passion causes loss of control and rationale and see individuals as the slaves of their passion (Vallerand, 2016, pp. 31–58). Yet, other studies are more positive and report individuals as more active when it comes to their passion (Curran et al., 2015). The studies on passion mostly concentrated on work performance (Bureau, Razon, Saville, Tokac, & Judge, 2017; Butt, Tariq, Weng, & Sohail, 2019; Forest, Mageau, Sarrazin, & Morin, 2011; Li, Zhang, & Yang, 2017; Vallerand, 2008, 2010); and there have been limited studies on educational passion. These limited studies regarding education indicated that passion is also

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important in educational context and it affects both the teachers' and students' performances (Bureau et al., 2017; Coleman & Guo, 2013; Gilal, Channa, Gilal, Gilal, & Shah, 2019; Ruiz-Alfonso & León, 2016, 2017). For example, Coleman and Guo used the term "passion for learning" to define a student's interest in a certain area. They focused on the teachers' passion for teaching or their passion for the subject they teach. (Coleman & Guo, 2013). Passion is associated with students' performance, intentional practice, permanence, goal-orientation, motivation for learning, flexibility and welfare (Ruiz-Alfonso & León, 2017). As the student's passion increases, their tendency to improve self-competency also increases (Gilal et al., 2019).

An 8-item Passion Scale was developed by the Learning and Skill Improvement study group to assess overall passion for success and it was implemented on students (Hermundur Sigmundsson, Monika Haga, & Fanny Hermundsdottir, 2020). The theoretical perspectives on development and learning emphasize the significance of experience, practice and originality in order to be skillful (Lerner et al., 2019). Thus, 8-item Passion Scale is designed in a way that attempts to reveal individuals' participation, commitment and effort toward a very important value/preference. The scale also measures mental and psychological conditions such as positive attitude, intrinsic motivation and positive self-perception. The 8-item Passion Scale is a tools that focuses on a person's passion for a field/theme/skill and is self-evaluative (Hermundur Sigmundsson, Haga, & Hermundsdottir, 2020a, 2020b, 2020c). The 8-item Passion Scale was studied in terms of the relationship between passion, grit and mindset in footballers (Sigmundsson, Clemente, & Loftesnes, 2020) and young adults (H. Sigmundsson et al., 2020a, 2020b, 2020c). In these studies, it was emphasized that passion is probably the reason why some individuals offer too much time, effort and hard work to reach a field/theme/skill (H. Sigmundsson, F. M. Clemente et al., 2020; H. Sigmundsson et al., 2020a, 2020b). But, the 8-item passion scale is not adapted to another language. This scale is believed to be a short and beneficial instrument for prospective studies on passion for education.

The number of studies that focus on the effects of passion in education contexts is gradually increasing (Kelecsek, Altıntaş, Feyza, & Aşçı, 2015; Turgut, 2013); however, it has not been dealt with within the scope of education. The 8-item Passion Scale, developed to objectively measure overall passion for success, is a short tool which can also be used in the field of education. Hence, this study conducted the validity and reliability analysis of the Turkish version of the 8-item Passion Scale with nursing students.

## 2. Materials and Methods

### 2.1. Study design and sample

In this methodological study, the validity and reliability of the 8-item passion scale developed by Sigmundsson et al. (Hermundur Sigmundsson et al., 2020a, 2020b). This study was conducted with nursing students of the faculty of a university district in the South of Turkey. For cultural adaptation of scales, in order to conduct psychometric analysis, it is suggested to have a sample size that is between 10 and 20 times more of the number of items in the scale (Büyüköztürk, 2018). In this regard, based on the number of items in the scale, 155 voluntary students with Turkish literacy, agreed to participate in the study and has no psychiatric diagnosis, participated in the study. As the 8-item Passion Scale, developed by Sigmundsson et al. (Hermundur Sigmundsson et al., 2020a, 2020b, 2020c), is implemented to university students; this adaptation study also worked with university students. The 8-item Passion Scale was named as Passion-Tr for the Turkish adaptation in this study.

### 2.2. Instruments

#### 2.2.1. Descriptive characteristics form

The Descriptive Characteristics Form, developed by the researchers, consisted of questions on students' demographic features such as age, sex, class, income level and marital status.

#### 2.2.2. Passion scale

The Passion Scale developed to assess level of passion for success consists of 8 items under a single dimension in 5-point Likert type format. The highest score from the scale is 5 (very passionate) and the lowest is 1 (not passionate at all). The higher the score, the more passion for success. There are no reversely coded items. The scale has no cut point. The total Cronbach Alpha Coefficient of the scale in the original study was found as 0.86 (Hermundur Sigmundsson et al., 2020a, 2020b, 2020c).

#### 2.2.3. Grit- S scale

The Short Grit Scale developed by Duckworth and Quinn (2009) and adapted into Turkish by Sarıçam, Çelik, and Oğuz (2016), is a 5-point Likert type measurement tool used for self-assessment. The scale consists of eight items and 2 sub-dimensions (consistency of interest and perseverance of effort). The Cronbach Alpha value of the scale adaptation was 0.82 (Sarıçam et al., 2016), and it was 0.864 in this study.

### 2.3. Data collection

The data of the study were collected from students who were taking classes and agreed to participate in the study. After the researcher made explanations about the study, students from whom written informed consent was obtained were given data collection tools and they were asked to complete the forms within 15–20 min in the classroom environment.

### 2.4. The process of cultural adaptation

#### 2.4.1. Language validity

The cultural adaptation process of the scale was made up of three stages: (1) language validity, (2) content validity and (3) pilot application (Arafat, Chowdhury, Qusar, & Hafez, 2016). For language validity, the scale was translated from English into Turkish by two independent people who are fluent in both languages. The two translations were combined by two people who are fluent in English with agreement and turned into a single tool. The combined translation was then, back-translated from Turkish to English by a translator who is fluent in both written and oral skills of the two languages. The English translation was compared to the original English scale. This comparison revealed no changes in meaning of the item and the scale's language validity was finalized.

#### 2.4.2. Content validity of the scale

Davis technique was used to test content validity. According to Davis technique, maximum 20, minimum 3 experts are suggested. In this technique; the total of the rating scales of 3 = Suitable and 4 = Very Suitable in all expert forms for each prospective item is divided into the total number of experts to calculate Content Validity Index (CVI). The item with 0.80 CVI were accepted as sufficient for the content validity and those lower than 0.80 were found insufficient and thus, eliminated (Davis, 1992).

### 2.5. Psychometric testing of the passion

#### 2.5.1. Validity

Exploratory Factor Analysis (EFA) and confirmatory factor analysis (CFA) methods were used to determine the scale's construct validity. Prior to the Exploratory Factor Analysis (EFA), Bartlett's Test of

Sphericity and Kaiser-Mayer-Olkin (KMO) tests were used to determine the sufficiency of the scale content and sample size. For the sample size to be suitable for factor analysis, it needs to have a KMO of 0.60 or above and a statistically significant Bartlett's test of Sphericity result (Büyükoztürk, 2018).

EFA and Varimax rotation principal components analysis that are used to put correlational items in a single cluster, were implemented in order to test the construct validity of the scale (Büyükoztürk, 2018). Following EFA, CFA was also implemented to support the findings of the scale. The Goodness of Fit Index of the model was examined as a result of the CFA;  $\chi^2/sd$  rate  $\leq 5$ ; RMSEA (root mean square error of approximation)  $\leq 0.08$ ; and GFI (Goodness of Fit Index), CFI (Comparative Fit Index) and IFI (Incremental Fit Index) values were above 0.90 and this indicated that the model is within the acceptable fit indices (Arafat et al., 2016; Büyükoztürk, 2018).

Additionally, Pearson correlation coefficient between the total score from the Turkish Grit-S scale, as a similar scale, and the Passion scale were calculated as it was done in the original analysis of the Passion scale to support the construct validity.

2.5.2. Reliability

The total score correlation coefficients of the 8 items and Cronbach Alpha Coefficients for the internal consistency of the scale items was calculated to determine the scale's reliability. A re-test was implemented with 30 participants reached 3 weeks after the first implementation was also done to evaluate the invariance of the scale over time. Pearson Product-Moment Correlation Coefficient was calculated for the test-re-test method.

2.6. Statistical analysis

The study data were analyzed through SPSS 23.0 for Windows software (SPSS Inc, Chicago, Illinois) and AMOS 24.0. The examination of socio-demographic data was done through descriptive statistics such as percentage, frequency, median, minimum-maximum values, mean and standard deviation. Analyses regarding content validity rate (CVR) and content validity index (CVI) values were completed to determine the content validity of the scale. EFA and CFA techniques were used for the construct validity of the scale. Principal components analysis was used in the exploratory factor analysis. Bartlett's Test of Sphericity and Keiser-Mayer-Olkin tests were implemented to determine the adequacy of scale content and sample size. The factor constructs and factor loads of the scale were examined through confirmatory factor analysis. A path diagram for the model was formed with the help of the AMOS software. T-test and Pearson Correlation test were used between paired groups to determine the relation between repetitive measurements. The significance level was accepted as 0.05.

2.7. Ethical consideration

Sigmundsson was contacted via e-mail in the adaptation process of the scale into the Turkish culture and the needed permission was collected to use the Passion-Tr scale in this study. The ethical rules of the study were evaluated and approved by the Ethics Board (E.7084/08). The participating students offered their written consents after being informed about the study.

3. Findings

The mean age of the 155 students in the study is  $19.81 \pm 1.19$  (min = 18, max = 23), 65.2% of whom were female, 41.9% were 2nd year students, 58% had less income than their expenses.

3.1. Content validity

The English and Turkish versions of the scale were presented to

experts for content validity. Both versions were sent to 10 faculty members as experts in their fields (four of which were from Surgical Diseases Nursing, three from Internal Diseases Nursing a done from Public Health Nursing and two from Child Development Department). Davis technique was implemented for content validity. The average of CVI values of the draft scale were found as 0.93 and observed that it varied between 0.60 and 1.00.

3.1.1. Pilot application

Upon receiving feedback from the experts, the scale was implemented to a group of 10 people. As each item was found as understandable in the pilot application, no changes were made in the scale. Passion-Tr implemented in the pilot application was accepted as the final version of the scale.

3.2. Psychometric test results

3.2.1. Validity

Prior to factor analysis, KMO sample adequacy test and Bartlett's Test of Sphericity were done to see whether the sample is sufficient and factor correlation matrix is fit. The KMO results was calculated as 0.881 and Bartlett's Test of Sphericity was found as  $\chi^2 = 486.131$  ( $P = 0.000$ ). Firstly, EFA was done to determine the sub-scale numbers in Passion-Tr. The analysis revealed that Passion-Tr has a single-factor construct with a self-value of above 1.00. The stability of the relation between factors was ensured through Varimax method in factor analysis, and seen that it explains 51.903% of the total variance and gathers them under one factor. All items (8 items) in Passion-Tr were kept the same as the original scale (Table 1).

Confirmatory factor analysis was done to assess the construct validity of the Turkish adaptation of the Passion Scale. The model was deemed within the limits of goodness of fit index as the RMSEA value of the model was 0.91; chi-square was statistically significant ( $\chi^2 = 486$ ;  $n = 155$ ,  $sd = 214$   $p = 0.00$ ),  $\chi^2/sd = 486/214 = 2.28$ , CFI value was 0.945 and GFI value was 0.927. The path diagram formed as a result of

**Table 1**  
Item-score for the Passion-Tr and distribution of item-total correlations.

	Mean (SD)	Factor loading	Explained variance	r	Cronbach's alpha
4. I have passion enough to become very good in the area/theme/skill I like	3.72 (1.04)	.831	51.903	.821	.864
3. I think I could be an expert in one area/theme/skill	3.79 (.99)	.775		.761	
8. My passion is important for me	3.83 (.95)	.762		.754	
6. I have a burning passion for some areas/theme/skills	3.64 (.97)	.737		.733	
2. I would like to use a lot of time to become good in that area/theme/skill	3.44 (.96)	.731		.720	
1. I have an area/theme/skill I am really passionate about	3.45 (1.04)	.696		.697	
7. I use lot of time on the projects I like	3.24 (1.13)	.625		.656	
5. I work hard enough to fulfill my goals	3.38 (.93)	.573		.592	

Note: Passion - Tr means passion for success - a scale translated into Turkish and measures passion for success. There is no reverse scoring. SD = standard deviation, r = item-total correlation.

confirmatory factor analysis is presented in Fig. 1. The factor loads of the scale items varied between 0.51 and 0.83 in the path diagram. In this regard, factor analysis confirmed the construct of the Turkish scale (Fig. 1).

When the correlational bond between two similar scales is observed to support the construct validity, the Pearson Correlation Coefficient between total score Passion and total score Grit-S scales was calculated as 0.442 (Table 2).

3.2.2. Reliability

The Pearson product-moment correlation analysis which showed the fitness between the mean scores of the re-test of Passion-Tr found a statistically strong and positive relation between the two measurements ( $r = 0.919$ ;  $p = 0.00$ ; Table 3). The variance between the dependent groups as a result of the two measurements of the draft scale done at a 3-week interval was examined through *t*-test. The variance between the two implementations was found as statistically insignificant ( $t = 0.725$ ;  $p = 0.474$ ; Table 3).

The item-total score correlation coefficients of the 8 items, as a result of the item analysis based on correlation for Passion-Tr varied between 0.59 and 0.82 (Table 1).

Cronbach Alpha as the internal consistency coefficient used to calculate the reliability of the Passion scale was calculated. The overall reliability of the scale was found high as  $\alpha = 0.864$  (Table 1). The mean score of the students gathered from the students was calculated as  $3.57 \pm 0.72$ .

4. Discussion

As a result of the Turkish validity and reliability, the 8-item Passion Scale, developed to evaluate the overall passion for success, was found to meet language, content, construct validity and reliability criteria and

**Table 2**  
Test-retest analysis of the Passion-Tr.

Items	N	Test Mean $\pm$ SD (min-max)	Retest Mean $\pm$ SD (min-max)	t – Testi P	r p	
Passion	8	30	3.69 $\pm$ .71 (2.38–5)	3.65 $\pm$ .76 (2.26–5)	.725 .474	.919 0.00

t-Testi = Paired Sample t Testi.

r = Correlation between two measurements.

**Table 3**  
Correlation relationship between Passion-Tr and Grit scale.

	Passion
Consistency of interest	$r = .322$ $p = .000$
Perseverance of effort	$r = .533$ $p = .000$
Grit Total	$r = .442$ $p = .000$

can be easily implemented for students. In conclusion of the completed analyses, the original form of the scale was maintained and no changes were made.

The literature reports that for content validity, content validity index needs to be minimum 0.80 (Davis, 1992). The expert opinions of the content validity analysis from our study, in other words, the content validity index was found quite high (0.93) and that the scale meets content validity criteria.

It is observed that relevant studies used KMO coefficient and Bartlett’s Test of Sphericity to test scales in terms of construct validity (Arafat et al., 2016; Büyüköztürk, 2018). The results from the relevant studies suggest that KMO value of above 0.60 and closeness to 1 is an indication of the data’s suitability for factor analysis. Factor analysis can be implemented when KMO value is above 0.50; and KMO value between 0.70 and 0.80 shows average; between 0.80 and 0.90 good; and above 0.90 shows perfect sample adequacy (Tavşancıl, 2006). When Bartlett’s Test of Sphericity is significant, it means that the correlation matrix of the scale items is fit for factor analysis (Arafat et al., 2016; Büyüköztürk, 2018). Similarly, this study also implemented KMO coefficient and Bartlett’s Test of Sphericity and found KMO value as 0.881 and Bartlett’s Test as significant ( $p = 0.000$ ). When these findings are evaluated, study sample size is deemed sufficient for factor analysis and factor analysis can be conducted for the scale. When assessing the results of exploratory factor analysis, it is needed to consider whether the scale has a single-factored or multi-factored structure. While the total variance in single-factored scales is expected to be at least 30%, this number is required to be higher in multi-factored scales (Kalaycı, 2009). According to the EFA result of this study, the scale presented a single-factored structure and that it explains 51.903% of the variance (Table 1). This finding indicated that Passion-Tr scale items are at a sufficient validity level and each item is sufficiently related to the scale. EFA was not implemented for the construct validity of the original Passion scale; instead, Pearson correlation coefficient was calculated between Passion scale total score and Grit-S scale total score for construct validity and it was found as 0.39. Similarly, this study calculated the Pearson correlation coefficient between the two scales as 0.442 (Table 2). No other language adaptations of the scale were found in the literature as it is a recently-developed tool. This study implemented EFA to Passion scale for the first time and understood that scale is single-factored.

At the last stage of the study’s validity analysis, in CFA, the factor loads and scale fitness values were examined. It is reported in literature that factor loads for scale items should be minimum 0.30 and items below this value need to be omitted from the scale (Jak & Cheung, 2019;

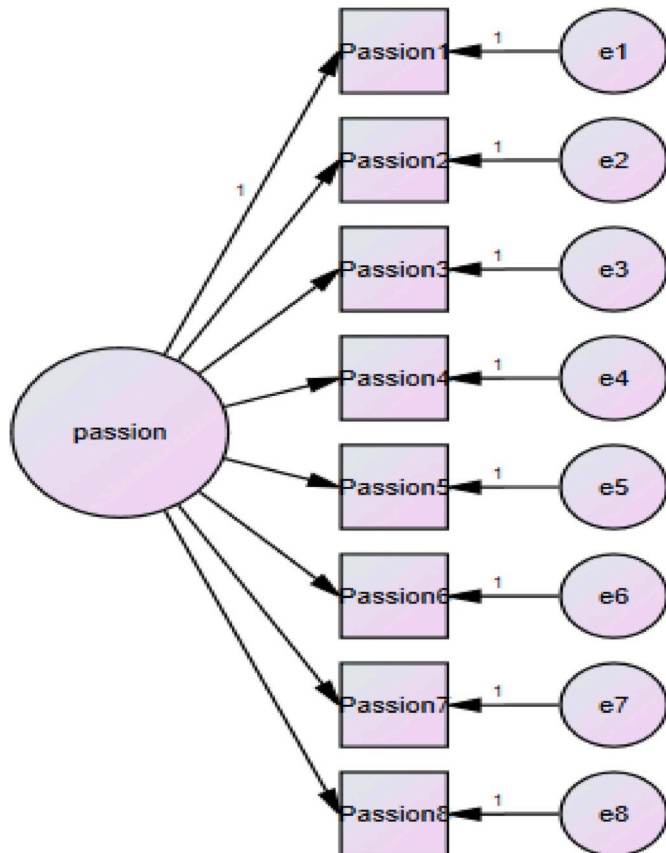


Fig. 1. Path diagram.

Xia & Yang, 2019). According to confirmatory factor analysis, Passion-Tr factor loads were found to be between 0.51 and 0.83 (Fig. 1). Thus, no items were removed from the scale. When the goodness of fit values of the model are examined; the scale was considered as within the limits of goodness of fit values because the RMSEA value was found as 0.91; chi-square value as statistically significant ( $\chi^2 = 486$ ;  $n = 155$ ,  $sd = 213.1$   $p = 0.00$ ),  $\chi^2/sd = 486/214 = 2.28$ ; CFI value as 0.945 and GFI value as 0.927. The literature suggests that, for the model to be within acceptable limits of goodness of fit,  $\chi^2/sd$  rate  $\leq 5$ ; RMSEA (root mean square error of approximation)  $\leq 0.08$ ; GFI (Goodness of Fit Index), CFI (Comparative Fit Index) and IFI (Incremental Fit Index) values need to be above 0.90 (Büyüköztürk, 2018; Xia & Yang, 2019).

Item total score correlation coefficients and Cronbach Alpha values for internal consistency of the items in the scale were calculated to determine the reliability of the scale (Table 1). It was observed that item-total score correlation coefficients are between 0.59 and 0.82. The item-total score correlation coefficients of the original scale were also stated to be between 0.51 and 0.69. Although there is no consensus in the literature regarding item-total score correlation coefficient, the minimum rate is accepted, in general, as 0.20. The items with correlation coefficient between 0.30 and 0.40 is reported as “good” and those above 0.40 are seen as “very good”(Arafat et al., 2016; Zijlmans, Tijmstra, van der Ark, & Sijtsma, 2018). The Cronbach Alpha Coefficient value of the scale was calculated as 0.864 (Table 1). In the original scale form, the Cronbach Alpha Coefficient was reported as 0.86. It is seen that the Cronbach Alpha Coefficient varies between 0.0 and 1.0 in the literature; and if the coefficient is between 0.60 and 0.80 the scale is quite reliable, and 0.80 or above is considered as highly reliable (Büyüköztürk, 2018). From this perspective, the Cronbach Alpha Coefficient value calculated in our study is in harmony with the values reported in the literature.

Another method for reliability test is the investigation of test-re-test results (Arafat et al., 2016; Büyüköztürk, 2018). The correlation coefficient calculated between the measurements done twice with the same group with certain intervals is examined and to what extent the scale reports consistent results is determined. High correlation indicates both perseverance of test scores and that there is not much change between two measurements over time (Büyüköztürk, 2018). The correlation coefficient (0.919) between the test-re-test scores of the Passion-Tr Scale was found as very high (Table 3). The correlation coefficient between the test-re-test scores during the development stage of the scale was also found as 0.92, which is very high. These findings revealed that the scale is measurement tools which is consistent over time.

There are strengths and weaknesses to this study. The Turkish validity and reliability analysis of the Passion Scale was conducted at a single university with young adults aged 18–23. This is a significant limitation of our study. Thus, it is suggested to replicate this study in different age groups. The strength of the study is that, its correlation to only Grit-S scale was observed to test the construct validity while developing Passion Scale ( $r = 0.39$ ) (Hermundur Sigmundsson et al., 2020a, 2020b, 2020c). However, in this study, its correlation to Grit-S was observed in addition to conducting exploratory and confirmator factor analysis to test construct validity.

Practical implication: The 8-item passion scale is an easy-to-use scale that can be used in relational studies related to the success of passion, the ability to fulfill the requirements of the profession, the perception of professionalism, future expectation, perseverance and mentality.

## 5. Conclusion

This study is the first study to assess the psychometric features of the 8-item Passion Scale in Turkey. The findings are consistent with the analysis results of the original scale. The EFA and CFA results indicated that the scale is single-factored. The Cronbach Alpha internal consistency coefficient, item-total correlation, test-repeat test analyses found high correlations. These results proved that Passion-Tr is a valid and reliable instrument and can be used in the assessment of overall success

grit objectively.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.newideapsych.2020.100802>.

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