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Handwriting Anxiety Scale for Turkish as a Foreign Language Learners: Validity and Reliability

ABSTRACT

This research aimed to develop a handwriting anxiety scale for students learning Turkish as a foreign language. Validity and reliability analyses were conducted on the scale developed for this purpose. At the beginning of the scale development process, an item pool consisting of 13 items was formed. In the next stage, data were collected with these items from 448 foreign students learning Turkish in the provinces of Istanbul, Erzurum, Sivas and Erzincan. The collected data underwent Exploratory Factor Analysis (EFA) using a statistical software package. Three items with factor loadings below .45 were removed. Confirmatory Factor Analysis was applied to verify the structure consisting of 10 items, which had 55.06% explained variance in a single factor. As a result of the Confirmatory Factor Analysis, fit index values were found as $\chi^2 / sd = 2.069$, SRMR = .03, RMSEA = .69, GFI = .94, AGFI = .90, CFI = .94, NFI = .95, TLI = .96. CR=.92 and AVE=.54 values were reached. In the analyses conducted for the scale's reliability, the Cronbach Alpha coefficient was .91, and with the split-half reliability method, this value was found to be .80 and .87. As a result of the analysis, it was determined that the handwriting anxiety scale for students learning Turkish as a foreign language has a high level of validity and reliability compared to the criteria values given in the literature. Therefore, this scale can be utilized in future research on handwriting anxiety in foreign language learners.

Keywords: Teaching Turkish as a foreign language, anxiety, scale development, handwriting.

Introduction

Among language skills, writing holds its unique place as a tool facilitating communication among language users for such various purposes as interacting on social media or conducting academic studies. Given its role in facilitating communication, writing is a fundamental component of overall language proficiency (Karatay, 2020), and it is to be developed at different levels of language education. Yet, the multi-dimensional nature of writing development brings the consideration of various psychomotor, cognitive, metacognitive and affective variables to the front (Olivares-Cuhat, 2010).

Koksal (2001) explains that the psychomotor aspects of writing mainly cover the development of the effective use of fine motor skills directing muscle activation and coordination, while cognitive and metacognitive dimensions require mental processing, interpretation and implementation of the language input into written output. When these processes do not work properly, students have problems with consistency of letter size, legibility,

word/letter spacing, writing speed and left margin alignment (Ghaleb, 2024). Among these variables, the affective dimension includes emotional factors such as motivation, self-efficacy, and anxiety. Within this scope, the psychomotor and affective domains are considered to be closely connected particularly at the initial stages of writing development (Al-Sawalha & Chow, 2012). In other words, successful development of the psychomotor dimension of writing is to increase motivation while problems with the beauty and legibility of writing are to increase anxiety in the process of developing writing skills.

Anxiety closely associated with and experienced in the context of language education is specified as foreign/second language learning anxiety which is under the effects of various dynamics in the process (Horwitz, 2001). The particular consideration of the complex nature of the writing skill reveals that learners may experience hesitations to express themselves in writing because of the slow progress of writing development and possible concern regarding their writing quality (Zhang, 2001). Thus, understanding learner anxiety experienced in writing development in the foreign language learning process is thought to contribute significantly to the efficiency of writing development, which is to stimulate learner motivation and writing quality.

Horwitz et al. (1986) suggest that writing anxiety mainly develops in examination contexts, which possibly creates a sense of uneasiness for learners because of being evaluated and receiving feedback regarding problematic productions. Cheng (2004) explained foreign language writing anxiety in three dimensions: Somatic anxiety (physiological effect), cognitive anxiety (cognitive aspect of anxiety experience) and avoidance behavior (avoidance of writing). These three types of writing anxiety affect students' writing processes and their behaviors in foreign language development. Though some studies proposed that a certain level of anxiety has the potential to stimulate learners' production and concentration in writing (Al-Saraj, 2011; Brown, 2000), a majority of studies pointed to the negative correlation between anxiety and writing performance (Frantzen & Magnan, 2005; Horwitz, et al., 1986; MacIntyre & Gardner, 1991; Rezaei & Jafari, 2014). These studies indicated that learners suffering from writing anxiety may experience challenges in putting their ideas effectively in writing and using appropriate language structure at the cognitive and metacognitive levels and challenges such as having illegible handwriting at the psychomotor level.

As this study is concerned with the development of a handwriting anxiety scale, it is expected to contribute to research on scale development. The perusal of the relevant literature shows that scale development regarding the anxiety variable in writing development mainly started towards the late 1990s (Cheng et al., 1999; Saito et al., 1999; Vogely, 1998). Daly and Miller (1975) developed the Writing Comprehension Test (WAT), which was adapted and developed by Young (1999) into the 26-item Foreign Language Writing Scale (FLWAS). The adapted version of the instrument has been utilized in many studies (Al-Sawalha & Chow, 2012; Huwari & Abd Aziz, 2011; Liu & Ni, 2015). Centering on the relationship between learners' foreign language writing anxiety and various aspects of learner differences, Cheng (2004) implemented the Second Language Writing Anxiety Inventory (SLWAI) to a sample of 421 Taiwanese students. This instrument has also been adapted to different languages and adopted in many studies (Ekmekci, 2018; Jebreil et al., 2015; Kirmizi & Kirmizi, 2015; Rabadi & Rabadi, 2020; Rasool et al., 2023; Sabti et al., 2019; Syarifudin, 2020; Tsiriotakis et al., 2017; Yastibas & Yastibas, 2015).

In the particular context of Turkish as a foreign language, the relevant literature also presents research on writing anxiety experienced by foreign learners of Turkish. In his study, İscan (2015) used Cheng's (2004) 22-item SLWAS (Second Language Writing Anxiety Scale) and found that foreign students learning Turkish in Jordan had high levels of somatic and social anxiety and low levels of cognitive anxiety

regarding their writing skills. As a result of the interviews, it was determined that the anxiety was caused by the students' fear of negative evaluation by their teachers, lack of self-confidence and feeling under pressure due to time limitations. To assess the writing anxiety and attitudes of a group of foreign learners of Turkish, Akbulut (2016) utilized the anxiety scale in foreign language learning developed by Daly and Miller (1975) and adapted into Turkish by Ozbay and Zorbaz (2011). The results of the analysis showed that gender and class level did not cause significant differences in the students' levels of writing anxiety and attitudes towards writing, but there were significant differences arising from the differences in their mother tongue. The results of the interviews revealed that alphabet-syntax differences and difficulty in grammar rules were the sources of the anxiety.

There are also some examples of scale development on writing anxiety in the Turkish context. One of the first writing scales to measure anxiety in teaching Turkish as a foreign language was developed by Maden et al. (2015). In the scale consisting of 26 items, the sub-dimensions were determined as individual-oriented anxiety, environment-oriented anxiety, anxiety related to the rules of written expression, anxiety related to the writing tool and form, and anxiety related to the psychology of writing. As a result of the study, it was found that the anxiety of learners of Turkish as a foreign language varies depending on their nationality, the alphabet they use and their writing habits. To measure the writing anxiety of learners of Turkish as a foreign language, Aytan and Tuncel (2015) also developed a scale which has an explained variance of 67% in 4 dimensions. Karakus-Taysi (2018) developed a 19-item scale, the Writing Anxiety Scale for Turkish as a Foreign Language, with 44.6% of the total variance explained in 3 factors. The total Cronbach Alpha reliability coefficient of the scale was calculated as .834. Taking such different variables as gender, country, length of stay in Turkey and writing habits into account, Ozdemir (2019) used this scale to examine the writing anxiety of foreign learners of Turkish. The results indicated that country differences had diverse levels of effect on the participants' writing anxiety. Sen and Boylu (2017) also developed a Writing Anxiety Scale, consisting of 3 dimensions and 13 items with an internal consistency value of .84 and an explained variance of 46.8%. Baris (2019) used this scale in their study and stated that gender and frequency of reading Turkish books did not have a significant effect on foreign students' writing anxiety while there was a significant difference in the frequency of writing in Turkish.

Given the content and scope of the existing writing scales, it can be concluded that they mostly include items related to anxiety experienced in the development of writing skills or writing production. However, foreign language learners may

also have problems with elements such as letter size consistency, legibility, word and letter spacing in handwriting (Ghaleb, 2024). In this context, it was determined that there is a need to develop a scale for the anxiety experienced in the early stages of writing development in relation to the psychomotor dimension.

In the study conducted by Yaman (2010), an analysis was conducted of the scores obtained by students in relation to their writing anxiety. This analysis was undertaken using a one-way analysis of variance (ANOVA), with the results indicating a significant difference at the 0.05 level, according to the legibility of the students' handwriting. The results revealed that students with poor handwriting had more writing anxiety than students with neat handwriting. Thus, on the results of Yaman (2010) study, it can be concluded that the quality of handwriting in terms of its legibility is a point of consideration in writing anxiety scales. In a similar vein, Maden et al. (2015) and Ozdemir (2019) found that Turkish students had less writing anxiety than their peers from other countries using a different alphabet than the Latin script. These studies indicate that alphabetical differences between the mother tongue and the target language can turn into a source of anxiety in writing development, particularly considering its psychomotor dimension. These considerations have paved the way for this study aiming to develop a handwriting anxiety scale that basically covers the psychomotor dimension of writing. Thus, with an aim to contribute to the literature, the developed scale is thought to help instructors/researchers understand initial sources of anxiety experienced by foreign learners of Turkish.

Purpose of the Study

The aim of this research is to develop a handwriting anxiety scale for Turkish as a foreign language learners.

Method

Research Model

This is a scale development study. In this context, this section presents information about the stages of the scale development. The measures and analyses followed for validity and reliability in the scale development process are explained step by step.

Study Group

The study group of the research consists of foreign students who learn Turkish at TÖMER's (Turkish Teaching and Application Center) in İstanbul, Erzurum, Sivas and Erzincan provinces, in Turkey. A total of 448 students were reached during the data collection process. According to Tabachnick and Fidell (2015), an ideal sample size for scale development studies ranges between 300 and 500 participants. Comrey and Lee (1992) consider 100 participants as poor, 200 as

average, 300 as good, 500 as very good and 1000 as excellent for scale development. On the number of participants, Bryman and Cramer (2001) suggest that the number of participants should be at least five times the number of the items in the prepared scale while Nunnally (1978) stated that it should be ten times. In the draft form of the scale, 13 items were included in the sample. In the extant literature, scales comprising a limited number of items are reported to provide practical measures and to be valid and reliable instruments (Jansen 2024; Rammstedt & Beierlein 2014). Thus, according to the criteria referred in the literature, it can be said that the study group consisting of 448 students is sufficient for 13 items.

In sample selection, maximum diversity sampling, one of the purposive sampling methods, was utilized. The maximum diversity sampling method is used when providing sample diversity representing the problem or the main variable is necessary. In this study, diversity in terms of gender, age, and the alphabet used in the mother tongue was the criteria for participant selection. Maden et al. (2015) reported that alphabet differences affected writing anxiety and the gender variable was found to be insignificant. On the other hand, in the review study of Polatcan (2019), it was reported that there were different results regarding the gender and age variables being significant and insignificant in studies on anxiety in teaching Turkish as a foreign language. Thus, in line with the literature, the sample was selected according to the variables examined in general writing anxiety studies. Information about the sample is given in the table 1.

Table 1.

Demographic Characteristics of the Study Sample (EFA and CFA Groups)

Categorical Variables		EFA (n)	CFA (n)
Gender	Woman	75	85
	Male	145	143
Age	18-25	188	201
	25-30	23	18
	30-35	8	7
	40+	1	2
Alphabet used in the mother tongue	Latin	59	53
	Cyrillic	41	31
	Georgian	1	-
	Arabic	118	143
	Burmese	1	1

The data collected for exploratory and confirmatory factor analyses were divided into two. The data collected according to the categorical variables were tried to be divided equally. The data were collected from 75 female and 145 male students for EFA and 85 female and 143 male students for CFA. The ages of the students were selected in the range of 18-25, 25-30, 30-35 and 40+, and students using the Latin alphabet, Cyrillic alphabet, Georgian alphabet, Arabic alphabet and Burmese alphabet in their

mother tongue were included.

Data Collection Tool

The study describes the process of developing a data collection tool. In this context, permission was obtained from the ethics committee to collect data from students. The ethical process in the study was as follows:

- Ethics committee approval was obtained from Atatürk University Education Sciences Ethics Committee (Date: 13.04.2021, 2021, Number: E-56785782-050.02.04-2100107254)
- Informed consent has been obtained from the participants.

Scale Development and Analysis Phase

Before writing the items of the scale, a literature review on foreign language anxiety and writing skills was conducted, and a pool of 17 items was created. The scale items were revised by taking the opinions of 5 experts from the Departments of Turkish Language and Literature Education, Turkish Language Education and Measurement and Evaluation. These experts consisted of academicians with at least a PhD degree. 4 items were removed in line with the expert opinions, and the other items were revised and made ready for pilot application. The 13-item scale form was organized as a seven-point Likert-type scale form to increase the sensitive range. A pilot application was conducted with 10 students at A2 level to evaluate the comprehensibility of the scale by the students. After the pilot application, 3 items were simplified and the expression was shortened. In the pilot application, the process lasted for 36 minutes for the participant who responded to the items the slowest and 10 minutes for the fastest participant. Thus, an average of 23 minutes was reported to be the response time of the scale.

After the pilot application, the 13-item scale form was sent to TÖMER's in İstanbul, Erzurum, Sivas and Erzincan and applied to foreign learners of Turkish on a voluntary basis. The data collected from 448 students were divided into two parts for EFA and CFA analyses. Exploratory Factor Analysis was conducted on 220 students. Referred to by Pallant (2017) as a data reduction process, factor analysis is based on the principle of identifying related variables and reducing them to more general structures or dimensions (Aksu et al. 2017). According to Buyukozturk (2002), exploratory factor analysis is an analysis aiming at finding factors and generating theories based on the relationships between variables (Buyukozturk, 2002). Thus, used in the first stage of scale development, exploratory factor analysis is followed to determine many features that cannot be observed or measured directly. In this scale development study, exploratory factor analysis was performed using the

statistical package program (SPSS 27.0) to identify the factors of the 13-item scale. Based on the outputs obtained as a result of the analysis, the processes of item extraction and determining the number of dimensions of the scale are explained in detail in the findings section.

To test/verify the factor structures discovered in the exploratory factor analysis, confirmatory factor analysis was applied. Confirmatory Factor Analysis is based on the verification of models whose factorial structure is already known and testing the assumed relationships in a different data set (Gurbuz, 2021). To test and verify the scale model that emerged in EFA using different samples with similar characteristics, the analysis was performed using SPSS AMOS 20.00 software. The interpretation of the models tested at the end of confirmatory factor analysis and the outputs obtained from the models, fit indices and explanations regarding the modifications applied are presented in the findings section.

Results

In this section of the study, the results of the validity and reliability analyses conducted with SPSS and AMOS programs are given.

Construct Validity Analysis

Before the analysis, it was determined that the items in the data set showed normal distribution. Since there were no reversed items in the scale, no item reversal process was applied. Before the analysis, the correlation matrix was examined and it was seen that the lowest correlation between the items was .35 and the highest was .67. In factor analysis, a good level of relationship between variables is expected (Karagoz, 2021). The current values show that the relationship between the items is at a sufficient level.

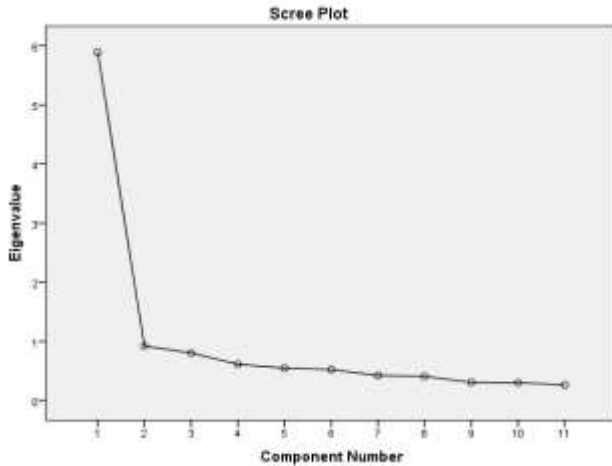
The results of the KMO (Kaiser Mayer Olkin) and Barlett Sphericity Test, which are prerequisites for exploratory factor analysis, indicated that the data set was suitable for factor analysis. A KMO value of more than 60 indicates that the sample size is suitable for factor analysis (Tabachnick & Fidell, 2015). The KMO value obtained as a result of the analysis was 0.91. The results of Barlett's test of sphericity were significant at a 99% confidence interval ($\chi^2 = 1121,863$ df= 45, $p = .00$). In line with the results obtained from the Barlett Sphericity Test, the exploratory factor analysis was conducted.

According to the principal component analysis, it was found that the handwriting anxiety scale for learners of Turkish as a foreign language has only one factor with eigenvalues above 1. According to the Kaiser criterion, factors with values of 1.0 and above are considered as dimensions of the scale (Pallant, 2017). According to these

results, the scale has 55.06% explained variance in a single factor. A total explained variance value between 40% and 60% is considered sufficient in social sciences studies (Scherer et al., 1988). The 10-item scale exceeded the value specified in the literature in a single dimension.

Figure 1.

Scree Plot Graphic



Another method used to infer the number of dimensions of the scale is the scree plot. Sencan (2014) explains that the dimensions are accepted to the point where the break is horizontal and stationary in the scree plot. Fields (2005) states that factors with low and high eigenvalues have a characteristic shape in the graph. When the scree plot in Figure 1 is analyzed, it is seen that the break ends at the first dimension and accordingly, the scale has a one-factor/dimensional structure. The factor loadings of the items in a single dimension in the scale are given in Table 2.

Table 2.

Exploratory Factor Analysis Factor Loadings

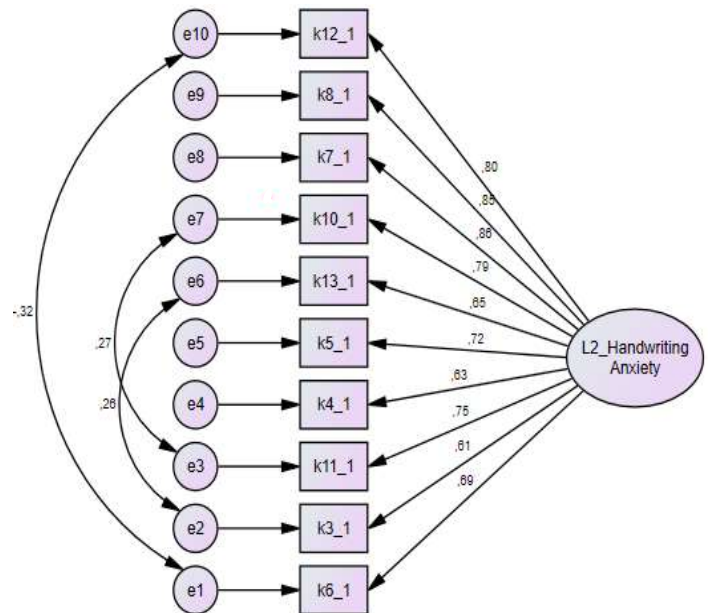
Item No	Factor Load
k12	.817
k8	.799
k7	.757
k10	.739
k5	.731
k11	.731
k13	.725
k4	.717
k6	.709
k3	.686

Table 2 shows the factor loadings of the items of the scale. Buyukozturk (2019) states that factor loadings should not fall below .45. According to Comrey and Lee (1992), factor loadings above .63 (40% overlapping variance) are considered very good, and loadings exceeding .71 (50% overlapping variance) are considered excellent. In this

context, items 1, 2 and 9, which were below .45, were removed from the draft scale form consisting of 13 items, leaving 10 items. When the factor loadings of the items in Table 3 are analyzed, it can be stated that they are between .68 and .81 and the values are at very good and excellent levels. As a result of the exploratory factor analysis, a structure consisting of 10 items and a single dimension was obtained for the handwriting anxiety scale for learners of Turkish as a foreign language. This structure was checked with confirmatory factor analysis in the next step. Figure 2 shows the path diagram obtained as a result of the confirmatory factor analysis.

Figure 2.

Path Diagram



In the normality assumption before the analysis, it was determined that there was no violation of the normal distribution since the kurtosis and skewness values were in the range of $-1 + 1$ and the critical values were in the range of $-3 + 3$ (Gurbuz, 2021). As a result of confirmatory factor analysis, it is seen in Figure 1 that the factor loadings of the items are between .61 - .86. In this context, there was no need to remove any item depending on the factor loadings. In the CFA analysis, the recommended fit indices are examined to determine the suitability of the established model (Ozdamar, 2017). The general values for fit indices are χ^2/sd , GFI, CFI, RMSEA, but there are also studies that include other values (Karagoz, 2021). Table 4 shows the fit indices based on the suggestions of Erkorkmaz et al. (2013) and Schermelleh-Engel and Moosbrugger (2003) and the values obtained from the model.

Table 3.*The Fit Indexes of the CFA*

Indexes	Reference Values		Measurement	Conclusion
	Good fit	Acceptable Compliance		
χ^2/sd	>3	>5	2.069	Good Fit
GFI	> .90	> .85	.94	Good Fit
AGFI	> .90	> .85	.90	Good Fit
CFI	> .95	> .90	.94	Good Fit
RMSEA	> .05	> .10	.69	Acceptable Compliance
SRMR	> .05	> .10	.03	Good Fit
NFI	> .95	> .90	.95	Good Fit
TLI	> .95	> .90	.96	Good Fit
AVE= .54 (> .50)				
CR= .92 (Composite Reliability > .70)				

As a result of the CFA analysis, fit indices values were found to be " $\chi^2 / sd = 2.069$ SRMR= .03, RMSEA= .69, GFI= .94, AGFI= .90, CFI= .94, NFI= .95, TLI= .96". It was determined that the values for the fit indices of the tested model were in accordance with the criteria in the literature. The composite reliability (CR) value is used as an alternative to Cronbach's alpha value and is expected to be above 0.70. The value obtained from the average variance explained (AVE) is expected to be less than the CR value and greater than .50 (Yaslioglu, 2017). It is seen that the CR and AVE values meet these criteria. In line with the outputs obtained from the CFA, it can be stated that the construct validity of the scale is supported and the findings obtained from the EFA are confirmed.

Reliability Analysis

Cronbach Alpha coefficient was used to analyze the internal consistency of the scale items. The split-half method, one of the reliability analyses, was also used. The values obtained are given in Table 4.

Table 4.*Reliability Values*

	Handwriting Anxiety Scale
Cronbach's Alpha	.91
Split Half	.80 (part 1) .87 (part 2)

Cronbach's Alpha coefficient was calculated to assess the internal consistency of the scale items, yielding a value of .91, which indicates excellent reliability (DeVellis, 2012). When the scale was divided into two, the reliability level did not fall below .70. Hence, it can be stated that the reliability of the scale is at a sufficient level according to the threshold value in the literature.

Item analysis was performed to determine whether the items of the scale were distinguishing or not. The extent to which the items function in line with the objectives of the scale is tried to be determined by item analysis, and the distinctiveness of the items is tried to be measured by item analysis based on sub-upper groups (Karagoz, 2021). Item-total correlations and item analysis based on sub-superior groups are given in Table 5.

Table 5.*Item Total Correlations and Item Analysis Based on Lower-Upper Groups*

Item	\bar{X}	sd	r	a (if item deleted)	t
k3	3.45	2.19	.589**	.907	-19.639**
k4	3.15	2.08	.625**	.905	-18.342**
k5	3.05	1.95	.616**	.905	-20.357**
k6	3.35	2.11	.636**	.904	-22.246*
k7	2.96	1.92	.698**	.901	-21.091*
k8	3.15	2.02	.698**	.900	-24.423*
k10	2.99	1.98	.736**	.898	-22.114*
k11	3.12	2.02	.724**	.899	-24.485*
k12	3.25	2.07	.744**	.897	-27.808*
k13	3.03	2.09	.696**	.900	-24.448*

In the item-total correlation analysis, the low correlation with the total of the items indicates that the contribution of the item to the composite scale is low (Ozdamar, 2017). When Table 5 was analyzed, it was decided that it was appropriate to keep the items in the scale since the correlation coefficients were higher than .20 and did not take negative values (Karagoz, 2021). In this context, since item removal would decrease Cronbach's alpha coefficient, it was concluded that each of the scale items was necessary for the scale. In addition, a significant level of difference was found for the lower and upper groups of items k3, k4, k5, k6, k7, k8, k10, k11, k12 and k13 ($p = .00$). The significant difference obtained from the item distinctiveness analysis indicates that the items are distinguishing. According to the above findings, all items used have distinguishing properties.

Discussion

Within the scope of this study, a handwriting anxiety scale was developed for learners of Turkish as a foreign language. EFA and CFA analyses were used for the construct validity of the measurement tool. As a result of Exploratory Factor Analysis, a unidimensional structure with 10 items was obtained. The KMO value was .91 and Barlett test was found to be significant at a 95% confidence interval. The scale has an explained variance rate of 55.06% in one dimension. To test the model obtained in the EFA,

Confirmatory Factor Analysis was applied with similar characteristics but with data collected from a different sample. In the CFA model, item factor loadings were between 0.61-0.86. The fit indices $\chi^2 / df = 2.069$, SRMR= 0.03, RMSEA= 0.69, GFI= .94, AGFI= .90, CFI= .94, NFI=0.95, TLI= 0.96 were found to be of good fit and acceptable fit. In the reliability analysis, Cronbach Alpha internal consistency coefficient of the scale was found to be .90. The data obtained from item-total correlations and item analyses based on sub-superior groups showed that the discrimination of the items and the contribution of the items to the composite scale were high. Finally, as a result of the Tukey test to determine whether the scale could be analyzed with a total score, the significance was obtained at the .00 level. Although the anxiety level is scored between 1-7, the maximum score that can be obtained in the final scale form resulting from the analyses is 70.

The relevant literature presents examples of scale development studies on foreign language writing anxiety and different sub-dimensions have been reached. Cheng (2004) classified writing anxiety as somatic anxiety (physiological effect), cognitive anxiety (cognitive aspect of anxiety experience) and avoidance behavior (avoidance of writing) in his inventory. Maden et al. (2015) found sub-dimensions such as individual- oriented anxiety, environment-oriented anxiety, anxiety related to the rules of written expression, anxiety related to the writing tool and form, and anxiety related to the psychology of writing. In Cheng's (2004) study, the physiological and cognitive aspects of anxiety were separated, and the avoidance behavior developed as a result of anxiety was also included in the sub-dimensions, while Maden et al. (2015) identified the internal and external sources of anxiety as the dimensions of writing anxiety in teaching Turkish as a foreign language. In Maden et al.'s (2015) study, one of the dimensions of the writing tool is related to handwriting in terms of form-related anxiety, which can be considered similar to the scope of this study. However, the detailed perusal of the literature on scale development reveals the need for a handwriting scale with a particular focus on the psychomotor dimension of writing development in language education. This study contributes to the literature by introducing a handwriting anxiety scale that specifically addresses the psychomotor aspects of writing development in foreign language learners.

Conclusion and Recommendations

The handwriting anxiety scale, developed to measure the handwriting anxiety of students learning Turkish as a foreign language, has a high level of validity and reliability according to the criterion values given in the literature. Future research can use this scale in longitudinal studies to monitor changes in handwriting anxiety over time and at

different proficiency levels. In addition, the scale can be used as a measurement tool in descriptive, correlational and experimental studies in the field of teaching Turkish to foreigners.

Ethics Committee Approval: Ethics committee approval was obtained from Ataturk University Education Sciences Ethics Committee (Date: 13.04.2021, E-56785782-050.02.04-2100107254)

Informed Consent: Written informed consent was obtained from the students participating in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Literature – 1st and 4th authors, writing introduction 1st, 2nd-4th authors, writing scale items-1st, 2nd and 3rd authors, data collection and/or processing-2st and 3rd authors, analysis and/or interpretation-3rd authors, discussion and conclusion-1st, 2nd 3rd and 4th authors, sources 2nd and 3rd authors.

Conflict of Interest: The authors have no conflicts of interest to declare.

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Appendix 1. Handwriting Anxiety Scale for Turkish as a Foreign Language Learners

Yabancı Dil Olarak Türkçe El Yazısı Kaygı Ölçeği								
<p>Sevgili Katılımcılar,</p> <p>Bu ölçek yabancı dil olarak Türkçe öğrenenlerin el yazısına ilişkin kaygı düzeylerini ölçmek amacıyla oluşturulmuştur. Lütfen cümlelerin size uygunluğuna göre 1-7 arasında puan veriniz.</p> <p>Puanlamada 1 (kesinlikle katılmıyorum) en düşük, 7 (kesinlikle katılıyorum) en yüksek puandır.</p> <p>Lütfen maddeleri içtenlikle ve size en uygun gelen şekilde yanıtlayınız.</p> <p>Katılımınız için teşekkür ederiz.</p>								
1.	El yazımın kıyaslanması beni rahatsız eder.	①	②	③	④	⑤	⑥	⑦
2.	El yazımın eleştirilmesi beni tedirgin eder.	①	②	③	④	⑤	⑥	⑦
3.	El yazımın değerlendirilmesi beni panikletir.	①	②	③	④	⑤	⑥	⑦
4.	Türkçe harflerle yazmak beni endişelendirir.	①	②	③	④	⑤	⑥	⑦
5.	Türkçe alfabeyle yazmaktan çekinirim.	①	②	③	④	⑤	⑥	⑦
6.	Sınavlarda el yazısı kullanacağım zaman paniklerim.	①	②	③	④	⑤	⑥	⑦
7.	El yazımın okunamaması beni rahatsız eder.	①	②	③	④	⑤	⑥	⑦
8.	Türkçe karakterleri yanlış yazmaktan korkarım.	①	②	③	④	⑤	⑥	⑦
9.	Tahtaya el yazısı ile yazmaktan çekinirim.	①	②	③	④	⑤	⑥	⑦
10.	Türkçede büyük-küçük harfleri yanlış yazmaktan korkarım.	①	②	③	④	⑤	⑥	⑦